



UNITED STATES  
NUCLEAR REGULATORY COMMISSION

REGION II  
SAM NUNN ATLANTA FEDERAL CENTER  
61 FORSYTH STREET, SW, SUITE 23T85  
ATLANTA, GEORGIA 30303-8931

April 24, 2007

Mr. David Stinson  
MOX Services President and Project Manager  
Shaw AREVA MOX Services  
Savannah River Site  
P.O. Box 7097  
Aiken, South Carolina 29804-7097

SUBJECT: MIXED OXIDE FUEL FABRICATION FACILITY - NRC INSPECTION REPORT  
NO. 07003098/2007001

Dear Mr. Stinson:

This refers to the inspection conducted from January 1 through March 31, 2007, concerning the Mixed Oxide Fuel Fabrication Facility (MFFF) construction site. The enclosed inspection report documents the inspection results, which were discussed on April 10, 2007, with Mr. D. Gwyn and other members of your staff.

The inspection 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 inspector reviewed selected procedures and records, observed activities, and interviewed personnel.

Based on the results of this inspection, no violations or deviations were identified.

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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 70-3098/2007-001

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**U.S. NUCLEAR REGULATORY COMMISSION**

**REGION II**

Docket No.: 70-3098

Construction  
Authorization No.: CAMOX-001

Report No.: 70-3098/2007-001

Certificate Holder: Shaw AREVA MOX Services

Location: Savannah River Site  
Aiken, South Carolina

Inspection Dates: January 1 - March 31, 2007

Inspector: Melvin C. Shannon, Senior Resident Inspector  
Division of Construction Projects

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

Enclosure

## **EXECUTIVE SUMMARY**

Shaw AREVA MOX Services  
Mixed Oxide Fuel Fabrication Facility  
NRC Inspection Report No. 70-3098/2007-001

This routine inspection included activities conducted by the Senior Resident Inspector during normal shifts and involved the observation and evaluation of the certificate holder's programs for quality assurance, vendor audits, corrective actions and geotechnical/foundation activities. The inspection identified the following aspects of the certificate holder's programs as outlined below:

### **Geotechnical/Foundation Activities**

- Site preservation activities related to installation of mud mats were conducted in accordance with the construction authorization conditions and the certificate holder's Quality Assurance (QA) program. Procedures were established and followed for strength testing of the concrete mud mat in accordance with the certificate holder's QA program. The certificate holder's records retention program properly maintained QA records. No findings of significance were identified (Section 2).

### **Vendor/Supplier Audit Activities**

- The certificate holder was performing adequate oversight of the vendor/supplier QA program and related activities (Section 3).

### **Resident Inspection Program for On-Site Construction Activities**

- The certificate holder was promptly documenting conditions adverse to quality into the corrective action program (Section 4).
- Although the certificate holder had provided specific guidance regarding material documentation necessary for shipment and receipt of material to the supplier during the QA assessment, the supplier was still having difficulty providing the correct documentation (Section 4).
- The certificate holder was supporting a strong receipt inspection effort to ensure that deficiencies were promptly identified and resolved prior to the start of construction activities (Section 4).

#### **Attachment:**

Persons Contacted

Inspection Procedures

List of Items Opened, Closed, and Discussed

List of Acronyms Used

List of Documents Reviewed

## **REPORT DETAILS**

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

The certificate holder's oversight of the preparations and implementation of site preservation activities (including installation of the mud mat, testing of concrete specimens, vendor audits, and receipt of material) continued throughout this reporting cycle. The site preservation activities were performed by a Department of Energy (DOE) contractor and monitored by MOX Services Quality Assurance (QA)/Quality Control (QC) personnel.

### **2. Geotechnical/Foundation Activities (Inspection Procedure (IP) 88131)**

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

During the inspection period, the certificate holder continued with site preservation activities and completed installation of the mud mats, applied protective coatings on the excavation slopes and installed curbs and drains to protect the slopes. The inspector reviewed the mud mat installation activities and the related concrete strength testing activities to ensure that they were accomplished in accordance with the construction authorization (CA). The certificate holder's activities were conducted in accordance with the approved QA program and the Mixed Oxide (MOX) Project Quality Assurance Plan (MPQAP); QA program policies and procedures were established and implemented for items and services important to safety; the certificate holder's system for preparing and maintaining records was functioning properly. The inspector maintained a current knowledge of the status of construction activities.

The inspector observed installation of the mud mats, observed initial concrete testing (slump, air entrainment, and temperature) and reviewed additional test records, and observed both the 7-day and 30-day concrete strength tests and reviewed additional strength testing records. The inspector also reviewed the qualification records for selected test personnel. The inspector verified that the certificate holder's procedural guidance was appropriate for these activities. The inspector verified that test results met procedural requirements, test personnel were qualified to perform associated testing activities and test results were appropriately entered into the certificate holder's document control system.

The inspector reviewed the applicable sections of the certificate holder's QA program and verified that mud mat activities were conducted in accordance with the program. Specifically, the inspector verified that the procedural guidance had been established, reviewed, and approved in accordance with the QA program. The inspector routinely held discussions with various MOX Services individuals and attended various MOX Services status meetings in order to maintain current knowledge of construction activities.

#### **b. Conclusions**

Site preservation activities related to mud mat installation were conducted in accordance with the certification conditions and the certificate holder's QA program; procedures were established in accordance with the certificate holder's program; procedures were

followed; and the certificate holder's records retention program properly maintained QA records. No findings of significance were identified.

**3. Supplier/Vendor Inspection (IP 88115)**

a. Scope and Observations

The inspector observed the certificate holder's audits and surveillances of the re-bar supplier and the prospective concrete supplier. The intent of the certificate holder's audits and surveillances was to ensure that the suppliers had established QA programs and corrective action programs. The inspector verified that the certificate holder was providing acceptable oversight of the vendor's QA activities. The inspection was conducted by observing the certificate holder's QA auditors during discussions with the suppliers and by the inspector having various independent discussions with supplier personnel. The inspector also reviewed previous QA audit reports of these suppliers.

The inspector reviewed Audit Report EAP-06-VE10, "Supply of Materials Including Embedded Pipe, Re-bar and Re-bar Fabrication." This audit was conducted at Energy & Process located in Tucker, Georgia (GA). The audit found that the supplier's QA program met the requirements of 10 CFR 50 Appendix B and American Society of Mechanical Engineers (ASME) NQA-1. The report noted that the supplier's QA program was very mature and that the company had been providing materials and components to the commercial nuclear industry for more than 20 years. The inspector noted that the audit scope was detailed and included all of the appropriate QA program criteria.

The inspector observed the certificate holder's QA surveillance of the re-bar manufacturer in Columbia, South Carolina (SC) on January 3, 2007. The surveillance verified that the supplier had adequate experience, was maintaining an appropriate QA program, was meeting the material strength specified in the purchase order, had a program in place to perform required strength testing, and had appropriate splices and related testing identified in the program. The inspector held independent discussions with the supplier's fabrication personnel, fabrication management and supplier QA personnel. The inspector noted that the personnel were knowledgeable of the QA requirements for test and fabrication records and the importance of providing quality products. The certificate holder's QA surveillance found no major discrepancies at the re-bar manufacturer's facility.

The inspector also observed the certificate holder's QA audit of a prospective concrete supplier in Jackson, SC on March 1, 2007. The intent of the audit was to determine if the prospective concrete supplier could meet the requirements established in the Request for Proposal for supplying Quality Level (QL) - 1 concrete. The certificate holder's audit identified five deficiencies. One of the deficiencies noted that the supplier's QA Program did not meet the requirements of 10 CFR 50, Appendix B and ASME NQA-1-1994. The inspector toured the concrete mixing plant site and held discussions with a concrete supplier QA representative. The tour noted that the plant site was not ready at this time to provide QL-1 concrete. The certificate holder's discussions with the concrete supplier representative noted that the individual was very knowledgeable of NQA-1 requirements. The certificate holder's audit was documented in Audit Report LaF-07-VE17.

b. Conclusions

The certificate holder was performing acceptable oversight of vendor/supplier QA program and related activities. No items of significance were identified in the certificate holder's vendor/supplier QA audit program.

**4. Resident Inspection Program for On-Site Construction Activities (IP 88130)**

a. Scope and Observations

The inspector reviewed the certificate holder's program for documenting conditions adverse to quality in the area of material receipt at the MOX site. During this inspection period, the certificate holder was receiving re-bar material from the supplier (Energy & Process). The inspector observed several receipt inspections performed by the certificate holder's QA/QC organization to verify the adequacy of the receipt inspection and to verify that deficiencies were promptly and adequately documented.

The inspector noted that the certificate holder had documented several non-conformance reports associated with the receipt of QL-1 re-bar from the supplier (Energy & Process Corporation). Non-conformance Report (NCR) QC-07-0001 noted that physical and chemical test records were missing and bundles did not have proper fabrication tags. NCR QC-07-002 noted that the Bill of Lading did not match the material received in that the number of pieces was incorrect. NCR QC-07-003 noted that two re-bar shipments were found to be damaged during the receipt inspection. NCR QC-07-004 noted that the re-bar had been improperly stored in that the re-bar was touching the ground. NCR QC-07-005 noted that the heat number was missing and the heat number on another bundle did not match the Certificate of Conformance. NCR QC-07-006 was similar to 07-005. NCR QC-07-007 noted that the wall dowels listed on the bill of lading did not exist on the wall dowel drawings. NCR QC-07-008 was similar to 07-007. NCR QC-07-009 was similar to 07-003. NCR QC-07-010 was similar to 07-002. Although the various issues were subsequently resolved, the number and type of problems indicated that the certificate holder needed to maintain a strong QA/QC oversight of the materials receipt program.

No items of significance were identified in the certificate holder's material receipt inspection program.

b. Conclusions

The inspector noted that the certificate holder was promptly documenting conditions adverse to quality into the corrective action program. The inspector noted that although the certificate holder had provided guidance regarding material documentation necessary for shipment and receipt of material to the supplier during the QA surveillance, the supplier was still having difficulty providing the correct documentation. The certificate holder was supporting a strong receipt inspection effort to ensure these issues were promptly identified and resolved prior to the start of construction activities.

**5. Exit Interview**

The inspection scope and results were presented to members of the certificate holder's management at various meetings throughout the inspection period and were summarized on April 10, 2007. Although proprietary documents and processes may have been reviewed during this inspection, the proprietary nature of these documents or processes were deleted from this report. No dissenting comments were received from the certificate holder.

## **1. PARTIAL LIST OF PERSONS CONTACTED**

### Certificate Holder Personnel

J. Adair, Civil - Mechanical Engineering Manager  
P. Bishop, Construction Supervisor  
D. Gwyn, Regulatory Affairs Manager  
R. Justice, Quality Assurance Engineer  
J. King, Construction Supervisor  
D. Leach, Deputy Director, MFFF Project  
G. Shell, QA Manager  
D. Stinson, President and Chief Operating Officer  
J. Vaughn, Civil Engineer

### Department of Energy

S. Glenn, National Nuclear Security Administration (NNSA)

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

IP 88115      Supplier/Vendor Inspection  
IP 88130      Resident Inspection Program for On-Site Construction Activities at the  
                  Mixed Oxide Fuel Fabrication Facility  
IP 88131      Geotechnical/Foundation Activities

## **3. LIST OF ACRONYMS USED**

ASME	American Society of Mechanical Engineers
CA	Construction Authorization
DOE	Department of Energy
GA	Georgia
IP	Inspection Procedure
MFFF	MOX Fuel Fabrication Facility
MOX	Mixed Oxide
MPQAP	MOX Project Quality Assurance Plan
NCR	Nonconformance Report
NNSA	National Nuclear Security Administration
QA	Quality Assurance
QC	Quality Control
QL-1	Quality Level 1
SC	South Carolina

4. **LIST OF DOCUMENTS REVIEWED**

**Specifications & Procedures**

Construction Specification Section 02310, Excavation, Backfilling, and Compaction for Structures, Specification DCS01-WRT-DS-SPE-B-09304-0, dated October 4, 2005

**Drawings**

Drawing number DCS01-XGP-DS-PLG-G-00266, MOX Fuel Fabrication Facility Overall Plot Plan, Revision 1

**Miscellaneous Documents**

Basis of Design for Site/Geotechnical, DCS01-AAJ-DS-DOB-B-40102-E

Mixed Oxide Fuel Fabrication Facility Construction Authorization Request, Docket No. 70-3098 (latest revision)

Mixed Oxide Fuel Fabrication Facility Integrated Safety Analysis Summary, Docket No. 70-3098

Mud Mat Concrete Checklist

NUREG-1767, Volume 1, Environmental Impact Statement on the Construction and Operation of a Proposed Mixed Oxide Fuel Fabrication Facility at the Savannah River Site, South Carolina

NUREG-1767, Volume 2, Environmental Impact Statement on the Construction and Operation of a Proposed Mixed Oxide Fuel Fabrication Facility at the Savannah River Site, South Carolina

NUREG-1821, Final Safety Evaluation Report on the Construction Authorization Request for the Mixed Oxide Fuel Fabrication Facility at the Savannah River Site, South Carolina, Docket No. 70-3098, March 2005