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

December 22, 2010

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

SUBJECT: NRC AMMONIUM DIURANATE PROCESS AND OTHER BUILDING 301 EQUIPMENT RESTART READINESS ASSESSMENT TEAM REPORT NO. 70-143/2010-011

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.

To evaluate the readiness to restart the ammonium diuranate process and other equipment in building 301, a Restart Readiness Assessment Team was established to assure that the "Actions Prior to Restart of Operations," identified in your December 30, 2009 letter, had been satisfactorily completed. The team also evaluated that status of corrective actions you implemented to address the four management issues identified in the Confirmatory Action Letter. These four issues included the adequacy of Nuclear Fuel Services' (NFS') management oversight of facility process changes, perceived production pressures, the apparent lack of a questioning attitude on the part of workers and management, and poor communications on the part of the NFS staff. Additionally, the team performed an evaluation of procedures, maintenance, design bases, the corrective action program, and management oversight initiatives. The team conducted its on-site inspection activities from September 27 through October 1, 2010, and additional in-office follow-up. On October 21, 2010, the NRC completed its inspection of NFS's readiness to restart these processes. The enclosed report documents the inspection results which were discussed with you and other members of your staff in a public exit meeting on November 30, 2010, in Erwin, TN.

The team determined that the 15 "Actions Prior to Restart of Operations" contained in the Confirmatory Action Letter were satisfactorily completed as they pertained to the ammonium diuranate process and other equipment in building 301. During this assessment, the team did not identify any safety or risk significant issues that would preclude a safe startup of the ammonium diuranate process and other equipment in building 301. Therefore, by letter dated

October 22, 2010 (ML102950474), 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. 70-143/2010-011

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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.: 70-143/2010-011

Licensee: Nuclear Fuel Services, Inc.

Location: Erwin, Tennessee 37650

Dates: September 27 – October 1, 2010 (on-site)
October 4 – October 21, 2010 (in-office)

Team: M. Crespo, Senior Fuel Facility Inspector, Division of Fuel Facility Inspection (DFFI) (Team Leader)
M. Romano, Fuel Facility Inspector, DFFI
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Approved by: Steven J. Vias, Chief
Fuel Facility Inspection Branch 1
DFFI

Enclosure

EXECUTIVE SUMMARY

NRC Inspection Report No. 70-143/2010-011

The objective of this Restart Readiness Assessment Team inspection was to verify the completion of actions by Nuclear Fuel Services, Inc. (NFS) in response to the January 7, 2010, Confirmatory Action Letter as it related to the ammonium diuranate process and other equipment in building 301 and to evaluate the NFS organization's readiness to restart these processes. The team also inspected the effectiveness of NFS' corrective actions for management oversight of facility process changes, perceived production pressures, lack of a questioning attitude by workers and management, and poor communications with a focus on the readiness to safely restart these processes. In addition, the team reviewed procedures, maintenance records, design basis of select accident sequences, the corrective action program and backlog, and management oversight initiatives. The Restart Readiness Assessment Team conducted these reviews from September 27 through October 21, 2010.

The team determined that NFS had adequately completed the 15 "Actions Prior to Restart of Operations" contained in the Confirmatory Action Letter as they pertained to the ammonium diuranate process and other equipment in building 301. The team also concluded that NFS' corrective actions related to management oversight, perceived production pressure, lack of questioning attitude, and poor communication continued to be effective and had a sufficient likelihood of being effective to support safe startup and operation of 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 Documents 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, Tennessee. 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, uranium-metal/oxide, and uranium-aluminum lines to restart on March 23, 2010 (ML100820047), May 19, 2010 (ML101390388), and July 6, 2010 (ML101870634), respectively.

By letter dated August 13, 2010 (ML102300559), NFS notified the NRC of its readiness to restart the ammonium diuranate process and other equipment in building 301. The specific portions of the NFS facility included the ammonium diuranate precipitation and calcination system, sorting station, packaging station, and heel removal station. The NRC conducted inspection activities at NFS from September 27 to October 1, 2010, followed by additional in-office reviews and documentation. On October 21, 2010, the NRC completed the inspection of the licensee's readiness to restart the processes. The team did not identify any safety or risk significant issues that would preclude a safe startup of the ammonium diuranate process and other equipment in building 301. Therefore, by letter dated October 22, 2010 (ML102950474), the Region II Regional Administrator authorized restart of these processes.

Inspection Scope

On September 27, 2010, the NRC dispatched a team of inspectors to evaluate NFS' readiness to restart the ammonium diuranate process and other equipment in building 301. The objectives of the inspection were as follows:

- Assure that the "Actions Prior to Restart of Operations" was 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 ammonium diuranate process and other equipment in building 301.

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. This item was not applicable to the ammonium diuranate process and other equipment in building 301.

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 previous three 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 ammonium diuranate process and other equipment in building 301 readiness inspections, 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.

Based upon the inspectors' observations made during the ammonium diuranate process and other equipment in building 301 inspection, NFS continues to satisfactorily meet this commitment, as documented in the previous three 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) 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.

Based upon the inspectors' observations made during the ammonium diuranate process and other equipment in building 301 inspection, NFS continues to satisfactorily meet this commitment, as documented in 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 ammonium diuranate process and other equipment in building 301 inspections, 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 a recent technology review document involving a modification associated with the ammonium diuranate process to ensure it was conducted in accordance with the guidance in procedures NFS-CM-004, "NFS Change Control Process," Revision 4 and NFS-TS-009, "Configuration Management of Process Change," Revision 2. The team determined that the documents were completed in accordance with licensee procedures and documented adequate technical basis to allow for a thorough review of the process changes by licensee personnel.

Based upon the inspectors' observations made during the ammonium diuranate process and other equipment in building 301 inspection, NFS continues to satisfactorily meet this commitment, as documented in 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 set points and periodic tests) for the uranium-oxide system.

The NRC concluded that the extent of condition reviews were detailed and adequately evaluated 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.
Based upon the inspectors' observations made during the ammonium diuranate process and other equipment in building 301 inspection, NFS continues to satisfactorily meet this commitment, as documented in 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. The team made further evaluations of the identified causal factors as they related to the implementation of NFS-TS-009 and rigor of Technical Basis documentation.

Based upon the inspectors' observations made during the ammonium diuranate process and other equipment in building 301 inspection, NFS continues to satisfactorily meet this commitment, as documented in the previous three 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, the uranium-metal/oxide process, and the uranium aluminum process 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.

Based upon the inspectors' observations made during the ammonium diuranate process and other equipment in building 301 inspection, NFS continues to satisfactorily meet this commitment, as documented in the previous three 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.

Based upon the inspectors' observations made during the ammonium diuranate process and other equipment in building 301 inspection, NFS continues to satisfactorily meet this commitment, as documented in the previous three 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 August 13, 2010, Mr. Amerine, President of NFS, issued a letter to Mr. Reyes, NRC Region II Administrator, requesting NRC review of the ammonium diuranate process and other equipment in building 301.

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 six 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 ammonium diuranate process and other equipment in building 301 inspection, the team reviewed and discussed the new standing order for the SEWs, NFS-SO-10-015, "Senior Engineering Watch," effective September 22, 2010, which superseded the SEW Standing Order NFS-SO-10-12. As evidenced by the most recent Waypoint Evaluations, the SEW role was determined to be successful and the licensee was taking steps to make it a longer term program. The new Standing Order expands the technical responsibilities and reporting requirements for the SEW, while continuing to meet the commitment in the CAL. The inspectors also interviewed and observed the activities of two SEWs to assess the effectiveness of the SEW program. The SEWs were providing oversight in both the Navy Fuel area as well as BPF, and were effectively meeting the expectations for both processing lines. The Vice President of Operations indicated that SEWs were meeting his expectations for the SEW's roles, responsibilities, and authorities. The inspectors confirmed that the licensee has properly implemented the Senior Engineering Watch to assess and assist in the identification and communication of potential safety issues.

Based upon the inspectors' observations made during the ammonium diuranate process and other equipment in building 301 inspection, NFS continues to satisfactorily meet this commitment, as documented in the previous three 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 ammonium diuranate process and other equipment in building 301 inspections, the team observed daily meetings and shift turnover meetings between management and processing staff for the Navy Fuel line and BPF. The team determined that the meetings continued to be an effective method of open and timely communication of potential safety concerns.

The team discussed and reviewed the changes to the manager Watchbill schedule, noting the Senior Managers no longer have the "Watchbill", but continue to have a schedule for "Management By Walking Around" to assess and rate conduct of operations attributes. The team also reviewed the logs for the Senior Management team walk arounds and concluded that the increased management presence enabled timely communications and assessment of potential safety concerns.

Based upon the inspectors' observations made during the ammonium diuranate process and other equipment in building 301 inspection, NFS continues to satisfactorily meet this commitment, as documented in the previous three 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 inspectors noted that NFS was implementing a change to the CARB which would assign the NFS President as the CARB Chairman. The inspectors attended a CARB meeting where they observed a collegial discussion of the disposition of safety and/or regulatory issues.

Based upon the inspectors' observations made during the ammonium diuranate process and other equipment in building 301 inspection, NFS continues to satisfactorily meet this commitment, as documented in the previous three readiness inspections.

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," Revision 3 which addressed 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 required process parameters and process inputs be clearly defined prior to implementation.

During the ammonium diuranate process and other equipment in building 301 inspections, the team discussed a recent change and associated technology review. The completed technology reviews for dissolution of uranium tetra fluoride and the material of construction of o-rings were evaluated as part of the review of the design basis for this inspection. The team determined that ECRs and the 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 documented technical basis to allow for thorough licensee reviews.

Based upon the inspectors' observations made during the ammonium diuranate process and other equipment in building 301 inspection, NFS continues to satisfactorily meet this commitment, as documented in the previous three readiness 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.

During the ammonium diuranate process and other equipment in building 301 inspections, the inspectors reviewed a sample of investigations and concluded that the licensee continued to adequately conduct quality investigations as necessary. Based upon the inspectors' observations made during the ammonium diuranate process and other equipment in building 301 inspection, NFS continues to satisfactorily meet this commitment, as documented in the previous three readiness 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," Revision 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 ammonium diuranate process and other equipment in building 301 readiness inspections, the team verified setpoint calculations associated with IROFS for ammonium diuranate precipitation and calcination, sorting station, packaging station, and heel removal station inspection. 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 set points were being properly developed in accordance with procedure.

Based upon the inspectors' observations made during the ammonium diuranate process and other equipment in building 301 inspection, NFS continues to satisfactorily meet this commitment, as documented in the previous three readiness 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 three previous readiness inspections 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 ammonium diuranate process and other equipment in building 301 inspections, 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 two Major work requests, two Minor-2 work requests and one Minor-1 work request to ensure they were developed in accordance with the recent enhancements to the change process. 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 Engineering Change Requests were prepared in accordance with approved procedures 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 the recent technology review documents associated with uranium tetra fluoride dissolution and the material of construction of replacement o-rings. 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 line, the uranium-metal/oxide line, and the uranium-aluminum process line and building 301 column dissolvers concluded that the licensee had instituted sufficient measures to provide a reasonable assurance that production pressures would be reduced during operations. During the ammonium diuranate process and other equipment in building 301 inspections, the team observed management presence during Daily Stand Up meetings on the floor and during operations throughout BPF. The team also observed and interviewed staff at a Work Control turnover meeting, including Work Control schedulers and planners as well as operations supervisors and SEWs. The inspectors reviewed the Conduct of Operations and associated procedures to verify the prioritization of safety over production. The inspectors conducted interviews with a selection of licensee staff to evaluate 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 throughout BPF. The team observed the shift turnover meetings and determined that the appropriate management, Senior Engineering Watch, and staff participated in the meetings. The inspectors also noted that the shift turnover meetings were held in accordance with the NFS-OPS-001, "Conduct of Operations Procedure," Revision 1.

The team attended a Work Control turnover meeting and interviewed select staff after the meeting. The inspectors noted that the Work Control group has made some progress in streamlining work requests. However, the Work Control group had not yet clearly defined roles and responsibilities. The inspectors discussed the priorities and emergent issues with the Work Control staff and reviewed the licensee's weekly newsletter for the week of September 27, 2010, which communicated the purpose of the group and its path forward to all NFS employees. The team discussed the lack of a formal job description and the lack of defined roles and responsibilities with the licensee management. The team noted these observations could result in potential inefficiencies, however, the team concluded that sufficient resources were available to the Work Control department to adequately manage new work control initiatives.

The team also independently evaluated the licensee's response to an event on September 27, 2010 in the uranium-aluminum area in BPF, where a centrifuge bowl was observed by operations staff to have an unusual build up of material. The inspectors attended the Problem Identification, Resolution, and Correction System (PIRCS) screening meeting where the event and immediate actions were discussed. The inspectors noted the licensee staff and management demonstrated conservative decision making by stopping work and questioning the observation; alerting and discussing the event with the SEW and management on the floor; elevating the concern to the appropriate levels of operations and engineering management; and reviewing NFS-EP-001, "Unusual Incident Evaluation Procedure," Revision 2 to ensure appropriate steps were followed for the event.

The team also noted that as the details of the event and subsequent investigation arose, the licensee's management team meetings included the evaluation of potential slippage of contract commitments and deadlines. The Program Management Department, along with the senior managers, assessed and openly discussed the impacts of the uranium-aluminum shutdown due

to the event. As the scenarios were evaluated, the inspectors noted that safety over production was effectively communicated to the management staff. The team observed a continued emphasis on safety over production through the licensee's methodical approach to the September 27th uranium-aluminum area event and to the restart of the previous process lines.

Conclusions:

No findings of significance were identified. The inspectors concluded that 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 previous three readiness inspections 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 ammonium diuranate process and other equipment in building 301 inspections, 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. Additional, as discussed in section B.2 above, the team evaluated the licensee's response to the unanalyzed condition that was discovered regarding the uranium-aluminum process. The team noted that operators, supervisors and managers demonstrated adequate questioning attitude in response to the discovery of the issue and halted operations.

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 line, the uranium-metal/oxide line, and the uranium-aluminum process line and building 301 column dissolvers 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 ammonium diuranate process and other equipment in building 301 inspections, the team

observed daily management meetings on the process floor, PIRCS screening meetings, Plan of the Day meetings and Work Control turnover meetings. The inspectors also reviewed and discussed recent licensee initiatives that have the potential for increasing effective communications, including the use of Human Performance tools, the resource loaded schedule, and a plant-wide streamlining effort.

Observations:

The inspectors observed a variety of staff and management meetings on and off the plant floor. The team noted improvement in the communications of plant safety issues with the new structure of meetings in place, particularly in the Plan of the Day meeting, where all areas of management were represented to facilitate effective coordination and communication of both schedule and safety issues. The team reviewed and discussed the recent implementation of the work management organization and determined that communication challenges exist between the Work Control team and the operations supervisors with respect to each one's role and responsibilities, which were resulting in inefficiencies. The licensee was aware of the challenges and was actively attempting to streamline the communication process between the organizations to address the inefficiencies that were resulting in minor delays in maintenance work.

The team noted an improved level of communication on the process floor, as exemplified in the recent uranium-aluminum centrifuge event where the operator, SEW, and manager effectively evaluated and communicated the unusual incident to the appropriate level of management. The operator stopped work and discussed the event with the SEW. The SEW subsequently asked the appropriate questions about the observation and alerted area management. This event demonstrated the efficacy of the SEW role in facilitating open and effective communication on the floor as well as in the upper chain of management. In addition, various levels of management were present on the process floor for Daily Stand up meetings to communicate their expectations Senior managers walked around and assessed the conduct of operations by staff in both the BPF and Navy Fuels areas.
The inspectors noted three recent initiatives by the licensee that have the potential to further increase effective plant-wide communications. The initiatives are the rollout of Human Performance tools and classes, the Streamlining effort, and the recent addition of resource loading into the schedule. The Human Performance initiative began at NFS two years ago, but had been slow to implement among each organization. However, in the most recent inspection, the inspectors observed Human Performance tools in effect throughout the majority of the facility, including Stop, Think, Act, Review reminders and Three Way Communications classes. In addition, the inspectors independently reviewed the new Streamlining effort underway which provides an overarching structure and defined process to coordinate work and its progress throughout the facility and across all departments. The team learned this Streamlining effort is underway, but will not be fully implemented until the end of the calendar year. Moreover, as a commitment from the April 2010 Waypoint Evaluation, the licensee began utilizing effective planning and scheduling tools for all employees and across all departments to better manage workload and scheduling. This "Fully Integrated Resource Loaded Schedule" is currently in effect and has the capability for each organization to view the priorities, workload, and dependencies of the projects. The inspectors noted that each of these efforts is either new or in progress, but each has the potential to have a positive impact on open and effective communications plant-wide.

Conclusions:

No findings of significance were identified. The inspectors concluded the licensee was adequately implementing improvements to communications across the organization.

C. READINESS TO RESTART THE AMMONIUM DIURANATE PROCESS AND OTHER EQUIPMENT IN BUILDING 301

To evaluate whether the issues identified by the NRC in late 2009, which led to the issuance of the CAL, have been sufficiently addressed, the staff further evaluated the ammonium diuranate process and other equipment in building 301 in the areas of procedures, maintenance, corrective actions, design basis, and management oversight.

1. Procedures

Inspection Scope:

The team performed a detailed review of seven procedures applicable to the ammonium diuranate precipitation and calcination station, sorting station, packaging station, heel removal station, and the wastewater system. The team selected a sample of 15 administrative items relied on for safety (IROFS) from the licensee's Commercial Development Line Integrated Safety Analysis (ISA) Summary, Revision 2, and verified that those administrative IROFS identified in the ISA Summary were correctly transcribed into the applicable written operating procedures. The team selected a sample of administrative IROFS in the seven procedures for the area and, with licensee staff assistance, walked down the area to verify if those IROFS were in place in the station. The inspectors also verified that those applicable procedures were available and in the training and qualification records for the area operators. 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, normal operations, and shutdown as required by license condition.

Observations:

The inspector's review showed that IROFS were clearly identified in the procedures. Walkdowns of procedures for the ammonium diuranate precipitation process and for the packaging system on the process floor verified that appropriate IROFS were in place and the procedures could be performed as written. Procedure revisions adequately addressed issues that had been identified by the operations' staff. The team noted no issues with the outstanding procedure changes which the licensee had yet to implement for the inspected process areas. The team verified that limits needed to assure safety for selected controlled parameters were adequately described in the procedures.

Conclusions:

No findings of significance were identified. The operating procedures for the ammonium diuranate process and other equipment in building 301 adequately support safe operations.

2. Maintenance/Modifications

Inspection Scope:

The team reviewed maintenance activities and other modifications completed on the ammonium diuranate precipitation and calcination station, sorting station, packaging station, and heel removal station. The team reviewed a selection of open or recently completed work requests to evaluate the status of tracking, documentation, and management of maintenance activities in support of process startups. The team reviewed post-maintenance and post-modification testing documentation to verify that testing of safety-related equipment had been adequately completed following maintenance work on the affected system or equipment.

The team interviewed maintenance personnel including management, first line supervision, and maintenance mechanics to assess the maintenance organization's ability to accommodate the additional workload that would result from the startup of the processes. The team also interviewed production operators and radiological technicians to assess the staff's ability to support additional resource demands as a result of the startup.

The team examined technology review documents associated with the ammonium diuranate process and other equipment in building 301 to verify that the technical reviews 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 ammonium diuranate process and other equipment in building 301. The licensee implemented the initiative in response to weaknesses identified by the NRC during the Navy Fuel Line restart readiness assessment inspection, documented in NRC Inspection Report Number 70-143/2010-005. The weaknesses involved inadequate evaluations of work requests and the inability to adequately identify and track open work requests necessary for startup. To address the weaknesses, 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 was required for startup of the ammonium diuranate process and other equipment in building 301. The 11 criteria developed for determining if a work request or modification required completion prior to process line startups are as follows:

- 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 requests in process that required finishing.

The team reviewed open work request lists for the ammonium diuranate process and other equipment in building 301 and did not identify any work requests with improper categorization with respect to the 11 criteria. The team noted that the licensee had adequately identified work requests required for the startup and had completed the required work prior to the inspection. The team interviewed engineers and safety reviewers and noted improved communications. The team observed that safety reviewers had demonstrated good understanding of the changes they were approving.

The team reviewed five open or recently completed work requests associated with the ammonium diuranate process and other equipment in building 301. The team reviewed two Major work requests, two Minor-2 work requests and one Minor-1 work request. 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 governing work requests. 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 work requests and reviewed applicable post maintenance functional test documentation. The team verified applicable field work had been completed and that the functional tests were completed satisfactorily. The team performed a walkdown of the ammonium diuranate process and other equipment in building 301 and determined that the specified safety equipment was in place, identification and calibrations tags were in place, and calibration expiration dates were valid. The supervisor demonstrated adequate knowledge of how to perform activities in accordance with functional testing procedures and what actions to take should a safety control fail to meet the acceptance criteria of the test, which included entering the test failure into the corrective action program.

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 bases for the licensee's conclusions were adequately supported by the documentation. The team noted that the licensee was in the process of instituting a formal policy to ensure that a single individual could not perform both the Safety Director's and the Safety and Safeguards Review Council Chairman's approval of modifications. The team did not identify 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 restriction, which was being tracked under corrective action program # P23575.

Based on the reviewed ECRs, work requests, 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 detailed review was necessary. The team did not identify any issue where a change was approved and implemented without the appropriate reviews.

The team reviewed maintenance backlog information, maintenance staffing levels, and the implementation of the licensee's new work control program. The review was conducted to determine if the maintenance organization could successfully support an increased workload following the startup of the ammonium diuranate processes. The team interviewed maintenance managers, maintenance supervisors, and multiple maintenance mechanics during the inspection. The team noted that the licensee's maintenance organization had 28 mechanics available to perform various electrical and mechanical projects and additional technicians to support 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 that the backlog had been adequately maintained at a stable level of approximately 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 building 301 operations personnel, radiological technicians, and maintenance mechanics, the team determined that radiological technicians were providing adequate support to operations and maintenance activities during all shifts. The team determined that the licensee had adequate radiation protection support for additional operations with over 40 radiation technicians on staff. The team reviewed the licensee's progress initiating the Work Control program for all maintenance related activities. The team noted that the licensee had completed most assignments for all positions including work planners, parts specialists, and work coordinators. The team observed that the organization held a meeting at the beginning of each shift 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 staff was effective although there had been some initial challenges (discussed above in section B.4); and that management was working through these problems and making progress.

The team reviewed a technology review document related to the selection of replacement o-rings used in some process valves. The technology review was performed to evaluate and select the most appropriate construction materials that were most compatible with the various process chemicals and solutions. The team determined the technology review document met the requirements for a detailed technical basis review of changes to existing processes as defined in NFS-TS-009, "Configuration Management of Process Change," Revision 2. The team noted that the technology reviews were rigorous in identification of risks associated with the proposed material changes. NFS-TS-009 required identification of risks in four categories: Safety, Compliance, Quality, and Cost. The team verified that the risks identified were assigned appropriate prevention and mitigation requirements in the technology review document. The team verified that the technology review package contained adequate supporting documentation, including the vendor's material compatibility charts needed to support their conclusion. The team did not identify any issues with the detailed technology review.

Conclusions:

No findings of significance were identified. The licensee adequately managed the maintenance and modification programs to support safe startup of the ammonium diuranate process and other equipment in building 301.

3. Corrective Action Program

Inspection Scope:

The team evaluated the licensee's corrective action program to ensure that outstanding items were being adequately prioritized, assessed and addressed. The team also evaluated the current backlog of corrective action items against the historical trend to identify potential deficiencies in resource loading and verify the licensee's ability to support the restart of an additional process line. The inspectors observed PIRCS screening and CARB meetings and reviewed a suite of newly revised corrective action program department procedures. The team also discussed the staffing and resource allocation for the corrective action program department as well as licensee management and staff responsible for corrective actions.

Observations:

The team assessed the implementation of the CARB. The team determined that the CARB showed an adequate questioning attitude and collegial discussion of issues 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.

The team reviewed 17 corrective actions and four investigations related to the ammonium diuranate process and other equipment in building 301 and verified that there were no safety significant outstanding corrective actions for those areas. The team noted a few corrective

actions overdue for the area, but none had a safety impact for the plant or on restart. The team assessed that no significant issues were identified that would impact the safe restart of the ammonium diuranate process and other equipment in building 301.

However, in discussing overdue corrective actions with the corrective action program manager, the team noted a growing number of overdue corrective actions since the restart of the uranium-aluminum line in July 2010. The licensee had also noted this increase in the backlog over the past few months and had taken the initial steps to begin formulating a plan to address the issue. To assess the significance of the overdue corrective actions, the team independently evaluated approximately 40 “high priority” and “very high priority” overdue corrective actions to assess if there were any latent safety issues that were not actively being addressed and corrected. The team found, with the exception of one item, the overdue items did not present a potentially safety significant action. The team did identify an overdue extent of condition evaluation for a potential chemical safety issue. The issue that generated the extent of condition was identified in August of 2009, yet the licensee had not yet completed the evaluation. After discussing observation with the licensee’s management, the licensee immediately began the extent of condition evaluation. The team reviewed the licensee evaluation and found no issue with the licensee’s determination that the extent of condition was limited to one glovebox that had already been corrected in 2009.

In light of the team’s initial review of the overdue “high” and “very high” priority corrective actions, the team requested additional information from the licensee to determine if other corrective actions may have been left unaddressed that had potential latent safety significance. The team requested and received a data set that included a smart sample of Corrective Action items in PIRCS, including, but not limited to: 1) reports for the very high and high overdue corrective actions reviewed, 2) all overdue moderate items, 3) all items not closed with the words “SRE” or “IROFS,” 3) all items not closed that have a due date in the next six months, 4) the 50 oldest PIRCS not closed, 5) investigations that were associated with high or very high problems, 6) overdue investigations (not including general investigations), and 7) work requests closed in the past 30 days not associated with an entry in PIRCS. The team reviewed approximately 600 actions, which represented nearly half of the assigned corrective actions for the plant. The team’s evaluation of the data concluded that there was no existing outstanding safety related issue that had been left unaddressed.

The team also noted that changes to the corrective action program were in progress. The existing corrective action program procedures were being revised with an implementation date of November 1, 2010. Many of the changes included an effort to streamline the system and to restructure the categorization of priorities. In addition, staffing in the department had recently changed. The corrective action program group now had two analysts, and departmental performance improvement coordinators had been selected to facilitate the resource management of corrective actions for various areas of the plant. These coordinators were recently identified and assigned as the point of contact for the responsibility and accountability of corrective action items in their department. The inspectors discussed the roles and responsibilities of the coordinators with the corrective action program manager and several senior managers. No significant issues were noted with the level of staff of the corrective action program, however, the program improvements would require some “run time” before a formal conclusion could be develop. NRC will evaluate these modifications to the program in future inspections.

Conclusions:

No findings of significance were identified. The corrective action program and the corrective action item backlog were adequately managed to ensure that safety issues were addressed in a timely manner. In addition, no issues were identified that would impact the start up of the ammonium diuranate process and other equipment in building 301.

4. Design Basis

Inspection Scope:

The team performed a review of the facility's ISA with a particular focus on the ammonium diuranate process and other equipment in building 301. 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 IROFSs had been designated as a result of the accident sequence evaluation. The team examined various IROFSs to verify that adequate and appropriate management measures were implemented to ensure the IROFSs could perform their intended safety function when needed. The team also performed walkdowns in the field to verify the presence of the IROFSs. 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 multiple setpoint analyses performed by the licensee related to the ammonium diuranate process and other equipment in building 301 to determine if the licensee had adequately implemented ENG-EPS-A-003, "Engineering Practice and Standards, Setpoint Verification and Design Parameter Documentation," Revision 2. 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. The IROFSs evaluated consisted of overflows, glovebox drains, wet-off gas lines, temperature switches, pressure switches, and backflow preventers. No significant issues were identified.

The team reviewed the assumptions and initial conditions related to multiple IROFSs and associated management measures in the ammonium diuranate process and other equipment in building 301. The team determined that the licensee made conservative assumptions and initial conditions to assure their 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. No significant issues were identified.

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 ammonium diuranate process and other equipment in building 301. 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 hiring an additional process engineer to help reduce the work load for the current process engineers.

Conclusions:

No findings of significance were identified. The licensee adequately identified and implemented IROFSs for the ammonium diuranate process and other equipment in building 301.

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 the new standing order NFS-SO-10-015, "Senior Engineering Watch" to evaluate the guidance provided to the SEW on roles and responsibilities. The team interviewed and observed 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 discussed the SEW turnover briefings with the Vice President of Operations and Director of Engineering to verify that appropriate 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 ammonium diuranate process and other equipment in building 301, the SEW would be able to provide the level of technical oversight expected by management. The team also observed management presence on the floor during Daily Stand Up meetings, operations throughout BPF, and during Senior Management walk arounds.

Observations:

The team reviewed NFS-SO-10-015 and verified by personnel interviews that the guidance provided to the SEW with respect to their roles and responsibilities and procedural compliance issues was well understood by both operations supervision and the SEWs. The team observed and interviewed 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 the maintenance work that was planned for their shift and were aware of PIRCS issues that arose 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 also reviewed the log entries and interviewed SEW staff regarding the recent event on September 27, 2010, in the uranium-aluminum area in BPF, where a centrifuge bowl was observed by operations staff to have an unusual build up of material. The inspectors noted the SEW was on the floor at the time and assisted operations personnel in the escalation of the information to the appropriate senior management level. The team evaluated the process and concluded that the event notifications were made in accordance with NFS-OPS-001, "Conduct of Operations," Revision 1.

The team also discussed the recent changes to the SEW Standing Order. The team noted that it expanded the technical responsibilities of the SEW and, six months after all operations have been restarted, the SEW will report to the Director of Engineering. The SEW continued to meet

the requirements of the CAL. The team also reviewed and discussed the new Standing Order with both the Vice President of Operations and the Director of Engineering and noted that when issues arose during the shift that required management attention, they were properly communicated during the turnover to senior management. The team also reviewed the staffing level of the SEW and concluded it was appropriate and would provide flexibility for the SEWs in using personal leave and to ensure an even distribution of weekend duties. The team noted no significant issues with regard to SEW staffing.

The team discussed and reviewed the changes to the manager Watchbill schedule, noting the Senior Managers no longer have the "Watchbill," but continue to have a schedule for "Management By Walking Around" to assess and rate conduct of operations attributes. The team also reviewed the logs for the Senior Management team walk arounds and concluded that the increased management presence enabled timely communications and assessment of potential safety concerns.

Conclusions:

No findings of significance were identified. The SEW position provided adequate independent oversight and safety focus to the Navy Fuel line, BPF uranium-metal/oxide process line, and the uranium-aluminum process line. The licensee continued to ensure SEW and management presence on the floor would be maintained at a level adequate to handle the additional workload associated with the start up of the ammonium diuranate process and other equipment in building 301.

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. The team presented the inspection results to members of the plant staff and management at a public meeting conducted on November 30, 2010, in Erwin, Tennessee. 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

PARTIAL LIST OF DOCUMENTS REVIEWED

Procedures
SOP 409, Section 19W-301, Wastewater System Cleanout, Revision 2
SOP 409, Section 50-301, Sorting Station, Revisions 0 and 1
SOP 409, Section 57-301, Heel Removal Station, Revision 4
SOP 409, Section 59-301, ADU Precipitation and Filtration, Revs. 7, 8, and 9
SOP 409, Section 60-301, Calciner and Product Unloading Station, Revision 4
SOP 409, Section 61-301, Wastewater System, Revs. 6 and 7
SOP 409, Section 69-301, Packaging Station, Revision 2
NFS-EP-001, "Standard Operational Guidelines for Evaluation of Unusual Incidents," Revision 2
NFS-HS-A-67, "Documenting the Safety and Regulatory Review of Facility Changes," Revision 6
NFS-GH-918, "Directed Investigation Program," Revision 7
NFS-GH-922, "NFS Problem Identification, Resolution, and Correction System," Revision 9
NFS-OPS-001, "Conduct of Operations," Revision 1
NFS-SO-10-008, "Enhanced Operations, Management and Communications"
NFS-SO-10-015, "Senior Engineering Watch"
ENG-EPS-A-003, "Engineering Practice and Standards, Setpoint Verification and Design Parameter Documentation," Revision 2
NFS-TS-009, "Configuration Management of Process Change"

Miscellaneous Documents
NFS Commercial Development Line Integrated Safety Analysis Summary, Revision 2
NFS-SO-10-009, Revised Restart Plan
"Technology Review of UF_4 Dissolution," August 25, 2010

Enterprise Change Requests
20092230, 20091833, 20100206, 20100230, 20101168-01

Process and Instrumentation Drawings Reviewed

301-F0222-D, Revision M, 301 ADU Dissolution
301-F0226-D, Revision M, 301 Product Oxide Unload Station
301-F0228-D, Revision L, 301 Product Sorting & Packaging
301-F0206-D, Revision N, 301 UF6 Cylinder Heel Removal
301-F0218-D, Revision K, ADU Filtrate Column 2C05 & Column 2D05
301-F0217-D, Revision M, ADU Filtrate Column 2A05 & Column 2B05
301-F0219-D, Revision N, 301 H_2O_2 Removal
301-F0210-D, Revision N, 301 ADU Precipitation Make-up & Metering Columns
301-F0220-D, Revision O, 301 Buchner Filtrate Polishing Filters
301-F0215-D, Revision N, ADU Buchner Filter 2A01 & 2B01
301-F0238-D, Revision P, 301 Waste Discard Tanks
301-F0237-D, Revision P, 301 Wastewater Ion Exchange Columns

IROFS and Setpoint Calculations

CDADU-7, 8, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 50, 52, 53, 54, 56
CDG-15, 16, 18, 19
CDPV-08

LIST OF ACRONYMS

AIT	Augmented Inspection Team
BCS	Bowl Cleaning Station
BLEU	Blended Low Enriched Uranium
BPF	BLEU Preparation Facility
CAL	Confirmatory Action Letter
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
SEW	Senior Engineering Watch
SME	Subject Matter Expert
SOP	Standard Operating Procedure
SRE	Safety Related Equipment