



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

August 5, 2014

Mr. Kelly D. Trice  
President and Chief Operating Officer  
Shaw AREVA MOX Services  
Savannah River Site  
P.O. Box 7097  
Aiken, SC 29804-7097

**SUBJECT: MIXED OXIDE FUEL FABRICATION FACILITY- NRC INSPECTION REPORT  
NUMBER 70-3098/2014-002**

Dear Mr. Trice:

During the period from April 1 through June 30, 2014, the U. S. Nuclear Regulatory Commission (NRC) completed inspections pertaining to the construction of the Mixed Oxide Fuel Fabrication Facility. The purpose of the inspections was to determine whether activities authorized by the construction authorization were conducted safely and in accordance with NRC requirements. The enclosed inspection report documents the inspection results. At the conclusion of the inspections, the findings were discussed with those members of your staff identified in the enclosed report.

The inspections examined activities conducted under your construction authorization as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your authorization. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

Based on the results of these inspections, no violations or deviations were identified.

In accordance with 10 CFR 2.390 of NRC's "Rules of Practice," a copy of this letter and its enclosures may be accessed through the NRC's public electronic reading room, Agency-Wide Document Access and Management System (ADAMS) on the Internet at <http://www.nrc.gov/reading-rm/adams.html>.

Should you have any questions concerning this letter, please contact us.

Sincerely,

**/RA/**

Deborah A. Seymour, Chief  
Construction Projects Branch 1  
Division of Construction Projects

Docket No. 70-3098

Construction Authorization No.: CAMOX-001

Enclosure: NRC Inspection Report 70-3098/2014-002  
w/attachment: Supplemental Information

cc w/encl: (See next page)

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Sincerely,

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DATE	07/16/2014	07/21/2014					
E-MAIL COPY?	YES	YES	YES				

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Letter to Kelly Trice from Deborah Seymour dated August 5, 2014.

SUBJECT: MIXED OXIDE FUEL FABRICATION FACILITY- NRC INSPECTION REPORT  
NUMBER 70-3098/2014-002

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**U.S. NUCLEAR REGULATORY COMMISSION**

**REGION II**

Docket No.: 70-3098

Construction  
Authorization No.: CAMOX-001

Report No.: 70-3098/2014-002

Applicant: Shaw AREVA MOX Services

Location: Savannah River Site  
Aiken, South Carolina

Inspection Dates: April 1 – June 30, 2014

Inspectors: M. Shannon, Senior Resident Inspector, Construction Projects Branch 1  
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Accompanying  
Personnel: W. Jones, Director, DCP  
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K. Morrissey, Project Manager, CDMB, FCSS, NMSS

Approved by: D. Seymour, Branch Chief, CPB1, DCP, RII

Enclosure

## **EXECUTIVE SUMMARY**

Shaw AREVA MOX Services (MOX Services)  
Mixed Oxide (MOX) Fuel Fabrication Facility (MFFF)  
NRC Inspection Report Number 70-3098/2014-002

The scope of the inspections encompassed a review of various MFFF activities related to Quality Level (QL) -1 construction for conformance to U.S. Nuclear Regulatory Commission (NRC) regulations, the Construction Authorization Request (CAR), the MOX Project Quality Assurance Plan (MPQAP), applicable design basis sections of the license application (LA) and applicable industry standards. These inspections included, as applicable, the following inspection attributes: corrective action program, installation, material storage controls, procedure controls, and special processes (welding activities).

The principle systems, structures and components (PSSCs) discussed in this inspection report PSSC-021, Fire Barriers, PSSC-023, Fluid Transport Systems, and PSSC-024, Gloveboxes.

### **Routine Resident Inspections**

The inspectors routinely attended the applicant's construction plan-of-the-day meetings, reviewed the status of work packages (WPs) maintained at various work sites, conducted routine tours of work and material storage areas, observed installation of mechanical equipment, and reviewed various corrective action documents to assess the adequacy of the MOX Services' corrective action program. Construction activities were performed in a safe and quality-related manner. No findings of significance were identified (Section 2).

### **PSSC Inspections**

#### **PSSC-021, Fire Barriers**

The inspectors reviewed records and inspected components related to PSSC-021, Fire Barriers, as described in Table 5.6-1 of the MFFF CAR. The inspection attributes observed were procurement, fabrication, and installation and the associated items relied on for safety (IROFS) were fire dampers. No findings of significance were identified (Section 3.a).

#### **PSSC-023, Fluid Transport Systems**

The inspectors observed construction activities related to PSSC-023, Fluid Transport Systems, as described in Table 5.6-1 of the MFFF CAR. The inspection attributes observed were procurement, fabrication, special processes (welding), procedure controls, and installation. The associated IROFS components were process piping, demisters, pulse columns, and scrubbing columns. The inspectors observed welding of piping sections in the aqueous polishing (BAP) active gallery. The inspectors concluded that piping installation (welding) and piping QC inspection activities were acceptable. The inspectors also concluded that revisions to flushing and hydrostatic testing procedures were acceptable. No findings of significance were identified (Section 3.b).

#### **PSSC-024, Gloveboxes**

The inspectors observed construction activities related to PSSC-024, Gloveboxes, as described in Table 5.6-1 of the MFFF CAR. The inspection attributes observed were procedure controls,

special processes (welding), and installation. The inspectors observed ongoing installation and procedure control activities associated with the Green Pellet Storage Unit (PSE) Glovebox (GB) 1000/2000 Shielding Door in accordance with WP 13-CP24-B117-PSE-GB1000/2000-M-001. Observations included alignment of the shielding and extensive welding of the glovebox units.

The inspectors also observed continuing installation activities associated with the following IROFS components: PSE GB1000/2000, Scrap Pellet Storage Unit (PSI) GB1000/2000, Rod Cladding Fabrication (GME) glovebox, Ground Assorted Pellet Storage Unit (PSJ) glovebox, Sintered Pellet Storage (PSF) GB1000/2000, Inner Cap Opening Unit (KDA) GB2000, Ball Milling Unit (KDM) GB4000, and Pellet Transfer Units (PML) glovebox. No findings of significance were identified (Section 3.c).

### **Programmatic Inspections**

#### **10 CFR 70.72 Facility Change and Change Control Process**

The change process, as outlined in Chapter 16 of the LA, was performed by the applicant in accordance with project procedures. Training provided to MOX Services' staff involved with the facility change process was adequate. The inspectors had reasonable assurance that the evaluations properly screened changes to assure that the applicant's commitments related to the regulatory requirements of 10 CFR Part 70 were met. Unresolved item (URI) 70-3098/2014-02-01, Review of equivalency evaluations for changes to NFPA 70-1999 commitments, was identified (Section 4).



## **REPORT DETAILS**

### **1. Summary of Facility Status**

During the period, the applicant (Shaw AREVA MOX Services (MOX Services)) continued construction activities of principle systems, structures and components (PSSCs). Construction activities also continued related to closure of temporary construction openings, concrete excavation activities in the MOX Processing Building (BMP), and finishing activities related to wall, ceiling and floor surfaces of the Mixed Oxide (MOX) Fuel Fabrication Building, including the BMP, Aqueous Polishing Building (BAP), and the Shipping Receiving Building (BSR). Other construction activities included staging, welding, and mounting of process piping and installation of supports in the BAP and BMP; installation of ventilation system ductwork and supports in the BAP, BSR, and BMP; installation of cable trays and cable tray supports in the BAP, BSR, and BMP; installation of cables and conduit in the BAP, BSR, and BMP; installation of electrical switchgear in the BSR; installation of fire doors and dampers in the BAP and BMP; and installation of pellet storage gloveboxes in the BMP. The applicant continued to receive, store, assemble, and test gloveboxes and process equipment at the Process Assembly Facility (PAF).

### **2. Routine Resident Inspection Activities (Inspection Procedure (IP) 88130, Construction: Resident Inspection Program for On-Site Construction Activities at the Mixed Oxide Fuel Fabrication Facility; IP 88110, Quality Assurance: Problem Identification, Resolution, and Corrective Action); and IP 88134, Piping Systems Relied on for Safety)**

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

The inspectors routinely attended the applicant's construction plan-of-the-day meetings and engineering restraint meetings. The inspectors routinely held discussions with MOX Services design engineers, field engineers, quality assurance (QA) and quality control (QC) personnel, and subcontractor construction personnel, in order to maintain current knowledge of construction activities and any problems or concerns.

The inspectors routinely reviewed the status of work packages (WPs) maintained at various work sites. The inspectors monitored the status of WP completion to verify construction personnel obtained proper authorizations to start work, monitor progress, and to ensure WPs were kept up-to-date as tasks were completed.

The inspectors also observed proper communication in the work areas, observed that the work force was attentive, workers adhered to procedures, observed proper communication between supervisors and workers, observed that tanks containing various gasses were properly stored, and noted that hazardous materials were properly stored and/or properly controlled when in the field. The inspectors conducted routine tours of material storage and work areas to verify that materials and equipment were properly stored in accordance with QA requirements.

In addition, the inspectors conducted tours of material storage areas and warehouse facilities to determine if MOX Services was properly storing equipment and materials in accordance with MOX Project Quality Assurance Plan (MPQAP) storage requirements. Specifically, the inspectors verified that MOX Services' was implementing the material

storage requirements in Project Procedure (PP) 10-38, Storage and Control of Material, Revision (Rev.) 1.

The inspectors routinely reviewed various corrective action documents. The review included non-conformance reports (NCRs), condition reports (CRs), root causes, and supplier deficiency reports (SDRs). The inspectors also reviewed the closure of selected NCRs and CRs. The inspectors noted that the applicant entered issues identified during self-assessments into the corrective action system.

The inspectors routinely performed tours of the BMP, BAP, and BSR work areas to verify that MOX Services' staging of piping and installation of ductwork, gloveboxes, fire dampers and fire doors met regulatory commitments and procedural requirements.

The inspectors observed routine lifts conducted to position glovebox equipment such as generators, pumps, temporary lighting, and toolboxes. The lifts were conducted in accordance with the applicant's procedures. Specifically, the inspectors verified that installations of supports and gloveboxes were in accordance with applicable field drawings and met the general construction notes.

The inspectors observed installation of piping supports, ventilation supports, electrical conduit supports, and cable tray supports. The inspectors also observed placement of ventilation fan units, cable trays, electrical conduits, tanks, and electrical switchgear. The inspectors verified that the installations were in accordance with applicable installation work package guidance.

The inspectors performed reviews of WPs and routine walk-downs of the areas to verify adequate cleanliness. The inspectors performed routine walk-downs of installed piping and tanks to ensure cleanliness control barriers were properly maintained.

b. Conclusions

The inspectors routinely attended the applicant's construction plan-of-the-day meetings, reviewed the status of WPs maintained at various work sites, conducted routine tours of work and material storage areas, observed installation of mechanical equipment, and reviewed various corrective action documents to assess the adequacy of the MOX Services' corrective action program. Construction activities were performed in a safe and quality-related manner. No findings of significance were identified.

3. **PSSC Related Inspections**

a. PSSC-021, Fire Barriers

(1) Attributes: Procurement, Fabrication, Special Processes, and Installation (IPs 55050, Nuclear Welding, and 88136, Mechanical Components)

(a) Scope and Observations

The inspectors observed construction activities related to PSSC-021, Fire Barriers, as described in Table 5.6-1 of the MFFF Construction Authorization Request (CAR). The inspection attributes observed were procedure controls, special processes (welding),

and installation and the associated item relied on for safety (IROFS) components were fire dampers.

The inspectors reviewed receipt inspection reports and installation work orders to verify that fire dampers HSA\*DMPF0118C, HSA\*DMPF0149C, and MDE\*DMPF0103C were procured, received, fabricated, and installed in accordance with the requirements of 10 CFR Part 50 Appendix B, the licensee's quality assurance program, and work plans. The inspectors also performed a visual inspection of the fire dampers in the installed locations to verify that they were installed in accordance with the applicable drawings, specifications and American Welding Society code D9.1, Sheet Metal Welding.

(b) Conclusions

The inspectors reviewed records and inspected components related to PSSC-021, Fire Barriers, as described in Table 5.6-1 of the MFFF CAR. The inspection attributes observed were procurement, fabrication, and installation and the associated IROFS were fire dampers. No findings of significance were identified.

b. PSSC-023, Fluid Transport Systems

(1) Attributes: Procurement, Fabrication, and Special Processes, Installation (IP 55050, Nuclear Welding, IP 88134, Piping Relied on for Safety and IP 88136, Mechanical Components)

(a) Scope and Observations

The inspectors observed construction activities related to PSSC-023, Fluid Transport Systems, as described in Table 5.6-1 of the MFFF CAR. The inspection attributes observed were procurement, fabrication, special processes (welding), procedure controls, and installation and the associated IROFS components were process piping, demisters, pulse columns, and scrubbing columns.

During the inspection period, the applicant began welding piping and mounting piping in BAP room C-234 (active gallery). The inspectors observed QC inspections for cleanliness and fit up of the piping sections prior to welding, observed post welding QC inspections, and observed initial mounting of the welded sections to their associated supports (not final). Also during this period, the applicant re-initiated flushing and hydrostatic testing operations for various sections of piping. These evolutions had been suspended during the first quarter of 2014 to allow for procedure enhancements. The inspectors concluded that the procedure changes were acceptable. The inspectors concluded that piping installation (welding) and piping QC inspection activities were acceptable.

The inspectors reviewed receipt inspection reports and installation work orders to verify that demisters KCD\*DMST4030 and KPA\*DMST5210 were procured, received, fabricated, and installed in accordance with the requirements of 10 CFR Part 50 Appendix B and the licensee's quality assurance program. The inspectors also performed a visual inspection of demister KPA\*DMST5210 in the installed location to verify that the demister and supporting structural steel were made and installed in accordance with the applicable drawings and American Welding Society code, D1.6, Structural Welding Code – Stainless Steel, 1999 edition.

The inspectors reviewed receipt inspection reports and installation work orders to verify that scrubbing/pulse column KPA\*PULS3000 was procured, received, manufactured, and installed in accordance with the requirements of 10 CFR Part 50 Appendix B and the licensee's quality assurance program. The inspectors also performed a visual inspection of the scrubbing column in its installed location to verify it and the supporting structural steel were made and installed in accordance with the applicable drawings and American Welding Society code, D1.6, Structural Welding Code – Stainless Steel, 1999 edition.

(b) Conclusions

The inspectors observed construction activities related to PSSC-023, Fluid Transport Systems, as described in Table 5.6-1 of the MFFF CAR. The inspection attributes observed were procurement, fabrication, special processes (welding), procedure controls, and installation. The associated IROFS components were process piping, demisters, pulse columns, and scrubbing columns. The inspectors observed welding of piping sections in the BAP active gallery. The inspectors concluded that piping installation (welding) and piping QC inspection activities were acceptable. The inspectors also concluded that revisions to flushing and hydrostatic testing procedures were acceptable. No findings of significance were identified.

c. PSSC-024, Gloveboxes

(1) Attribute: Installation (IP 88136, Mechanical Components)

(a) Scope and Observations

The inspectors observed construction activities related to PSSC-024, Gloveboxes, as described in Table 5.6-1 of the MFFF CAR. The inspection attributes observed were procedure controls, special processes (welding), and installation. The inspectors continued to observe the progress of installation and procedure control activities associated with the Green Pellet Storage Unit (PSE) Shielding Door in accordance with WP 13-CP24-B117-PSE-GB1000/2000-M-001. Observations included alignment of the shielding and support welding activities on associated embed plates.

The inspectors also reviewed work package 12-CP24-B135-PSI GB1000-2000-M-0001 for weld records for field welds 1-18 and 121-125 on glovebox PSI\*GB1000/2000 to verify that the licensee adequately maintained traceability of welders and welding materials in long weld joints completed over several years.

The inspectors also continued to observe installation and welding activities associated with the following items relied on for safety (IROFS) components:

- 1) Green Pellet Storage Unit (PSE) glovebox (GB) in accordance with WP 13-CP24-B117-PSE-GB1000/2000-M-002 (installation of this unit is close to completion);
- 2) Scrap Pellet Storage Unit (PSI) glovebox in accordance with WP 13-CP24-B135-PSI-GB1000/2000-M-001 (pellet storage racks have been installed in this unit);
- 3) Rod Cladding Fabrication (GME) glovebox in accordance with WP 13-CP24-B264-GME-PE-M-001 (Internal cladding equipment is being installed in these units);
- 4) Ground Assorted Pellet Storage Unit (PSJ) glovebox in accordance with WP 13-CP24-B239-PSJ-PE-M-001;

- 5) Sintered Pellet Storage (PSF) Unit glovebox in accordance with WP 12-CP24-B129-PSF\*GB1000/2000-M-001 (a new contractor has just started to install this unit);
- 6) Inner Cap Opening Unit (KDA) glovebox in accordance with WP 13-CP24-KDA-EQ2000-PE-M-001;
- 7) Ball Milling Unit (KDM) glovebox in accordance with WP 13-CP24-B230-PE-M-003;
- 8) Pellet Transfer Units (PML) gloveboxes in accordance with WP 13-CP24-B104b-PE-M-002 (significant progress has been made in this area); and
- 9) KDM glovebox shells in room B230 in accordance with WP 14-CP24-B230-KDM-PE-M-001(these units are mounted and internal equipment is being installed).

Observations included, alignment of the gloveboxes, mounting of the gloveboxes to the floor mounts, and welding of the glovebox units.

(b) Conclusions

The inspectors observed construction activities and reviewed records related to PSSC-024, Gloveboxes, as described in Table 5.6-1 of the MFFF CAR. The inspection attributes observed were procedure controls, special processes and installation. The inspectors continued to observe installation, alignment of the shielding, welding and procedure control activities associated with the PSE Shielding Door in accordance with WP 13-CP24-B117-PSE-GB1000/2000-M-001.

The inspectors also continued to observe installation activities associated with the following components: PSE GB1000/2000, PSI GB1000/2000, GME glovebox, PSJ glovebox, PSF GB1000/2000, KDA GB2000, PML glovebox, and KDM GB4000. No findings of significance were identified.

**4. Programmatic Inspections**

- a. 10 CFR 70.72 Facility Change and Change Control Process (IPs 88106, Quality Assurance: Program Development and Implementation and 88107, Quality Assurance: Design and Documentation Control)

(1) Scope and Observations

The inspectors evaluated the implementation of MOX Services change processes for the License Application (LA) and the Integrated Safety Analyses Summary (ISAS) as defined in Chapter 16 of the LA. The summary of changes was provided in a letter to NRC dated January 27, 2014, and consisted of facility changes made since the last LA and ISAS update submitted to the NRC in May 2013.

Key elements of the inspection included the determination of the adequacy of the current program to meet licensing commitments, regulatory requirements, and perform evaluations required by the process on a case by case basis. Inspection focus was also on the effectiveness of the MOX change process program to maintain the safety basis of the facility due to changes and for determining the need for prior approval based on execution of the program and the requirements for requiring amendments for certain changes.

MOX Services defined its licensing basis configuration program in the following project procedures (PP):

- PP 8-6, Licensing Basis Configuration Management, Rev. 12, June 3, 2013, including Interim Change Notice (ICN) ICN-01 and ICN-02.
- PP 9-3, Design Control, Rev. 21, September 18, 2013, including ICN-01 and ICN-02.
- PP 8-2, Regulatory Commitments, Rev. 5, November 10, 2010, including ICN-01, ICN-02, ICN-03 and ICN-04.

The inspectors reviewed the summary list of changes provided by MOX Services in a letter to NRC dated January 27, 2014. The inspectors selected targeted samples from the summary list of facility changes which did not require pre-approval in accordance with 10 CFR 70.72 (d)(2) and Chapter 16 of the LA. The targeted samples were selected based on a variety of engineering disciplines (including fluid mechanics, ventilation, piping, chemical safety, criticality safety, fire safety, emergency power, structure, load handling, electrical power, the sintering furnace and digital instrumentation and controls) and changes with a higher degree of safety significance. The summary included changes to process safety information, the integrated safety analysis (ISA), and management measures. In addition, the summary included changes that potentially impacted the LA as discussed in revised LA Chapter 16.2.3.

The applicant's licensing staff was interviewed to obtain detailed information on the change process used by MOX Services and changes to the process since the last change process inspection. The change process included the PP8-6 evaluation procedure and evaluated whether changes could affect the design of the facility, components, or systems, licensing documents, or ISA related process safety information. Within the PP8-6 process is Form 1, Applicability Determination Form (ADF), to determine whether licensing documents have been affected and need to be evaluated, and Form 2, Licensing Evaluation Form, to determine whether prior approval of the change is needed by NRC. The inspectors reviewed PP 8-6 and the ICNs and determined the procedure, with the interim changes, to be adequate. The ADF was treated as a permanent QA record in accordance with the records retention requirements specified in PP 3-4, Records Management, Rev. 7.

The inspectors reviewed the targeted ADFs and verified that the change process outlined in Chapter 16 of the LA was performed by the applicant in accordance with project procedures and that the evaluations were properly screening changes in order to assure that the applicant's commitments related to the regulatory requirements of 10 CFR Part 70 have been met. The list of ADFs reviewed is provided in the attachment to this inspection report. The inspectors also interviewed engineering and licensing staff that were responsible for completing and reviewing the ADFs. The inspectors also verified that training was provided to MOX Services' staff involved with the facility change process.

The inspectors verified that MOX Services had a process for determining when deviations in the design of the facility need to be evaluated against commitments to codes and standards specified in licensing documents. The inspectors conducted interviews with design control staff to obtain information on the deviation control process.

The inspectors verified that the deviation control process specifically defined when changes to the design needed evaluation in the change control process. A log of the changes to determine whether PP 8-6 processing was needed was maintained and was part of the change process.

During the review of the targeted sample of ADFs completed by the applicant, the inspectors noted that in ADFs 00005534 and 00005671, the applicant made changes to the LA commitments pertaining to National Fire Protection Association (NFPA) 70 - 1999: National Electric Code (NEC) standard. The changes pertained to the following:

1. Percentage of fill for conductors with over two conductors installed in the conduit;
2. Number of over current devices in an electrical panel;
3. Power, control and instrument cable fills in trays;
4. Fill level of trays and wire-ways.

LA Section 7, Fire Protection, states that NFPA 70 – 1999, NEC, will be used for the selection of electrical equipment in gloveboxes to assure that the risk of electricity as an ignition source of fires and explosions is minimized. In addition, NFPA 70 provides the primary criteria used in the design of electrical power distribution to the gloveboxes to minimize the risk of electricity as an ignition source of fires and explosions. Electrical power provided to the glovebox equipment is designed and installed according to the requirements of NFPA 70.

The inspectors noted that NFPA-70, Annex H, Administration and Enforcement, Section 80.13 (15) and (16) states that (1) the authority having jurisdiction (AHJ) is permitted to waive specific requirements or permit alternative methods where it can be assured that equivalent objectives can be achieved by establishing and maintaining effective safety and (2) technical documentation shall be available to demonstrate equivalency or an application for a waiver shall be prepared and filed with the AHJ. Section 7.1 of the LA indicates that the AHJ for licensed activities is the U.S. Nuclear Regulatory Commission.

The documentation contained in ADFs 00005534 and 00005671 evaluated the changes against the criteria contained in Chapter 16 of the LA and 10 CFR 70.61. However, the inspectors noted that the changes to commitments to NFPA-70 as stated in the LA, also needed to be evaluated in accordance with NFPA 70-1999. This requirement includes either an equivalency analysis or a waiver request if an equivalency case cannot be demonstrated. The inspectors discussed this discrepancy with the applicant and determined that more information is required from the applicant to determine if it is acceptable or if it constitutes a violation of LA requirements. Information needed from the applicant includes equivalency evaluations for changes to NFPA 70-1999 commitments. The inspectors identified unresolved item (URI) 70-3098/2014-02-01, Review of equivalency evaluations for changes to NFPA 70-1999 commitments.

(2) Conclusions

The change process, as outlined in Chapter 16 of the LA, was performed by the applicant in accordance with project procedures. Training provided to MOX Services' staff involved with the facility change process was adequate. The inspectors had reasonable assurance that the evaluations properly screened changes to assure that the applicant's commitments related to the regulatory requirements of 10 CFR Part 70 were

met. URI 70-3098/2014-02-01, Review of equivalency evaluations for changes to NFPA 70-1999 commitments, was identified.

**5. Follow-up on Previously Identified Items**

a. (Closed) VIO 70-3098/2012-04-01, Failure to Inspect Internal Root Passes of Field Welds

(1) Scope and Observations

The inspectors reviewed corrective action documents associated with violation 70-3098/2012-04-01 which concerned incomplete penetration of ductwork welding, PSSC-005. Specifically the inspectors reviewed CRs 12-548 and 13-406, and NCR 13-482 to determine if the corrective actions adequately addressed the concern. The corrective actions included the addition of hold points and written instructions to ensure that future welds get inspected while the root is still accessible. For already completed welds that were brought into question by the violation, the licensee performed volumetric nondestructive examinations and addressed the nonconforming welds on a case by case basis in NCR 13-482. The inspectors selected three welds that were found to be deficient to verify adequate corrective actions. Welds 11-CP23-BMP0106-HSA46-D-M-0003 FW031 (item 261) and 11-CP23-BMP0105-MDE35-D-M-0001 FW055 (item 20) were classified as use-as-is and the inspectors reviewed the disposition and written technical justification to verify that the welds could perform their IROFS function as-is. Weld number 11-CP23-BMP0105-MDE35-D-M-0001 FW032 (item 12) was repaired and the inspectors reviewed the work package and also performed a direct visual examination of the repair welds to verify that they were made in accordance with the design drawings and the American Welding Society code, D9.1, Sheet Metal Welding.

(2) Conclusions

VIO 70-3098/2012-04-01, Failure to Inspect Internal Root Passes of Field Welds, was closed based on the documents reviewed and the direct observations of repairs to the sampled welds.

b. (Closed) VIO 70-3098/2010-02-03, Welding Process Control Problems

(1) Scope and Observations

The inspectors reviewed corrective action documents associated with violation 70-3098/2010-02-03, which concerned welding of gloveboxes (PSSC-024) at the Flanders vendor facility. The inspectors reviewed CR 10-414, QA Surveillance Report SR-FFI-10-VS253, and Flanders Response to NRC Inspection Report Violation # - (70-3098/2010-002-003) to determine if the corrective actions were sufficient to ensure that the specific gloveboxes would meet their IROFS function and a proper response for Flanders to remain on the MOX approved suppliers list. Corrective actions at the Flanders facility included individual repairs, procedure revisions, and training, and the licensee performed increased oversight and additional surveillances to verify that Flanders was fabricating IROFS gloveboxes in accordance with their quality assurance program.



(2) Conclusions

VIO 70-3098/2010-02-03, Welding Process Control Problems, was closed based on the documents reviewed.

6. **Exit Interviews**

The inspection scope and results were summarized throughout this reporting period and on July 10, 2014. Dissenting views were not expressed by the applicant. Although proprietary documents and processes may have been reviewed during this inspection, the proprietary nature of these documents or processes was not included in this report.

## SUPPLEMENTAL INFORMATION

### 1. PARTIAL LIST OF PERSONS CONTACTED

R. Alley, Engineering Assurance Manager  
H. Chavous, Vice President, Project Services  
M. Gober, Vice President, Engineering  
D. Gwyn, Licensing/Nuclear Safety Manager  
D. Ivey, Project Assurance Manager  
D. Kehoe, Quality Assurance/Quality Control Manager  
J. Keklak, Quality Assurance Manager  
S. King, Vice President, Operations  
M. Maier, Engineering (Commercial Grade Dedication)  
D. Pike, Area Construction Manager  
E. Radford, Regulatory Compliance  
S. Saltzman, Nuclear Safety Engineer  
L. Wood, Regulatory Compliance Manager  
D. Yates, Licensing Engineer

### 2. INSPECTION PROCEDURES (IPs) USED

IP 88106      Quality Assurance: Program Development and Implementation  
IP 88107      Quality Assurance: Design and Documentation Control  
IP 88110      Quality Assurance: Problem Identification, Resolution, and  
                    Corrective Action  
IP 88130      Resident Inspection Program For On-Site Construction  
                    Activities at the Mixed-Oxide Fuel Fabrication Facility  
IP 88134      Piping Systems Relied on for Safety  
IP 88136      Mechanical Components  
IP 55050      Nuclear Welding General Inspection Procedure

### 3. LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

<u>Item Number</u>	<u>Status</u>	<u>Description</u>
URI 70-3098/2014-02-01	Open	Review of equivalency evaluations for changes to NFPA 70 - 1999 commitments (Section 4.a).
VIO 70-3098/2012-04-01	Closed	Failure to Inspect Internal Root Passes of Field Welds (Section 5.a).
VIO 70-3098/2010-02-03	Closed	Welding Process Control Problems (Section 5.b).

#### 4. **LIST OF PSSCs REVIEWED**

PSSC-021	Fire Barriers
PSSC-023	Fluid Transport Systems
PSSC-024	Gloveboxes

#### 5. **LIST OF ACRONYMS USED**

ADAMS	Agency-Wide Document Access and Management System
ADF	Applicability Determination Form
AHJ	Authority Having Jurisdiction
BAP	Aqueous Polishing Building
BMP	MOX Processing Building
BSR	Shipping and Receiving Building
CAR	Construction Authorization Request
CFR	Code of Federal Regulations
CPB1	Construction Projects Branch 1
CR	Condition Report
DCP	Division of Construction Projects
GB	Glovebox
GME	Rod Cladding Fabrication
ICN	Interim Change Notice
IP(s)	Inspection Procedure(s)
IROFS	Items Relied on for Safety
ISA	Integrated Safety Analysis
KDA	Inner Cap Opening Unit
KDM	Ball Milling Unit
LA	License Application
MFFF	MOX Fuel Fabrication Facility
MOX	Mixed Oxide
MOX Services	Shaw AREVA MOX Services
MPQAP	MOX Project Quality Assurance Plan
NCR	Non-Conformance Report
NEC	National Electric Code
NRC	Nuclear Regulatory Commission
PAF	Process Assembly Facility
PML	Pellet Transfer Units
PP	Project Procedure
PSE	Green Pellet Storage Unit
PSF	Sintered Pellet Storage
PSI	Scrap Pellet Storage Unit
PSJ	Ground Assorted Pellet Storage Unit
PSSC(s)	Principle System(s), Structure(s), and Component(s)
QA	Quality Assurance
QC	Quality Control
QL	Quality Level
QL-1	Quality Level 1
RII	Region II
Rev.	Revision
SDR(s)	Supplier Deficiency Report(s)
URI	Unresolved Item
WP(s)	Work Package(s)

## 6. RECORDS AND DOCUMENTS REVIEWED

### Applicability Determination Forms (ADFs)

ADF# 005432	ADF# 005494	ADF# 005564	ADF# 005641
ADF# 005434	ADF# 005500	ADF# 005565	ADF# 005644
ADF# 005438	ADF# 005502	ADF# 005568	ADF# 005669
ADF# 005441	ADF# 005503	ADF# 005581	ADF# 005670
ADF# 005443	ADF# 005504	ADF# 005589	ADF# 005671
ADF# 005444	ADF# 005505	ADF# 005590	ADF# 005673
ADF# 005445	ADF# 005511	ADF# 005595	ADF# 005674
ADF# 005448	ADF# 005517	ADF# 005598	ADF# 005676
ADF# 005453	ADF# 005518	ADF# 005599	ADF# 005677
ADF# 005461	ADF# 005529	ADF# 005605	ADF# 005687
ADF# 005464	ADF# 005531	ADF# 005607	ADF# 005690
ADF# 005465	ADF# 005534	ADF# 005612	ADF# 005695
ADF# 005469	ADF# 005545	ADF# 005616	ADF# 005697
ADF# 005475	ADF# 005549	ADF# 005621	ADF# 005698
ADF# 005481	ADF# 005559	ADF# 005627	ADF# 005713
ADF# 005484	ADF# 005561	ADF# 005630	

### Condition Reports

CR 10-414  
CR 12-548  
CR 13-406

### Engineering Change Requests

ECR-022002

### Nonconformance Reports

NCR 13-4822

### Receipt Inspection Reports (RIRs)

QC-RIR-13-43627  
WC-RIR-13-47927  
QC-RIR-13-48863  
WC-RIR-14-49642  
QC-RIR-12-31061  
QC-RIR-14-1372 NCR EN-13-3905

### Surveillance Reports

QA-SR-FFI-10-VS253

Work Orders/Packages

Work Order 13-CP27-C134-KCD-DMST4030-M-000, Weld Doc # 1306559 Rev. 01

Work Order 13-CP27-C234-KPA-DMST5210-01C, Weld Doc # 1309119 Rev. 0

Work Order 14-CP27-C145-KPA-PULS3000-M-0001, Weld Doc #1400729 Rev. 0

Work Package 13-CP23-C118-HAS-T-M-0001

Work Package 13-CP23-C149-HAS-T-M-0001

Work Package 13-CP23-C103-MDE-L-T-M-0001

Work Package 12-CP24-B135-PSI GB1000-2000-M-0001

Work package 11-CP23-BMP0106-HSA46-D-M-0003