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

August 31, 2010

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

SUBJECT: NRC URANIUM-ALUMINUM PROCESS LINE AND BUILDING 301 COLUMN DISSOLVERS RESTART READINESS ASSESSMENT TEAM REPORT NO. 70-143/2010-008

Dear Mr. Amerine:

On January 7, 2010, the Nuclear Regulatory Commission (NRC) issued Confirmatory Action Letter 2-2010-001 (ML100070118) in response to your letter dated December 30, 2009 (ML093641023). Your letter contained additional actions (commitments) to ensure that the root causes of the October 13, 2009, process upset had been adequately evaluated and appropriate corrective actions have been implemented for all potentially affected processes before you resumed operations of those processes.

The Restart Readiness Assessment Team was established to assure that the "Actions Prior to Restart of Operations," which you identified in your December 30, 2009 letter were satisfactorily completed. The team also evaluated whether your actions adequately addressed the four management issues identified in the Confirmatory Action Letter. These issues involved the adequacy of Nuclear Fuel Services' (NFS') management oversight of facility process changes, perceived production pressures, lack of questioning attitude by workers and management, and poor communications. Additionally, the team assessed your readiness to restart the uranium-aluminum process line and the building 301 column dissolvers through a detailed review of procedures, maintenance, design bases, the corrective action program, and management oversight initiatives. The team conducted its inspection activities from June 21 through June 30, 2010. The enclosed report documents the inspection results which were discussed with you and other members of your staff in a public exit meeting on August 3, 2010, in Erwin, TN.

The team determined that the fifteen "Actions Prior to Restart of Operations" contained in the Confirmatory Action Letter were satisfactorily completed as they pertained to the uranium-aluminum process line and the building 301 column dissolvers. During this assessment, the team did not identify any safety or risk significant issues that would preclude a safe startup of the uranium-aluminum process line and the building 301 column dissolvers. On June 29, 2010, the NRC received the second independent safety culture assessment report full-filling the requirements of the February 2007 Confirmatory Order. Upon receipt, the NRC conducted a review of the report and determined no new or uncorrected safety issues were identified that would preclude the safety start-up of the uranium-aluminum process line and the building 301

column dissolvers. Therefore, by letter dated July 6, 2010 (ML101870634), the Region II Regional Administrator authorized restart of these processes.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, and its enclosure not otherwise withheld from public disclosure will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html.

Should you have any questions concerning this inspection, please contact Steven J. Vias at 404-997-4560.

Sincerely,

/RA/

Anthony T. Gody, Director
Division of Fuel Facility Inspection

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

Enclosure:
NRC Inspection Report No. 70-143/2010-008

cc w/encl:
Timothy Lindstrom
Vice President, Operations
Nuclear Fuel Services, Inc.
Electronic Mail Distribution

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

Debra Shults
Acting 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

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

(cc w/encl: cont'd)
Gregg Lynch
Mayor
Unicoi County
P.O. Box 169
Erwin, TN 37650

Johnny Lynch
Mayor
Town of Unicoi
Unicoi, TN 37692

Distribution w/encl:
PUBLIC
T. Gody, RII
E. Cobey, RII
J. Weil, OCA
S. Vias, RII
G. Smith, RII
M. Crespo, RII
M. Chitty, RII
R. Trojanowski, RII
M. Tschlitz, NMSS
P. Habighorst, NMSS
K. Ramsey, NMSS
R. Hannah, RII
Webwork.resource@nrc.gov (NFS website)
nmed@inl.gov

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OFFICE	RII:DFFI					
SIGNATURE	SV 8/27/10					
NAME	SVias					
DATE						
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U.S. NUCLEAR REGULATORY COMMISSION

REGION II

RESTART READINESS ASSESSMENT TEAM

Docket No.: 70-143

License No.: SNM-124

Report No.: 70-143/2010-008

Licensee: Nuclear Fuel Services, Inc.

Location: Erwin, Tennessee 37650

Dates: June 21 - 30, 2010

Team: M. Crespo, Senior Fuel Facility Inspector, Division of Fuel Facility Inspection (DFFI) (Team Leader)
C. Cramer, Fuel Facility Inspector, DFFI
O. Lopez, Fuel Facility Inspector, DFFI
S. Subosits, Senior Resident Inspector, DFFI

Approved by: Steven J. Vias, Chief
Fuel Facility Inspection Branch 1
DFFI

Enclosure

EXECUTIVE SUMMARY

NRC Inspection Report No. 70-143/2010-008

The purpose of the Restart Readiness Assessment Team was to evaluate the completion of Nuclear Fuel Services' (NFS') actions associated with the January 7, 2010, Confirmatory Action Letter and assesses NFS' readiness to restart the uranium-aluminum process line and building 301 column dissolvers. The team also inspected the effectiveness of NFS' corrective actions for management oversight of facility process changes, perceived production pressures, lack of questioning attitude by workers and management, and poor communication with a focus on the readiness to restart these processes. In addition, the team reviewed procedures, maintenance records, design bases of select accident sequences, corrective action program, and management oversight initiatives. The Restart Readiness Assessment Team conducted these reviews from June 21 through June 30, 2010.

The team determined that NFS had adequately completed the fifteen "Actions Prior to Restart of Operations" contained in the Confirmatory Action Letter as they pertained to the uranium-aluminum process line and the building 301 column dissolvers. The team also concluded that NFS' corrective actions related to management oversight, perceived production pressure, lack of questioning attitude, and poor communication were reasonable and had a sufficient likelihood of being effective to support a determination that NFS could safely startup and operate these processes. During this assessment, the team did not identify any safety or risk significant issues that would preclude a safe startup of these process lines.

Attachment:
Key Points of Contact
List of Items Opened Closed and Discussed
List of Procedures Reviewed
List of Acronyms

REPORT DETAILS

BACKGROUND

On October 13, 2009, an unexpected exothermic reaction (Event Number 45446) occurred within the uranium-aluminum processing portion of the Blended Low Enriched Uranium (BLEU) Prep Facility (BPF) at NFS in Erwin, TN. The NRC chartered an Augmented Inspection Team (AIT) in October 2009, to review the circumstances surrounding the event. In December 2009, based on preliminary results from the AIT, the NRC undertook a review of NFS' operations and performance dating back to the issuance of a Confirmatory Order in February 2007. On the basis of the interim review of NFS' performance, the NRC determined that additional actions needed to be taken by NFS to provide reasonable assurance that the NFS facility could be operated safely.

The NRC engaged the management of NFS with the results of this interim assessment and obtained a commitment from NFS to maintain the facility process lines shutdown until certain specific actions were completed. The licensee submitted its commitments in writing by letter dated December 30, 2009 (ML093641023). The NRC confirmed these commitments in Confirmatory Action Letter (CAL) No. 2-2010-001, dated January 7, 2010 (ML100070118). Following an inspection of NFS' readiness to restart, the NRC authorized the Navy fuel and uranium-metal/oxide lines to restart on March 23, 2010 (ML100820047) and May 19, 2010, respectively (ML101390388).

By letter dated June 11, 2010 (ML1022380128), NFS notified the NRC of its readiness to restart the uranium-aluminum and the building 301 column dissolver process lines. This line consisted of the uranium-aluminum dissolution system, centrifuge bowl cleaning station, size reduction glove box, and the building 301 column dissolvers. The NRC conducted inspection activities at NFS from June 21 to 25, 2010, and additional in-office follow-up. On June 30, 2010, the NRC completed its inspection of the licensee's readiness to restart the uranium-aluminum process line. On June 29, 2010, the NRC received the second independent safety culture assessment report full-filling the requirements of the February 2007 Confirmatory Order. The NRC conducted a review of the report and determined no new or uncorrected safety issues were identified that would preclude the safety start-up of the uranium-aluminum process line and the building 301 column dissolvers. Therefore, by letter dated July 6, 2010 (ML101870634), NRC authorized start up of the processes.

Inspection Scope

On June 21, 2010, the NRC dispatched a team of four team to evaluate NFS' readiness to restart the uranium-aluminum process line and the building 301 column dissolvers. The objectives of the inspection were to:

- Assure that the "Actions Prior to Restart of Operations" were satisfactorily completed.
- Verify that the licensee's assessment and corrective actions adequately addressed the concerns involving the adequacy of NFS' management oversight of facility process changes, perceived production pressures, lack of questioning attitude by workers and management and poor communication.
- Assess the licensee's readiness to restart the uranium-aluminum process line and the building 301 column dissolvers.

A. ACTIONS PRIOR TO RESTART OF OPERATIONS

1. The restriction NFS management put in place following the Bowl Cleaning Station (BCS) Incident prohibiting the processing of granular metallic "fines" in the Uranium-Aluminum process will be institutionalized.

This corrective action was reviewed during the Navy Fuel line readiness inspection (documented in Inspection Report 70-143/2010-005 (ML101530164)). The NRC determined that the restriction NFS management put in place prohibiting the processing of granular metallic "fines" in the uranium aluminum process was properly institutionalized. Subsequent review during this uranium-aluminum process and building 301 column dissolvers restart readiness assessment re-confirmed that the prohibition was properly institutionalized.

2. NFS will institutionalize improvements to the change control process, which was delineated in a temporary procedure. Training on the process will be provided to appropriate operations, technical, oversight and management staff.

During the Navy Fuel line and the uranium-metal/oxide line readiness inspections, the NRC reviewed the licensee's corrective actions to improve the change control process to address the problems identified from the BCS event and concluded that the licensee had adequately identified and institutionalized improvements into their plant-wide change control process procedure.

During this uranium-aluminum process line and building 301 column dissolvers readiness inspection, the team reviewed documentation of work activities and modifications that were completed while the facility was shutdown to ensure the work was completed in accordance with recently enhanced modification process procedures. The team determined that Enterprise Change Requests (ECRs) and technology review documents selected for review were prepared in accordance with the newly enhanced process change procedures and contained the appropriate level of detail and technical basis documentation to allow for thorough licensee reviews.

No new observations were made during the uranium-aluminum process line and the building 301 column dissolvers inspection to alter the conclusions from the Navy Fuel line and uranium metal/oxide line readiness inspections.

3. The incident investigation, including detailed causal analysis, of the BCS Incident will be completed.

During the Navy Fuel line readiness inspection, the NRC reviewed the licensee's initial Root Cause Analysis (RCA) investigation report of the BCS event and interviewed several members of the investigation team. The NRC evaluated whether the level of detail of the investigation was commensurate with the significance of the problem, included consideration of prior occurrences of the problem and knowledge of prior operating experience, addressed the extent of condition and extent of cause, and appropriately considered the safety culture components of the problem. The team concluded that the licensee completed an adequate root cause analysis of the BCS event that involved techniques and methodologies generally consistent with expected investigation practices.
No new observations were made during the uranium-aluminum process line and the building 301 column dissolvers inspection to alter the conclusions from the Navy Fuel line readiness inspection.

4. The near-term corrective actions needed to address the causal factors identified by the investigation of the BCS incident will be determined and implemented.

During the Navy Fuel line readiness inspection, the team reviewed the licensee's corrective actions identified from the RCA investigation of the BCS event. The NRC verified that appropriate near-term corrective actions were specified for each causal factor with due dates commensurate with the significance of the issue. The team concluded that the licensee determined and implemented near-term corrective actions to address the causal factors identified by the investigation of the BCS incident.

During the uranium-aluminum process line and the building 301 column dissolvers inspection, the team made observations of the effectiveness of the implementation of corrective actions. One of the corrective actions reviewed was the implementation of the revised Configuration Management Program which provided a technical basis with sufficient detail for hazards analysis. The team conducted a detailed review of five recent technology review documents involving modifications associated with the uranium-aluminum process line to ensure they were conducted in accordance with the guidance in procedures NFS-CM-004, "NFS Change Control Process," Revision (Rev.) 4 and NFS-TS-009, "Configuration Management of Process Change," Rev. 2. The team determined that the documents were completed in accordance with licensee procedures and each provided adequate technical basis documentation to allow for a thorough review of the process changes by licensee personnel.

No new observations were made during the uranium-aluminum process line and the building 301 column dissolvers inspection to alter the conclusions from the Navy Fuel line readiness inspection.

5. The extent of condition reviews of process area safety basis conducted after the BCS incident will be expanded to include the BPF Uranium-oxide Dissolution Process.

This item was evaluated in detail during the Navy Fuel line inspection by reviewing the revised extent of condition analysis described in NFS Investigation Problem Identification, Resolution, and Correction System (PIRCS) #I10389. The NRC verified that any associated safety assumptions and controls matched the field conditions. Additionally, the team assessed the licensee's review of the associated criticality, radiological, chemical and fire safety basis documents (including setpoints and periodic tests) for the uranium-oxide system.

The NRC concluded that the extent of condition reviews were very detailed and evaluated many of the vulnerabilities of the uranium-oxide system. The team determined that the licensee adequately completed an extent of condition review to include the uranium-oxide dissolution process.

No new observations were made during the uranium-aluminum process line and the building 301 column dissolvers inspection to alter the conclusions from the Navy Fuel line and uranium metal/oxide readiness inspections.

6. An extent of cause analysis for each causal factor will be completed and specific interim corrective actions will be identified and implemented as appropriate.

The licensee completed an extent of cause analysis for each causal factor identified in their root cause evaluation. The Navy Fuel line readiness inspection determined that the extent of cause was applied to all processes which included those systems in uranium-metal/oxide process line. The team concluded that the licensee effectively conducted an extent of cause analysis for each causal factor and identified and implemented appropriate interim corrective actions. During the uranium-metal/oxide process line inspection, the team made further evaluations of the identified causal factors as they related to the uranium-metal/oxide process line including implementation of NFS-TS-009 and rigor of Technical Basis documentation. These same corrective actions were also reviewed as part of this uranium-aluminum process line and building 301 column dissolvers readiness inspection.

No new observations were made during the uranium-aluminum process line and the building 301 column dissolvers inspection to alter the conclusions from the Navy Fuel line and uranium metal/oxide readiness inspections.

7. Each facility accident scenario involving nitrogen compound gas (NO_x) generation will be re-evaluated to ensure appropriate items relied on for safety (IROFS) have been identified and implemented to provide adequate protection and that management measures for those IROFS are sufficient to ensure these IROFS are available and reliable to perform their intended safety function when needed.

During the Navy Fuel line and the uranium-metal/oxide readiness inspections, the NRC performed a review of NO_x accident scenarios and verified that adequate IROFS and associated management measures were in place to ensure compliance with the requirements of Title 10 of the *Code of Federal Regulations* (10 CFR) 70.61, Performance Requirements. The NRC concluded that the licensee had effectively conducted a review of NO_x generating scenarios and identified appropriate IROFS with associated management measures.

During the uranium-aluminum process line and building 301 column dissolvers inspection, the team reviewed accident sequences associated with risk significant uranium-aluminum process line systems and the building 301 column dissolvers. The team assessed the licensee's methodology for accident sequence evaluations and noted that the licensee had adequately applied the lessons learned from the uranium-metal/oxide readiness assessment. The assessment concluded that IROFS were adequately identified and implemented. In addition, the team verified that adequate management measures were implemented to ensure the designated IROFS could perform their intended safety function.

No new observations were made during the uranium-aluminum process line and the building 301 column dissolvers inspection to alter the conclusions from the Navy Fuel line and uranium metal/oxide readiness inspections.

8. Following completion of restart actions, NFS will have an independent review conducted to verify implementation of the restart actions. Personnel participating in these reviews will have no responsibility for the conduct or oversight of NFS operations.

This item was reviewed comprehensively during the Navy Fuel line inspection. NFS conducted an independent review to verify the implementation of the restart actions. The NRC team

concluded that the Independent Review Team had a good approach to sample the items, but the review lacked the depth needed to ensure that the corrective actions taken were well above the minimum.

No new observations were made during the uranium-aluminum process line and the building 301 column dissolvers inspection to alter the conclusions from the Navy Fuel line and uranium metal/oxide readiness inspections.

9. NFS will allow sufficient time for NRC to perform inspections of restart actions. The NRC will be provided with a two-week notice prior to the time NFS management would like for the NRC team to arrive at the NFS site.

On June 11, 2010, Mr. Amerine, President of NFS, issued a letter to Mr. Reyes, NRC Region II Administrator, requesting NRC review of the uranium-aluminum process line and the building 301 column dissolvers.

10. Implement a Senior Engineering Watch (SEW), to provide additional technical coverage on the process floor. The SEW will have the sole duty of providing independent technical oversight of process operations to promote the identification, adjudication and resolution of potential safety concerns. The SEW will functionally report to the Vice President (VP) of Operations. NFS will maintain this watch for a minimum period of 6-months after restart of all operations.

During the Navy Fuel line inspection, the NRC reviewed the licensee's procedures for implementation of the SEW, which were contained in licensee standing order, NFS-SO-09-006, "Enhanced Operations, Management and Communications," and interviewed the SEWs, operating staff, and management. The team concluded that the licensee had put in place appropriate processes, procedures, and personnel to effectively implement the SEW.

During the uranium-aluminum process line and building 301 column dissolvers inspection, the team interviewed and observed the activities of two SEWs to assess the effectiveness of the SEW program. The SEWs were providing oversight of BPF, in addition to the Navy Fuel line, and were effectively meeting the expectations for both processing lines. The VP of Operations indicated that SEWs were meeting his expectations for the SEW's roles, responsibilities, and authorities.

No new observations were made during the uranium-aluminum process line and the building 301 column dissolvers inspection to alter the conclusions from the Navy Fuel line and uranium metal/oxide readiness inspections.

11. Implement an initiative to increase management presence and engagement on the process floor that will better enable open and timely communication of potential safety concerns. This initiative will be structured around a series of daily meetings held by management with processing personnel.

During the Navy Fuel line inspection, the team reviewed the licensee's procedures for implementation of an initiative to increase management presence and engagement on the process floor. This guidance was contained in licensee standing order, NFS-SO-09-006. The team determined that the licensee had put in place appropriate processes, procedures, and personnel to increase management presence and engagement on the process floor to better enable open and timely communication of potential safety concerns.

During the uranium-aluminum process line and building 301 column dissolvers inspection, the team observed daily meetings and shift turnover meetings between management and processing staff at the Navy Fuel line and BPF. The team determined that the meetings continued to be an effective method of increasing management engagement on the process floor.

The team discussed and reviewed the watch bill schedules for managers, engineers and safety representatives on the floor as well as roaming senior managers throughout the plant. The team concluded that the increased management presence enabled open and timely communications of potential safety concerns.

No new observations were made during the uranium-aluminum process line and the building 301 column dissolvers inspection to alter the conclusions from the Navy Fuel line and uranium metal/oxide readiness inspections.

12. Develop updated programmatic guidance to provide specific criteria to invoke Corrective Action Review Board (CARB) review of investigations, corrective actions and effectiveness reviews to help ensure appropriately broad investigations and effective corrective actions.

This item was comprehensively reviewed during the Navy Fuel line readiness inspection. The team concluded that the licensee had put in place appropriate processes, procedures, and personnel to effectively provide criteria to invoke CARB reviews to ensure appropriately broad investigations and effective corrective actions. The CARB is now chaired by the NFS President. No new observations were made during the uranium-aluminum process line inspection to alter the conclusions.

No new observations were made during the uranium-aluminum process line and the building 301 column dissolvers inspection to alter the conclusions from the Navy Fuel line inspection.

13. Revise and implement the procedure that requires processes, process parameters and process inputs be clearly defined prior to implementation. This program is designed to prevent changes such as a change in the composition and physical characteristics of the feed material that may result in abnormal occurrences during processing.

This item was comprehensively reviewed during the Navy Fuel line readiness inspection. That inspection reviewed NFS-CM-004, “Change Control Process,” Rev. 3 which addresses increased management oversight in the change process and NFS-TS-009, “Configuration Management of Process Change,” which required a technology review for a subset of those changes. NFS-TS-009 stated that all changes either due to new processes or changes to existing processes must be documented by an approved technical basis in accordance with NFS-CM-004. The team concluded that the licensee effectively implemented the procedure that requires process parameters and process inputs be clearly defined prior to implementation.

During the uranium-aluminum process line and building 301 column dissolvers inspection, the team discussed the most recent changes and associated technology reviews. The completed technology reviews for uranyl nitrate crystals and uranium-aluminum fuel elements were evaluated. Examples of the revised process implemention were observed during the review of the design basis for this inspection. The team determined that ECRs and technology review

(TR) documents selected for review associated with the uranium-aluminum process line and building 301 column dissolvers were prepared in accordance with the newly enhanced process change procedures and contained the appropriate level of detail and technical basis documentation to allow for thorough licensee reviews.

No new observations were made during the uranium-aluminum process line and the building 301 column dissolvers inspection to alter the conclusions from the Navy Fuel line and uranium metal/oxide inspections.

14. Conduct an independent review of NFS' investigation processes. This review will be conducted by a subject matter expert (SME) to establish a plan to implement enhancements necessary to ensure adequate breadth and depth of investigations.

This item was completed comprehensively during the Navy Fuel line inspections. The team concluded that the licensee had put in place appropriate processes, procedures, and personnel to effectively conduct an independent review of their investigation processes and establish a plan to implement enhancements necessary to ensure adequate breadth and depth of investigations.

No new observations were made during the uranium-aluminum process line and the building 301 column dissolvers inspection to alter the conclusions from the Navy Fuel line and uranium metal/oxide inspections.

15. Revise the procedure that provides guidance for preparation of set-point analysis documentation to enhance the basis of evaluation, specifically to provide guidelines for justifying the basis for critical parameters.

During the Navy Fuel line inspection, the team reviewed ENG-EPS-A-003, "Setpoint Verification and Design Parameter Documentation," Rev. 1, dated January 1, 2010, and its preceding 2006 version. NRC concluded that the licensee has put in place the appropriate procedure to provide guidance for setpoint analysis documentation, including a new worksheet for critical parameter documentation.

During the design basis portion of the uranium-aluminum process line and building 301 column dissolvers readiness inspection, the team verified setpoint calculations associated with IROFS for uranium-aluminum dissolution, bowl cleaning, and the column dissolvers. Selected safety-related equipment (SRE) tests were examined to verify that the IROFS safety function was being appropriately tested. The team examined various setpoint calculations to ensure the design basis as described in the accident consequence evaluations was constructed in an accurate and logical fashion. The team determined that the setpoints were being properly developed in accordance with procedure.

No new observations were made during the uranium-aluminum process line and the building 301 column dissolvers inspection to alter the conclusions from the Navy Fuel line and uranium metal/oxide inspections.

B. MANAGEMENT ISSUES

During review of the above items, the team evaluated whether the licensee's assessment and corrective actions adequately addressed the management issues listed in the CAL. Those issues involved the adequacy of NFS' management oversight of facility process changes,

perceived production pressures, lack of questioning attitude by workers and management and poor communications. NFS completed a broad set of corrective actions to address the four management issues.

1. Management Oversight of Facility Process Changes

Inspection Scope:

The restart readiness assessment teams for the Navy Fuel and the uranium-metal/oxide lines concluded that the process change enhancements provided for adequate management oversight of the change process. NRC determined that these enhancements were effective in addressing the causal factors identified from the licensee's investigation of the BCS event. During the uranium-aluminum process line and building 301 column dissolvers inspection, the team evaluated several modifications to determine if the processes for management of changes had been followed.

Observations:

As discussed in Section C.2 of this report, the team reviewed four Major work requests, two Minor 2 work requests and seventeen Minor 1 work requests to ensure they were developed in accordance with the recent enhancements to the change process incorporated into procedure NFS-CM-004, "NFS Change Control Process," Rev. 6. The team verified that the change process enhancements directed at ensuring adequate technical basis reviews were completed and documented with appropriate management oversight and approvals. Based on this review, the team determined that the ECRs were prepared in accordance with NFS-CM-004 and the technical basis documentation contained appropriate information to allow a thorough review by licensee personnel.

The team assessed the management oversight of process changes at the facility. The team reviewed five recent TR documents. The team noted that the licensee conducted the reviews with knowledgeable staff.

Conclusions:

No findings of significance were identified. The process change enhancements developed to improve management oversight of facility change processes continue to be adequately implemented.

2. Perceived Production Pressures

Inspection Scope:

The restart readiness assessment teams for the Navy Fuel and the uranium-metal/oxide lines concluded that the licensee had instituted sufficient measures to provide a reasonable assurance that production pressures would be reduced during future operations. During the uranium-aluminum process line and building 301 column dissolvers inspection, the team observed management presence on the floor during planning meetings and during actual operations. The team interviewed staff and management to determine the effectiveness of the initiatives designed to reduce production pressure.

Observations:

The team observed field and management meetings and interactions on the process floor during operation of the Navy Fuel and BPF uranium-metal/oxide lines. The team determined that the resource loading and scheduling for the uranium-aluminum process line and building 301 column dissolvers would not negatively impact the oversight of other portions of the plant. The team noted a continued emphasis on safety over production through the licensee's methodical approach to the restart of the previous process lines.

Conclusions:

No findings of significance were identified. The initiatives developed to prevent the perception of placing production over safety were being adequately implemented by the licensee's management team.

3. Questioning Attitude by Workers and Management.

Inspection Scope:

The restart readiness assessment teams for the Navy Fuel and the uranium-metal/oxide lines concluded that in general, the licensee had put in place appropriate processes, procedures, and personnel to effectively address the lack of questioning attitude that was previously prevalent in the organization. During the uranium-aluminum process line and building 301 column dissolvers inspection, the team observed daily management meetings on the process floor, PIRCS screening meetings and the Three Week Look Ahead meetings. The team interviewed staff and management to determine the effectiveness of the initiatives designed to cultivate a questioning attitude in their employees.

Observations:

The team reviewed the PIRCS database to determine if there was an appropriate threshold for identification of issues. The review showed that the staff was frequently using the corrective action program to identify issues. Review of the SEW logs showed an improved questioning attitude by the process workers and line management.

Conclusions:

No findings of significance were identified. The processes and procedures developed to effectively address the lack of questioning attitude that was previously prevalent in the organization were being effectively implemented. The licensee organization exhibited several indications of continued improvement in questioning attitude.

4. Communications

Inspection Scope:

The restart readiness assessment teams for the Navy Fuel and the uranium-metal/oxide line concluded that the licensee had put in place appropriate processes, procedures, and personnel to effectively address the poor communications that were previously present within the

organization. During the uranium-aluminum process line and building 301 column dissolvers inspection, the team observed daily management meetings on the process floor, PIRCS screening meetings and the three-week look-ahead meeting.

Observations:

The team reviewed the recent implementation of the new work management organization and determined that, once fully implemented, it could potentially facilitate communication between operation and maintenance to better ensure maintenance was completed in a timely and accurate manner. The team noted an improved level of communication on the process floor. Various levels of management were present on the process floor for meetings to communicate expectations. In addition, the licensee had begun utilizing effective planning and scheduling tools for major plant initiatives that effectively communicated to the various organizations the priorities and dependencies of the projects. The team also noted that the licensee was actively tracking and completing the recommendations from the waypoint evaluations through the corrective action program (CAP).

Conclusions:

No findings of significance were identified. The licensee was adequately implementing improvements to communications for various portions of the organization.

C. READINESS TO RESTART THE URANIUM-ALUMINUM PROCSS LINE AND THE BUILDING 301 COLUMN DISSOLVERS

To evaluate whether the issues identified by the NRC in late 2009, which led the issuance of the CAL have been sufficiently addressed, the staff further evaluated the uranium-aluminum process line and building 301 column dissolvers in the areas of procedures, maintenance, corrective actions, design basis and management oversight.

1. Procedures

Inspection Scope:

The team performed a detailed review of various procedures applicable to the uranium-aluminum process line and the building 301 column dissolvers. The team verified that administrative IROFS identified in the Integrated Safety Analysis (ISA) Summary were correctly transcribed into written operating procedures and that these were available to operators. The team verified that limits needed to assure safety for selected controlled parameters were adequately described in the procedures. The team evaluated the procedures' content with respect to process operating limits, operator responses for upset conditions, safety systems and functions, precautions, and warnings. The team also evaluated procedures with respect to various operational aspects, including startup, temporary operation, and shutdown as required by license condition.

Observations:

The inspector's review showed that IROFS were clearly identified in the procedures. Walkdowns of procedures on the process floor showed that they could be conducted as written. Procedure revisions adequately addressed issues that had been identified by the operations

staff. There were no outstanding procedure changes which the team assessed as having an impact on start up of the uranium-aluminum process line and the building 301 column dissolvers.

Conclusions:

No findings of significance were identified. The operating procedures for the uranium-aluminum process line and building 301 column dissolvers would support safe operations.

2. Maintenance/Modifications

Inspection Scope:

The team reviewed maintenance activities and plant modifications for the uranium-aluminum process line and building 301 column dissolvers the the licensee determined to be necessary for restart to evaluate the implementation of the maintenance work control program. The team reviewed a selection of open or recently completed work requests to determine if plant modifications and resolution of equipment and instrumentation issues, identified as necessary for restart of the processes, were appropriately tracked and receiving management attention to ensure completion. The team reviewed post-maintenance and post-modification testing documentation to verify adequate testing of safety-related equipment was completed following maintenance work on the affected system or equipment.

The team interviewed maintenance personnel including management, first line supervision, and mechanics to assess the maintenance organization's ability to handle the additional workload from restart of the processes. The team also interviewed BPF operations, maintenance and health physics personnel to assess the radiation protection staff's ability to support additional operations and maintenance activities as a result of restart of these processes.

The team reviewed technology review documents associated with the uranium-aluminum process to verify the technical reviews conducted were rigorous and met the requirements outlined in the licensee's configuration management procedures.

Observations:

The team reviewed the licensee's implementation of a formal work request management review initiative for open work requests applicable to the BPF uranium-aluminum process line and building 301 column dissolvers. The licensee implemented this initiative in response to weaknesses related to the evaluation and identification of open work requests necessary for restart, identified by the NRC during the Navy Fuel Line restart readiness assessment inspection (documented in NRC Inspection Report Number 70-143/2010-005). To address the weakness, the licensee implemented a formal work request management review initiative in which open work requests were reviewed against specific criteria for determining if the work item should be completed before startup of the uranium-aluminum process line and building 301 column dissolvers. The eleven criteria developed for determining if a work order or modification required completion prior to process line restart included the following:

- Safety significant;
- Significant for safe/effective operation;
- A nuclear criticality concern;
- Potentially hazardous to personnel;

- A concern related to the safety basis of operations;
- Required for regulatory compliance;
- An environmental risk;
- Operationally critical;
- A significant negative impact on quality;
- Procedurally required; and
- Work orders in process that required finishing.

The team reviewed the open work order lists for the uranium-aluminum process line and building 301 column dissolvers and did not note any work orders with improper categorization with respect to the eleven criteria. The team noted that the licensee had adequately identified work orders required for restart and was actively pursuing completion of the work orders still open at the time of the inspection. The team interviewed engineers and safety reviewers and noted improved communications. The team noted that safety reviewers had a good understanding of the changes that they were approving and potential consequences.

The team reviewed a sample of 23 open or recently completed work requests associated with the BPF uranium-aluminum process line and building 301 column dissolvers. The team reviewed four Major work requests, two Minor 2 work requests and seventeen Minor 1 work requests. The team verified that the work requests were properly categorized as Major, Minor 2, or Minor 1, in accordance with the licensee's standard operating procedure (SOP) – 392 "Work Request Procedure", Rev. 22. The team also verified that the work requests contained the necessary work group reviews and approvals, and that safety related equipment requiring a functional test following completion of the work was appropriately identified in the work request. The team performed field walkdowns for five work requests and reviewed the post maintenance functional test documentation. The team verified the field work had been completed and that the functional tests were completed satisfactorily. The team performed a walkdown with a BPF operations supervisor of one of the functional tests for the low nitrogen trickle flow switch, N333XXXXFY1A01A. This safety equipment was utilized in the uranium-aluminum dissolution process and was required to be performed every six months. The supervisor demonstrated adequate knowledge of how to perform the procedure and the steps to take should a safety control fail to meet the acceptance criteria of the test, which included entering the test failure into the PIRCS.

The team verified that safety and regulatory reviews of ECRs (documented in "Safety and Regulatory Review Routing Forms") were conducted in accordance with approved procedures. The team determined that the basis for the licensee's conclusions was adequately supported by the documentation. The team noted that the licensee had not yet instituted a formal policy to ensure that a single individual performs both the Safety Director's and the Safety and Safeguards Review Council Chairman's approval of modifications. The team did not note any instance where the safety and regulatory management review questions had been signed off for both positions by the same individual. The licensee was in the process of formalizing the prohibition, which was being tracked as in PIRCS # P23575.

The team reviewed whether the implementation of the ISA Screening Guidelines had been an effective substitute to a peer review of the ISA Team Lead review. Based on the reviewed ECRs, work orders, and interviews, the team determined that the implementation of the ISA Screening Guidelines had been an effective tool to help ISA reviewers understand the scope of changes and determine when a detail review is necessary. The team did not identify any issue where a change was approved and implemented without the appropriate reviews.

To evaluate the maintenance organization's ability to respond to an increased workload from restart of these processes, the team reviewed maintenance backlog information, maintenance staffing levels, and the implementation of the licensee's pilot work control program. The team also interviewed maintenance managers, a maintenance supervisor, and multiple maintenance mechanics during the inspection. The team noted that the licensee's maintenance organization had 26 mechanics available to perform various electrical, mechanical and electronics work throughout the plant. The team verified that the backlog of maintenance work was being tracked by the licensee as part of their maintenance performance metrics. The team reviewed the metrics and found the backlog had been adequately maintained at a level less than two weeks per assigned mechanic for the past two years, which meets the benchmark the licensee was measuring performance against for maintenance backlog.

From interviews with BPF operations, health physics, and maintenance personnel, the team determined that radiation technicians were providing adequate support to operations and maintenance activities in the plant both during the day and night shifts. The team determined that the licensee had adequate radiation protection support for additional operations with over forty health physics personnel on staff. The team reviewed the licensee's recent implementation of a pilot Work Management program for the BPF. The team noted that licensee had begun to assign personnel to fill the roles of work planners, parts specialists, and work coordinators. The team observed that the organization had a daily meeting to discuss safety issues, prioritize work, allot maintenance resources, and resolve issues related to safety work permits required for various work activities. The team noted that the work management initiative was too early in the implementation stage to assess its effectiveness. However, the team noted, that if implemented effectively, it had the potential to improve coordination between work groups and ensure more timely completion of maintenance activities.

The team reviewed five TR documents relateded to proposed process changes as part of the licensee's Reliable Fuel Supply program contract. Four of the process changes and associated TR documents were related to the size reduction process and subsequent dissolution of the material in the uranium-aluminum dissolution system. The fifth TR document related to processing of uranyl nitrate crystals through the BPF. The team determined the TR documents met the requirements for performance of detailed technical basis review of changes to existing processes as contained in NFS-TS-009, "Configuration Management of Process Change," Rev. 2. The team noted that the TRs were rigorous in identification of risks associated with the proposed process input material changes. NFS-TS-009 requires identification of risks in four categories: Safety, Compliance, Quality and Cost. The team verified that the risks identified were assigned appropriate prevention/mitigation requirements in each of the five TR documents. The team noted that the four TR documents associated with size reduction process properly identified safety risk prevention/mitigation requirements for the concern with reactivity of metal shavings and fines during dissolution in the uranium-aluminum process. The TR required that the size reduction and uranium-aluminum dissolution procedures contain procedural controls to uniquely identify metal shavings and fines and to prevent introduction of these materials into the dissolution process. The team verified that the TR documents had adequate supporting documentation, including analytical laboratory test reports, to support their conclusion and did not note any issues with performance of the detailed TRs.

Conclusions:

No findings of significance were identified. The licensee had adequately identified maintenance work activities required for restart of the BPF uranium-aluminum process line and building 301 column dissolvers and was actively pursuing completion of restart work items with an open

status. The licensee had adequate maintenance and radiation protection personnel to support additional operations and that maintenance management adequately controlled the backlog of maintenance work items. The TR documents reviewed were rigorous in identification of safety risks associated with process changes to the BPF uranium-aluminum process and included appropriate prevention or mitigation controls to handle the risks. The licensee implemented the change control program in accordance with the license application requirements.

3. Corrective Action Program

Inspection Scope:

The team evaluated the licensee's CAP to ensure that outstanding items were being adequately prioritized, assessed and addressed. The team evaluated the current backlog of corrective action items against the historical trend to identify potential deficiencies in resource loading and verify the licensee ability to support the restart of an additional process line.

Observations:

The team reviewed 48 open PIRCS entries and 17 Investigations. No significant issues were identified that would impact the safe restart of the uranium-aluminum process line and the building 301 column dissolvers. The team noted that the backlog of corrective action items increased when a new process line was restarted. However, the team noted that the licensee was steadily reducing the number of items as the restarted operations normalized to a more steady-state operation after a few weeks.

The team noted that several employees had a high number of overdue corrective actions. The team evaluated the actions and determined that the overdue corrective actions would not impact the safe operation of the facility. In addition, the team noted that the licensee did not have a formal process to ensure commitments assigned from the CAP would not overload individuals. The team evaluated this potential vulnerability and noted no significant issues.

The team noted that the licensee did not have a formal process to ensure a commitments assigned to an employee no longer employed at the facility would be properly reassigned. The licensee acknowledged the issue and had instituted an informal process to have human resources inform the CAP manager of the employee's departure. The licensee entered the observation in the CAP as PIRCS #24337.

The team assessed the implementation of the CARB. The team determined that the CARB showed an adequate questioning attitude when reviewing corrective actions and investigations. In addition, the team determined that the CARB was focused on ensuring that extent of condition and extent of cause investigations were performed, when warranted. The team noted that the licensee has raised the standard with respect to the quality of corrective actions, and corrective actions that did not meet the standard were not accepted.

Conclusions:

No findings of significance were identified. The licensee had properly prioritized assigned risk, proposed or completed investigations, and proposed or completed corrective actions, specific to the uranium-aluminum process line and the building 301 column dissolvers.

4. Design Basis

Inspection Scope:

The team performed a review of the facility's ISA with a particular focus on the uranium-aluminum dissolution system, bowl cleaning station, size reduction glovebox, and building 301 column dissolvers. As part of this review, the team selected several accident sequences to verify that the worst case consequence had been determined. In addition, the team evaluated if adequate IROFS had been designated as a result the accident sequence evaluation. The team examined various IROFS to verify that adequate and appropriate management measures were implemented to ensure the IROFS could perform their intended safety function when needed. The team also performed walkdowns in the field to verify the presence of the IROFS. Selected SRE tests were examined to verify that the IROFS' safety function was being appropriately tested. Finally, the team examined various setpoint calculations to ensure the design basis as described in the accident consequence evaluation was constructed in an accurate and logical method.

Observations:

The team reviewed Engineering Practices and Standards ENG-EPS-A-003, "Setpoint Verification and Design Parameter Documentation," dated January 23, 2010. This document defined the roles and responsibilities for setpoint analyses performed by the licensee as well as defining how to properly perform a setpoint analysis. The team determined that this was an adequate method of creating setpoint analyses. The team discussed this document with operators, process engineers, safety analysts, and management personnel to determine how the document is used, if they had input in creating the document, and if they have had any problems implementing the document. No significant issues were identified.

The team reviewed multiple setpoint analyses performed by the licensee related to the uranium-aluminum process line and the building 301 column dissolvers to determine if the licensee had adequately implemented ENG-EPS-A-003. The team determined that the Engineering Practices and Standards document was being implemented properly and the setpoint analyses that were reviewed were performed with the appropriate level of rigor based on the complexity of the processes. No significant issues were identified.

The team reviewed the assumptions and initial conditions related to multiple IROFS and associated management measures in the uranium-aluminum process line and the building 301 column dissolvers. The team determined that the licensee made conservative assumptions and initial conditions to preclude the failure of the IROFS and to assure its availability and reliability. Also, the reviewed management measures, including functional tests, were determined to adequately test the functionality of the IROFS to ensure availability and reliability of the IROFS. No significant issues were identified. The team noted that 14 Safety Related Equipment (SRE) functional tests had not yet been performed. However, the licensee was adequately tracking the status of the tests and was committed to performing the functional tests prior to restarting the process. Subsequent to the on-site readiness inspection, the NRC resident team verified that the SRE functional tests were performed according to procedures and that the SRE passed the requirements as stated in the functional tests.

The team reviewed a select number of accident consequence evaluations that were determined to be low consequence by the licensee, specifically related to hydrofluoric acid and NO_x gas production for the uranium-aluminum process line and the building 301 column dissolvers. The

team discussed the chemical evaluations with the safety analysts and management to determine the methodology that was implemented. The team determined that the low consequence events that were reviewed had been adequately reviewed and appropriately determined to be low consequence events and met the expectations of ENG-EPS-A-003.

The team performed multiple plant tours and performed "what if" analyses to determine if the licensee had addressed the potential accident scenarios that were identified by the team. No significant issues were identified.

The team interviewed process engineers, safety analysts, operators, and management personnel to determine their current workload and how it would be affected by restarting the uranium-aluminum process line and the building 301 column dissolvers. Based on these interviews, the team determined that the licensee's organization was adequate to handle the increased work load. Also, the licensee was in the process of looking for an additional process engineer to help reduce the work load for the current process engineers.

The team reviewed the "Process Engineering Work Environment Review," dated May 5, 2010. This document was initiated as a corrective action in response to the Full Team Root Cause Investigation (I10059) created due to the BCS Event. In this document, the licensee recommended transferring many routine tasks from the engineering group to other cognizant groups (such as operations or maintenance), which should reduce the workload on the process engineers. This document also gave multiple examples of tasks that could be improved to save time for the process engineers. The team determined that this was an adequate review of the process engineers work environment and the suggestions made by the engineering group were adequate.

Conclusions:

No findings of significance were identified. The licensee adequately identified and implemented IROFS for the uranium-aluminum process line and the building 301 column dissolvers and has properly staffed the safety and engineering organizations that provide oversight.

5. Management Oversight

Inspection Scope:

The team assessed the effectiveness of the SEW in monitoring activities in the facility. The team reviewed SEW guidance contained in standing order NFS-SO-10-008, "Enhanced Operations, Management, and Communications," to evaluate the guidance provided to the SEW on roles and responsibilities. The team interviewed and observed two members of the SEW during their daily routine and reviewed SEW log entries for a recent one-week period to determine if they were adequately monitoring activities during their shift. The team observed an SEW turnover briefing with the Vice President of Operations to verify that issues encountered during the shift were brought to management's attention. The team reviewed the staffing and workload of the SEW position to verify that with the restart of the uranium-aluminum process line and the building 301 column dissolvers that the SEW would be able to provide the level of technical oversight expected by management.

Observations:

The team reviewed NFS-SO-10-008 and verified by personnel interviews that the guidance provided to the SEW on their roles and responsibilities with respect to operational issues which could impact safety, and procedural compliance issues was well understood by both operations supervision and the SEWs. The team observed and interviewed two members of the SEW during the inspection and observed them during their shift routines. During the interviews, the SEWs demonstrated adequate knowledge of the operational status and the SRE of the processing operations they are tasked to oversee. The SEWs were aware of maintenance work that was planned for their shift and were aware of PIRCS issues that had come up during their shift and the previous shift.

The team reviewed SEW log entries from a one-week period and noted the entries contained pertinent observations and information on safety and operational issues in the facility. The team observed a turnover of the SEW with the VP for Operations noted that issues that arose during the shift, requiring management attention, were properly communicated during the turnover. The team reviewed the staffing level of the SEW and learned that one of the SEWs was recently promoted to another position. In response to the vacancy, the VP of Operations had begun interviewing candidates for the vacant SEW position to maintain the staffing level at five SEWs, which would provide flexibility for the SEWs in using personal leave and ensure an even distribution of weekend duties. The team noted no significant issues with regard to SEW staffing.

Conclusions:

No findings of significance were identified. The SEW position provided adequate oversight and safety focus to the Navy Fuel line and BPF uranium-metal/oxide process operations. The licensee initiated action to ensure SEW staffing would be maintained at a level able to handle the additional workload associated with the start up of the uranium-aluminum process line and the building 301 column dissolvers.

D. EXIT MEETING

During the course of the inspection, the team provided members of the plant staff and management with summaries of inspection observations on a daily basis. During these discussions, licensee representatives identified some material examined during the inspection relating to as proprietary. All proprietary information was returned to the licensee. The team presented the inspection results to members of the plant staff and management at a public meeting conducted on August 3, 2010, in Erwin, TN. The plant staff acknowledged the findings presented.

ATTACHMENT

KEY POINTS OF CONTACT

Licensee

D. Amerine, President, Nuclear Fuel Services
E. Athon, Director Applied Technology/Principle Scientist
R. Dailey, Director, Engineering
M. Elliott. Director, Quality, Safety, and Security Department
T. Lindstrom, Vice President of Operations
M. McKinnon, Director of Operations
J. Nagy, Chief Nuclear Safety Officer
J. Wheeler, Licensing and ISA Manager

LIST OF ITEMS OPEN CLOSED AND DISCUSSED

Discussed

None

LIST OF DOCUMENTS REVIEWED

Procedures

NFS-HS-A-67, "Documenting the Safety and Regulatory Review of Facility Changes," Rev. 6
NFS-GH-911, "Integrated Safety Analysis Program," Rev. 4
NFS-GH-918, "Directed Investigation Program," Rev. 7
NFS-GH-920, "Radioactive Materials Pre-receipt Review Program," Rev. 3
NFS-GH-922, "The NFS Problem Identification, Resolution, and Correction System," Rev.9
NFS-HS-A-67, "Documenting the Safety and Regulatory Review of Facility Changes," Rev. 6
NFS-HS-A-68, "ISA Risk Assessment Procedure," Rev. 4
ENG-EPS-A-003, "Engineering Practices and Standards, Setpoint Verification and Design Parameter Documentation," Rev.1
Procedure IROFS-333-NATRL, "Functional test of NO_x detection system in UAL process"
Procedure IROFS-333-UALBCS, "Functional test procedure of pressure relief valve in UAL process"
Procedure IROFS 333-UGENER, Functional Test of NO_x detection system in UAL Process Area
Procedure IROFS 333-UALUMN, Functional test of glove box air sweep
Procedure IROFS 301-PROCESS, Functional Test of high temperature automatic shutoff for CDL Column Dissolvers
Procedure IROFS 301-GENERAL, Functional Test of overhead line in the CDL area
SOP 392, "Work Request Procedure," Rev. 22
SOP 409, Section 27, "Centrifuge Bowl Cleanout Process," Rev. 19
SOP 409, Section 10, "Uranium Aluminum Dissolution," Rev. 30
SOP 409, Section 31, "Size Reduction Station," Rev. 0
SOP 409, Section 51-301, "Column Dissolver and Filtration Operation," Rev. 3
LOA-2062N-043, "RFS U-Aluminum Fuel Element Processing Test Plan"

Miscellaneous Documents

Memo to D. Nixon from A.G. Harber, "O-Rings for CDL CPVC/PVC Valves," June 18, 2010
CD Line Integrated Safety Analysis Summary, Rev. 2,
Memo: 55T-09-0075, ASCO 8851 Series Solenoid Valves
NFS Site Integrated Safety Analysis Summary, Rev. 7
NFS BLEU Preparation Facility Integrated Safety Analysis Summary, Rev. 7
Set Point Analysis, B-333 BPF Bowl Wash Station Pressure Relief Valve Set Point Analysis
BPF-CHEM-31, Consequence Calculation Sheet BPF Chemical ACE
Bureau Veritas Project No. 08010-00097.00, SUBJECT: Ammonia Nitrate Hazard Evaluation, 4/27/10
NFS Chemical Analysis Methodology and Calculations, Rev. 3
Setpoint Analysis ID# CDCD-24-31, CDL Column Dissolver System NOx Controls Setpoint Analysis
54T-09-0073, Nuclear Criticality Safety Evaluation for the BPF ETR/GETR/MTR/HFIR Fuel Element Size Reduction Enclosure, Rev. 0
302/303 Area 800, SRE N306XFILTERx811/x812, N307XFILTERx811/x812 – P&ID 306-F0015-D, 307-F0302-D, 307-F0307-D Setpoint Analysis
Setpoint Analysis ID# GEN-BPF-43/BUND-17, BPF HEU & LEU Area NO_x Detector Setpoint Analysis
Setpoint Analysis ID# SA-BBC-4-1P01, Bowl Wash Station 2 Columns Set Point Analysis
Setpoint Analysis ID# SA-BUA-15, 16, 17, 18, BPF U-Al Dissolvers Air Flow Set Point Analysis
Setpoint Analysis ID# SA-BPF-35, 36, BPF DI Water Header Pressure Reducers Set Point Analysis
HEU-11-01-01, RFS Fuel Element Chemical and Physical Characteristics: MTR (ETR/GETR) Fuel Elements
Technical Basis Document 20101022, Modify ENG-EPS-A-003
CCN200857576, Contract No. DE-AC52-07NA25729, Supplemental Information of Rover Parka Fuel Elements
333-F0710-D, Enclos-1R01 P&ID
333-F0059-D, BPF Process Ventilation P&ID U-ALUM DISSOLVERS
333-F0060-D, BPF Process Ventilation P&ID
333-F0062-D, BPF Process Ventilation System P&ID
333-F0466-D, BPF Ventilation Knockout Column P&ID
333-F0423-D, BPF U Aluminum Dissolution Centrifuge Cleanout Station P&ID
301-F0230-D, Column Dissolver Disolv-4B01 P&ID (CDL-13)
301-F0231-D, Column Dissolver Filters P&ID (CDL-14)
301-F0240-D, 301 CDL Acid Knockout Column P&ID (CDL-18)
301-F0229-D, 301 Column Disolv-4A01 P&ID (CDL-13)
301-F0254-D, Scrubber Header P&ID
Setpoint Analysis ID# SA-BUA-9, SA-BUA-10
IAC 769, Installation of Ferrous Sulfamate Feed to BPF Solvent Extraction
Process Engineering Work Environment Review, May 5, 2010
Management Readiness Assessment Waypoint Evaluations for April 9, 2010; May 17, 2010; and June 11, 2010
Standing Order NFS-SO-10-002
Standing Order NFS-SO-10-008
Technology Review, TR-10-003, Technology Review of RFS Uranyl Nitrate Crystals
Technology Review, TR-10-004, Technology Review of Phase 1 RFS Element Size Reduction
Technology Review, TR-10-049, Technology Review of Phase II RFS Element Size Reduction
Technology Review, TR-10-052, Technology Review of Phase III RFS Element Size Reduction
Technology Review, TR-10-054, Technology Review of RFS U-Al Reactor Element Dissolution

CEA-10-068, Release of RFS Reactor Elements for Size Reduction in BPF
CEA-10-069, Release of RFS Uranium - Aluminum Reactor Elements for Dissolution in BPF
CEA-10-070, Release of RFS Uranyl Nitrate Crystals for Dissolution
NFS-TS-009, Configuration Management of Process Change
NFS-CM-004, NFS Change Control Process
SRE Tests: N333XDRAINH1J08, N333XDRAINH1J09, N333OVRFLO1E01A, N333OVRFLO1E01B, N333OVRFLO1E04A, N333OVRFLO1E04A, N333XXXXFY1A11A, N333XXXXFY1B01A, N333XXXXFY1B11A, N333XXXXFY1A01A, N333XDRAINH1C10

Problem Identification, Resolution, and Correction System Reports (Identification No.)
P8993, P9821, P11919, P12832, P12991, P13678, P15602, P16867, P16887, P18736, P19462, P19809, P19965, P20037, P20566, P20667, P20984, P21914, P22381, P22752, P23093, P23300, P23322, P23506, P23626, P23652, P23669, P23807, P23910, P24011, P24058, P24088, P24160, P24276, P24324, P24386, P24475, P24572, P24637, P24671, P24720, P24788, P24987, P25052, P25056, P25045, P25078, P25150, P25203, I10635, I10675, I11125, I10780, I11262, I10941, I10950, I9572, I10212, I11166, I11017, I10849, I11258, I10733, I11303, I11113, I10930, I10889, I10461

Work Requests
119139, 134732, 136190, 140190, 140191, 134992, 134732, 140190, 140191, 141647, 141195, 141647, 141878, 141623, 142888, 143480, 143520, 143524, 143525, 143498, 144264, 143497, 143500, 143356, 143485, 143854, 144906, 144756, 144908, 141631, 144294, 144709

Enterprise Change Requests
20100440, 20100669, 20100656, 20100799

LIST OF ACRONYMS

AIT	Augmented Inspection Team
BCS	Bowl Cleaning Station
BLEU	Blended Low Enriched Uranium
BPF	BLEU Preparation Facility
CAL	Confirmatory Action Letter
CAP	Corrective Action Program
CARB	Corrective Action Review Board
CFR	*Code of Federal Regulations*
DFFI	Division of Fuel Facility Inspection
ECR	Enterprise Change Request
IROFS	Items Relied On For Safety
ISA	Integrated Safety Analysis
NO_x	Nitrogen Compound Gas
NRC	Nuclear Regulatory Commission
NFS	Nuclear Fuel Services
PIRCS	Problem Identification, Resolution, and Correction System
RCA	Root Cause Analysis
Rev.	Revision
SEW	Senior Engineering Watch
SME	Subject Matter Expert
SOP	Standard Operating Procedure
SRE	Safety Related Equipment

TR	Technology Review
VP	Vice President