



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

April 23, 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 70-3098/2014-001

Dear Mr. Trice:

During the period from January 1 through March 31, 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 70-3098/2014-001  
w/attachment: Supplemental Information

cc w/encl: (See next page)

cc w/encl:

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Savannah River Site  
P.O. Box 7097  
Aiken, SC 29804-7097

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

Sincerely,

**/RA/**

Deborah A. Seymour, Chief  
Construction Projects Branch 1  
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 ACCESSION NUMBER: ML14114A288     
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 ☒ FORM 665 ATTACHED

OFFICE	RII: DCP	RII: DCP					
SIGNATURE	WBG	MXS1					
NAME	W. Gloersen	M. Shannon					
DATE	04/23/2014	04/23/2014					
E-MAIL COPY?	YES	YES	YES				

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Letter to Kelly Trice from Deborah Seymour dated April 23, 2014.

SUBJECT: MIXED OXIDE FUEL FABRICATION FACILITY- NRC INSPECTION REPORT  
NUMBER 70-3098/2014-001

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**U.S. NUCLEAR REGULATORY COMMISSION**

**REGION II**

Docket No.: 70-3098

Construction  
Authorization No.: CAMOX-001

Report No.: 70-3098/2014-001

Applicant: Shaw AREVA MOX Services

Location: Savannah River Site  
Aiken, South Carolina

Inspection Dates: January 1 – March 31, 2014

Inspectors: M. Shannon, Senior Resident Inspector, Construction Projects Branch 1  
(CPB1), Division of Construction Projects (DCP), Region II (RII)

Accompanying  
Personnel: D. Seymour, Branch Chief, CPB1, DCP, RII

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 70-3098/2014-001

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 included 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-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 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 installation activities associated with the following items relied on for safety (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.a)

## **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 and finishing activities related to wall, ceiling and floor surfaces of the Mixed Oxide (MOX) Fuel Fabrication Building, including the MOX Processing Building (BMP), Aqueous Polishing Building (BAP), and the Shipping Receiving Building (BSR). Other construction activities included staging of process piping and installation of supports in the BAP, BSR, 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 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 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-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 observed 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 welding activities to associated embed plates.

The inspectors also observed 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;
- 2). Scrap Pellet Storage Unit (PSI) glovebox in accordance with WP 13-CP24-B135-PSI-GB1000/2000-M-001;
- 3). Rod Cladding Fabrication (GME) glovebox in accordance with WP 13-CP24-B264-GME-PE-M-001;
- 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;
- 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). KDM glovebox shells in room B230 in accordance with WP 14-CP24-B230-KDM-PE-M-001; and
- 9). Pellet Transfer Units (PML) gloveboxes in accordance with WP 13-CP24-B104b-PE-M-002.

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 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 observed 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-002.

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

**4. Exit Interviews**

The inspection scope and results were summarized throughout this reporting period, by the resident inspector on April 3, 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  
T. Callahan, Mechanical Engineer  
W. Christman, Mechanical Engineer  
B. Dannehmman, Welding Engineer  
M. Gober, Vice President, Engineering  
D. Gwyn, Licensing/Nuclear Safety Manager  
D. Ivey, Quality Assurance Manager  
R. Justice, Jr., Quality Assurance Programs Manager  
G. Keenan, Mechanical Engineer  
D. Kehoe, Quality Assurance/Quality Control Manager  
J. Keklak, Regulatory Compliance Manager  
S. King, Vice President, Operations  
T. MacGruder, Welding Engineer  
M. Maier, Engineering (Commercial Grade Dedication)  
S. Marr, Executive Vice President and Deputy Project Manager  
M. Mohundro, Quality Assurance  
J. Peregoy, Quality Control Manager  
F. Pinkston, Employee Concerns Program Manager  
D. Pittman, Mechanical Engineer  
E. Radford, Regulatory Compliance  
L. Rosenbloom, Fire Protection Engineer  
B. Stephens, Vice President, Process Unit Design and Commissioning  
K. Trice, President and Chief Operating Officer  
K. Trosen, Welding Engineer  
R. Warren, Fire Protection Engineer  
J. White, Lead Auditor  
R. Whitley, Vice President, Project Assurance  
D. Yates, Licensing Engineer

### **2. INSPECTION PROCEDURES (IPs) USED**

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

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

No items were opened, closed, or discussed.

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

PSSC-024	Gloveboxes
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## 5. **LIST OF ACRONYMS USED**

ADAMS	Agency-Wide Document Access and Management System
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
IP(s)	Inspection Procedure(s)
IROFS	Items Relied on for Safety
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
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
SDR(s)	Supplier Deficiency Report(s)
WP(s)	Work Package(s)