



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

January 25, 2018

Mr. David Del Vecchio  
President and Chief Operating Officer  
CB&I AREVA MOX Services  
Savannah River Site  
P.O. Box 7097  
Aiken, SC 29804-7097

SUBJECT: MIXED OXIDE FUEL FABRICATION FACILITY- NRC INSPECTION REPORT  
NUMBER 70-3098/2017-004

Dear Mr. Del Vecchio:

During the period from October 1, 2017, through December 31, 2017, 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 and license application 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 and license application 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 construction activities, and interviewed personnel.

Based on the results of this inspection, no violations or deviations were identified. In accordance with 10 CFR 2.390 of NRC's "Rules of Practice and Procedure," a copy of this letter and its enclosure 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/**

Michael Ernstes, Chief  
Construction Inspection Branch 3  
Division of Construction Oversight

Docket No. 70-3098

Construction Authorization No.: CAMOX-001

Enclosure: NRC Inspection Report No. 70-3098/2017-004  
w/attachment: Supplemental Information

cc w/encl: (See next page)

cc w/encl:

Mr. Scott Cannon  
Federal Project Director  
NA-262.1  
P.O. Box A  
Aiken, SC 29802

Ms. Joyce Connery, Chairman  
Defense Nuclear Facilities Safety Board  
625 Indiana Ave., NW, Suite 700  
Washington, DC 20004

Ms. Susan Jenkins  
Division of Radioactive Waste Management  
Bureau of Health and Environmental Control  
2600 Bull St.  
Columbia, SC 29201

Ms. Kathryn M. Sutton  
Morgan, Lewis, & Bockius  
1111 Penn. Ave., NW  
Washington, DC 20004

Ms. Diane Curran  
Harmon, Curran, Spielburg and Eisenberg, LLP  
1726 M St., NW  
Suite 600  
Washington, DC 20036

Ms. Glenn Carroll  
Nuclear Watch South  
P.O. Box 8574  
Atlanta, GA 30306

Mr. Lewis Zeller  
Blue Ridge Environmental Defense League  
P.O. Box 88  
Glendale Springs, NC 28629

Mr. Dealis Gwyn, Licensing Manager  
CB&I AREVA MOX Services  
Savannah River Site  
P.O. Box 7097  
Aiken, SC 29804-7097  
Letter to D. Del Vecchio from Michael Ernstes

SUBJECT: MIXED OXIDE FUEL FABRICATION FACILITY- NRC INSPECTION REPORT  
NO. 70-3098/2017-004

Distribution w/encl:

R. Johnson, NMSS  
D. Tiktinsky, NMSS  
M. Diaz, NMSS  
W. Jones, RII  
S. Walker, RII  
M. Ernstes, RII  
J. Heisserer, RII  
N. Coover, RII  
J. Eargle, RII  
P. Carman, RII  
PUBLIC

☒ PUBLICLY AVAILABLE ☐ NON-PUBLICLY AVAILABLE ☐ SENSITIVE ☒ NON-SENSITIVE

ADAMS: ☒ Yes ACCESSION NUMBER: **ML18025C019** ☒ SUNSI REVIEW COMPLETE ☒ FORM 665 ATTACHED

OFFICE	RII: DCO	RII: DCO	RII: DCO	RII: DCO	RII: DCO	RII: DCO	HQ: NMSS	RII:DCO
SIGNATURE	<b>Via email</b>	<b>Via email</b>	<b>Via email</b>	<b>Via email</b>	<b>Via email</b>	<b>Via email</b>	<b>Via email</b>	<b>ME</b>
NAME	P. Carman	J. Eargle	N. Karlovich	J. Kent	D. Piccirillo	C. Taylor	D. Tiktinsky	M. Ernstes
DATE	1/16/18	1/16/18	1/16/18	1/17/18	1/16/18	1/22/18	1/24/2018	01/25/2018

Enclosure

**U.S. NUCLEAR REGULATORY COMMISSION**

**REGION II**

Docket No.: 70-3098

Construction  
Authorization No.: CAMOX-001

Report No.: 70-3098/2017-004

Applicant: CB&I AREVA MOX Services

Location: Savannah River Site  
Aiken, South Carolina

Inspection Dates: October 1 – December 31, 2017

Inspectors: P. Carman, Construction Project Inspector, Construction  
Inspection Branch 2 (CIB2), Division of Construction  
Oversight (DCO)  
J. Eargle, Senior Project Inspector, Construction Inspection  
Branch 3 (CIB3), DCO  
N. Karlovich, Construction Resident Inspector, CIB3, DCO  
J. Kent, Construction Inspector, Construction Inspection Branch 4  
(CIB4), DCO  
D. Piccirillo, Senior Construction Inspector, CIB2, DCO  
C. Taylor, Senior Construction Inspector, CIB4, DCO

Accompanying Personnel: M. Diaz, Project Manager, Fuel Manufacturing Branch (FMB),  
Division of Fuel Cycle Safety and Environmental Review  
(FCSE), Office of Nuclear Materials Safety and Safeguards  
(NMSS)  
M. Ernstes, Branch Chief, CIB3, DCO  
W. Gloersen, Senior Project Inspector, CIB3, DCO  
D. Tiktinsky, Senior Project Manager, FMB, FCSE, NMSS

Approved by: Michael Ernstes, Chief  
Construction Inspection Branch 3  
Division of Construction Oversight

Enclosure

## **EXECUTIVE SUMMARY**

CB&I AREVA MOX Services (MOX Services)  
Mixed Oxide (MOX) Fuel Fabrication Facility (MFFF)  
NRC Inspection Report (IR) Number (No.) 70-3098/2017-004

The scope of the inspections encompassed a review of various MFFF activities related to Quality Level (QL)-1 (safety-related) construction for conformance to U.S. Nuclear Regulatory Commission (NRC) regulations, the Construction Authorization Request (CAR), the MOX Project Quality Assurance Plan (MPQAP), applicable sections of the License Application (LA) and applicable industry codes and standards. This inspection included, as applicable, the following inspection attributes: 10 CFR 21 – construction, corrective action program, and procedures.

The following principal systems, structures and components (PSSCs) are discussed in this inspection report:

- PSSC-012, Emergency AC Power System
- PSSC-024, Glovebox
- PSSC-041, Process Cells
- PSSC-048, Sintering Furnace

### **Routine Resident Inspections**

The inspectors routinely reviewed the applicant's weekly construction status package, reviewed the status of work packages maintained at various work sites, conducted daily 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-012, Emergency AC Power System**

The inspectors witnessed emergency diesel generator (EDG) #1 being delivered, unloaded, and placed into storage at the Barnwell warehouse. The inspectors reviewed critical lift records, procedures, and corrective action documents associated with the work activities. No findings of significance were identified. (Section 3.a)

### **Programmatic Inspections**

#### **Quality Assurance: Problem Identification, Resolution and Corrective Action**

For the samples selected for this inspection, measures implemented by the applicant provided reasonable assurance that conditions adverse to quality were promptly identified and corrected. Documentation and reporting of conditions adverse to quality were performed in accordance with procedures and specifications.

The inspectors also determined that the applicant had a functioning Employee Concerns Program and interviews indicated that management communications and training have emphasized the importance of maintaining a safety conscious work environment. All of the employees interviewed in this inspection exhibited a willingness to raise issues that may arise with workplace safety or nuclear quality assurance. (Section 4.a)

#### 10 CFR, Part 21, Inspection-Facility Construction

The inspectors evaluated several 10 CFR Part 21 evaluations completed by the applicant against the quality assurance program to determine whether the applicant's procedures and program activities effectively implement the requirements of 10 CFR Part 21. No findings of significance were identified. (Section 4.b)

## **REPORT DETAILS**

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

During the inspection period, the applicant (CB&I AREVA MOX Services (MOX Services)) continued construction activities of principal systems, structures and components (PSSCs). Other construction activities included staging of process piping and installation of supports in the Aqueous Polishing Building (BAP); installation of process piping in the BAP; installation of ventilation system ductwork and supports in the BAP and MOX Processing Area (BMP); installation of drip trays in the BAP; installation of fire dampers in the BAP and BMP; and installation of various gloveboxes in the BAP and BMP. The applicant continued to receive, store, assemble, and test glove boxes and process equipment at the Process Assembly Facility (PAF).

### **2. Routine Resident Inspection Activities**

#### **a. Inspection Procedure (IP) 88130, Construction: Resident Inspection Program for On-Site Construction Activities at the Mixed Oxide Fuel Fabrication Facility**

##### **(1) Scope and Observations**

The inspectors reviewed the applicant's construction weekly status meeting notes. The inspectors 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 reviewed the status of work packages (WPs) maintained at various work sites. The inspectors reviewed various corrective action documents. The review included non-conformance reports (NCRs) and condition reports (CRs). The inspectors routinely performed tours of the MOX Fuel Fabrication Facility (MFFF) work areas to observe ongoing work activities and communications.

##### **(2) Conclusions**

No findings of significance were identified.

### **3. PSSC Inspections**

#### **a. PSSC-012, Emergency AC Power System**

##### **(1) Scope and Observations**

The inspectors observed construction activities related to PSSC-012, Emergency AC Power System, as described in Table 5.6-1 of the MFFF Construction Authorization Request (CAR). The inspection attribute observed was Procedures.

The inspectors witnessed emergency diesel generator (EDG) #1 being delivered, unloaded, and placed into storage at the Barnwell warehouse. In preparation for this activity, the inspectors reviewed CLRC#00180B Option A, Critical Lift Record dated



11/15/17 and associated corrective action documents. The inspectors noted that the EDG was placed in the warehouse, and that future actions were scheduled to do the final unpacking and maintenance to ensure the EDG was maintained per procedures and requirements.

(2) Conclusions

No findings of significance were identified.

**4. Programmatic Inspections**

a. Quality Assurance: Problem Identification, Resolution and Corrective Action (IP 88110)

(1) Scope and Observations

The inspection scope provided a review of the applicant's corrective action program to assess its adequacy and to determine whether it was effectively implemented.

Inspection activities included a review of procedures associated with problem identification, resolution, and corrective actions. In addition, program implementation was evaluated by sampling CRs, NCRs, engineering change requests (ECRs), field change requests (FCRs), and test deficiency reports (TDRs) that were initiated by the applicant to verify that there was proper documentation, prioritization, and resolution of problems identified. The review scope included assessments of the classifications of conditions, timeliness, and adequacy of corrective actions.

(a) Procedures

The inspectors reviewed implementing procedures for changes to guidance and instruction for the identification, evaluation, and correction of conditions adverse to quality. The review specifically examined changes made to the procedures since October 2016 to determine whether the procedures maintained by the applicant followed the MOX Project Quality Assurance Plan (MPQAP) requirements and applicable License Application commitments. The review scope included an evaluation of whether the following corrective action program performance attributes were addressed:

- complete and accurate identification of problems in a timely manner commensurate with their significance and ease of discovery;
- classification and prioritization of conditions adverse to quality;
- screening of items entered into the corrective action program as necessary to determine the proper level of evaluation;
- program considerations for extent of conditions, generic implications, common causes, and previous occurrences, as appropriate;
- for significant conditions adverse to quality, identification of root and contributing causes, as well as actions to preclude recurrence;
- identification and timely completion of corrective actions that were appropriately focused to correct the problems; and
- overview of trends in conditions adverse to quality and provisions for follow-up action and reporting to higher management where corrective action program implementation is indicated to be ineffective.

The inspection of procedures for the corrective action program, including the employee concerns program (ECP), confirmed the most current versions of the procedures followed the MPQAP requirements and applicable License Application commitments.

(b) Identification and Classification of Conditions Adverse to Quality

The inspectors evaluated the implementation of measures to promptly identify conditions adverse to quality such as failures, malfunctions, deficiencies, deviations, nonconformances, and significant conditions adverse to quality. A diverse sample of corrective action program records completed since October 2016 were reviewed to verify that conditions adverse to quality were appropriately classified according to their significance and corrective actions were defined accordingly. The review by the inspectors also determined whether issues entered into the corrective action program included findings and adverse conditions identified in audit reports, construction lessons learned, internal surveillance reports, corrective action trend reports, and management assessments. Direct observations of a management review committee meeting were conducted to verify responsible management, including senior management were informed and engaged in assuring the proper handling of corrective action program items.

The inspectors noted that problems and issues were being identified and corrected using a variety of processes such as CRs, NCRs, TDRs, ECRs, and FCRs.

(c) Documentation and Reporting of Conditions Adverse to Quality

The inspectors reviewed corrective action program records completed since October 2016, and interviewed responsible personnel to determine whether the following measures were implemented in accordance with procedures:

- determination of the extent of condition for conditions adverse to quality;
- designation of appropriate priority for conditions adverse to quality corrective actions and timely implementation of interim preventive measures in instances where extended periods may be necessary to accomplish remediation of problems;
- screening for potentially significant conditions to determine whether reviewers adequately considered risk, safety significance, consequence of malfunctions or failures, complexity of design and fabrication, needs for special controls or surveillance over activities;
- designation of appropriate investigation methods to ensure the proper determination of root, apparent, and/or contributing causes; and
- implementation of timely and effective corrective actions, including actions to prevent recurrence where required by procedure.

The inspectors reviewed a sample of records for completed NCRs to determine whether nonconformances were correctly and clearly identified, documented conditions were appropriately screened for non-hardware related conditions adverse to quality; dispositions were properly identified and documented; dispositions of use-as-is or repair were subjected to design control measures commensurate with those applied to the original design, and repaired or reworked items were re-examined in accordance with applicable procedures and with the original acceptance criteria.

Based on the inspection sample, in most cases the inspectors determined screenings for safety significance were properly conceived and performed in accordance with procedures. The inspectors determined that evaluations for extent of condition covered appropriate scope and were reasonably documented and causal evaluations met the requirements of the project procedures.

(d) Follow-up, Closure, and Trending

The inspectors reviewed documented results of corrective action effectiveness reviews, reports of corrective action program audits and surveillances, and records of program assessments to determine whether the effectiveness of program activities was determined and reported to the appropriate organizations and management. The scope of review included verifications that findings identified in previous NRC inspections had been entered into the corrective action program and had been remediated as required.

The inspectors reviewed a sample of recent trend reports to determine whether the reports were issued within the time frames established by procedures and corrective action program inputs were generated for adverse trends or recommendations as required by program procedures.

The inspectors also compared the results of the audits, self-assessments, and trending to the results of this inspection to determine if there were any discrepancies between the results of the inspection and the applicant's conclusions.

The inspectors determined that corrective actions addressed the identified issues and were completed within time frames authorized by responsible management. Assessments and trending of corrective action performance were being performed in accordance with management expectations and were consistent with observations from this inspection.

No significant adverse trends were currently identified by the applicant.

(e) Employee Concerns Program

The inspectors conducted reviews to provide insight into whether a safety conscious work environment (SCWE) existed at the MOX facility. The review also assessed the effectiveness of the employee concerns program, and evaluated management oversight of the corrective action process regarding handling and resolution of anonymous corrective action program entries.

The inspection scope included a review of internal SCWE results, external assessment from the Department of Energy (DOE), and interviews with a diverse sample of ten applicant and contracted employees including craft workers, crew leads, foremen, quality control inspectors, engineers, and MOX Services managers. The interviews were performed to determine whether there were factors at the construction project that would produce a "chilling" effect or reluctance to report issues.

Feedback obtained in the interviews consistently indicated management has not discouraged identification of problems or expression of concerns. Specifically, employees reported:

- that when issues were identified, management was responsive in addressing them;
- an awareness of and how to contact the ECP (e.g. Internal Website and Drop Boxes);
- they were comfortable raising safety concerns to either management or the ECP (however, for perspective, very few individuals indicated they had any direct interactions with the ECP); and
- frequent and positive management emphasis on maintaining workplace safety and raising safety concerns without reprisal was emphasized.

Most individuals did not directly associate the use of quality assurance program measures with SCWE, but instead with Occupational Safety and Health Administration (OSHA) issues. However, everyone was aware of the expectation to reliably implement quality program controls for items relied for safety.

Documents reviewed for the inspection of problem identification, resolution, and corrective action are listed in the Attachment.

(2) Conclusions

No findings of significance were identified.

b. 10 CFR, Part 21, Inspection-Facility Construction (IP 88111)

(1) Scope and Observations

The inspectors evaluated several 10 CFR Part 21 evaluations completed by the applicant against the quality assurance program to determine whether the applicant's procedures and program activities effectively implement the requirements of 10 CFR Part 21. The inspectors reviewed and inspected evaluations that either did not result in the identification of a defect, or failure to comply, and evaluations that did result in the identification of a defect, or failure to comply. These evaluations were reported to the NRC under 10 CFR Part 21, or the applicant chose not to notify the NRC and instead resolved with acceptable actions.

The 10 CFR Part 21 reports were related to the following items relied on for safety (IROFS) components and the associated principal systems, structures, and components (PSSCs):

- Pellet handling (PML) gloveboxes (PSSC-024) weld maps that were included with vendor documentation were not fully compliant with process equipment welding specification requirements for weld maps.
- PML gloveboxes (PSSC-024) electrical penetration holes out of tolerance due to weld distortions during vendor fabrication.
- Sintering furnace (PFE) (PSSC-048) cooling channel not in compliance with ASME Section VIII requirements for volumetric examination on full penetration welds.
- Modular frame assembly (PSSC-041) welds that were non-conforming to AWS D1.6 as required per procurement requirements.
- Cleanliness issues associated with the primary blend ball milling (NBX\*GB1000) and scrap ball milling (NBY\*GB1000) process unit glovebox frames (PSSC-024).

The inspectors reviewed documents to verify that the applicant effectively implemented the requirements of 10 CFR Part 21.21(a), regarding evaluating identified deviations by determining that:

- the procedures and controls to evaluate identified deviations had been established;
- the procedures and controls were effective in meeting these requirements; and
- the procedures and controls identified a specific director or responsible officer to notify of identified defects or failures to comply.

Specifically, the inspectors reviewed these procedures and controls against 10 CFR Part 21 evaluations that did not result in the identification of a defect, or failure to comply, to verify that:

- the items were identified for evaluation consistent with established procedures or by other means;
- the information and data used in the evaluations appeared to be factual and complete; and
- the findings of the evaluations that a substantial safety hazard or failure to comply did not exist was a logical conclusion of the evaluations.

The inspectors reviewed several 10 CFR Part 21 evaluation records in which the identified director or responsible officer was notified of a defect or failure to comply. The inspectors reviewed the records to verify that the applicant implemented the requirements of 10 CFR Part 21.21, regarding directors or responsible officers notifying NRC of identified defects, or failures to comply, related to significant safety hazards, by:

- determining if the controls and procedures accurately reflected the provisions of 10 CFR Part 21.21, regarding time frames for reporting identified defects or failures to comply;
- determining if the 10 CFR Part 21 report notifications to the NRC complied with the provisions of 10 CFR Part 21.21, regarding time frames for reporting identified defects or failures to comply; and
- determining if the 10 CFR Part 21 report notifications for which the applicant chose not to notify the NRC were adequately evaluated and had acceptable associated actions.

(2) Conclusions

No findings of significance were identified.

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

a. (Closed) Inspector Follow-up Item (IFI) 70-3098/2009-002-04: Follow-up Resolution of CR 20090163 on Technical Deficiencies of Procurement Specifications for Batteries

IFI 2009-002-04 was identified in inspection report 70-3098/2009-002. In the conclusion statement of section 5.b.4 it was stated that the licensee initiated CR 20090163, and that the inspectors would follow up on the resolution of the CR. IFI 2009-002-04 identified a concern that the calculated minimum final discharge battery terminal voltage of 105 VDC

would not supply sufficient voltage for IROFS DC breakers and relays. In section 3.b.2 of inspection report 70-3098/2010-002 it was stated that on April 1, 2010, inspectors found a new battery configuration was still under development. The calculation did not yet include a loading analysis for the pending change, and the report stated that the item would remain open. In the 2010-002 report CR 20090163 and an associated extent of condition document was listed as a document reviewed. On March 30, 2010 the applicant created another CR document 10888-MOX-CR-10-160 which discussed the battery final voltage values and the loading analysis.

The inspectors reviewed CR 10-160 to verify that the corrective actions addressed an end of life loading analysis. The inspectors reviewed calculations in the package to determine if end of life voltages were incorporated. The inspectors also reviewed a loading calculation which incorporated the data from procured IROFS breakers and relays and verified that the calculated voltage at the end of battery life was adequate to meet the minimum voltage requirements of the equipment.

Inspection activities related to the closure of this IFI were associated with PSSC-012, Emergency AC Power System. No findings of significance were identified during this inspection. IFI 70-3098/2009-002-004 is considered closed.

b. (Closed) Violation (VIO) 70-3098/2016-004-01: Repeated Failure to Adequately Install HSA Ductwork Bolting

The inspectors reviewed a document package which contained CRs, NCRs, and supporting documentation. Included in the package were NCR-17-7470 and CR-16-396. The inspectors specifically reviewed these two corrective action documents to verify that the actions taken met the letter written to the NRC in response to the NOV. The inspectors specifically reviewed documents which described the results of the 100% walk downs of HVAC flange bolts performed by the applicant. The inspectors also reviewed revisions to work package documents to include criteria for QC verification of HVAC duct installation. The inspectors reviewed documented training of superintendents, construction engineers, and general foremen on clarifying the requirements and the lessons learned training document included in the document package.

The inspectors inspected the bolts that had been identified in VIO 2016-004 to verify that they had been tightened. The inspectors observed the hanging of hold tags as described in the work package documents.

Inspection activities related to the closure of this VIO were associated with PSSC-050, Supply Air System (HAS). No findings of significance were identified during this inspection. Based on the review and inspection of the corrective actions taken, Violation (VIO) 70-3098/2016-004-01, Repeated Failure to Adequately Install HSA Ductwork Bolting is closed.

**6. Exit Meeting**

The inspection scope and results were summarized throughout this reporting period and by the Project Inspector at an exit meeting with applicant management on January 23, 2018. 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**

D. Del Vecchio, President and Chief Operating Officer  
D. Gwyn, Licensing/Nuclear Safety Manager  
D. Ivey, Director, Project Assurance  
F. Pinkston, ECP Manager  
E. Radford, Regulatory Compliance Manager  
J. Starling, Licensing  
D. Yates, Licensing Lead

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

IP 88110      Quality Assurance: Problem Identification, Resolution and  
                    Corrective Action (PIRCA) (Construction, Pre-Operation  
                    and Operation))  
IP 88111      10 CFR, Part 21, Inspection-Facility Construction  
IP 88130      Resident Inspection Program For On-Site Construction  
                    Activities at the Mixed-Oxide Fuel Fabrication Facility

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

<u>Item Number</u>	<u>Status</u>	<u>Description</u>
70-3098/2009-002-04	Closed	IFI: Follow-up Resolution of CR 20090163 on Technical Deficiencies of Procurement Specifications for Batteries (Section 5.a)
70-3098/2016-004-01	Closed	VIO: Repeated Failure to Adequately Install HSA Ductwork Bolting (Section 5.b)

### **4. LIST OF ACRONYMS USED**

ADAMS	Agency-Wide Document Access and Management System
BAP	Aqueous Polishing Building
BMP	MOX Processing Building
CB&I	Chicago Bridge and Iron
CAR	Construction Authorization Request
CFR	Code of Federal Regulations
CIB 2, 3, 4	Construction Inspection Branch 2, 3, 4
CR	Condition Report
DC	Direct Current
DCO	Division of Construction Oversight
DOE	Department of Energy
ECP	Employee Concerns Program
ECR	Engineering Change Request
EDG	Emergency Diesel Generator
FCR	Field Change Request
FCSE	Division of Fuel Cycle Safety and Environmental Review



FMB	Fuel Manufacturing Branch
HAS	Supply Air System
IFI	Inspector Follow-up Item
IP	Inspection Procedure
IR	Inspection Report
IROFS	Items Relied on for Safety
LA	License Application
MOX	Mixed Oxide
MOX Services	CB&I AREVA MOX Services
MFFF	MOX Fuel Fabrication Facility
MPQAP	MOX Project Quality Assurance Plan
NBX	Primary Blend Ball Milling
NBY	Scrap Ball Milling
NCR	Non-conformance Report
NMSS	Office of Nuclear Materials Safety and Safeguards
No.	Number
NRC	U.S. Nuclear Regulatory Commission
OSHA	Occupational Safety and Health Administration
PAF	Process Assembly Facility
PFE	Sintering Furnace
PML	Pellet Handling
PP	Project Procedure
PSSC	Principle System, Structure and Component
QA	Quality Assurance
QC	Quality Control
QL	Quality Level
RII	Region II
SCWE	Safety Conscious Work Environment
TDR	Test Deficiency Report
VIO	Violation
WP	Work Package

## 5. **LIST OF PSSCs REVIEWED**

- PSSC-012, Emergency AC Power System
- PSSC-024, Glovebox
- PSSC-041, Process Cells
- PSSC-048, Sintering Furnace (PFE/PFF)
- PSSC-050, Supply Air System (HAS)

## 6. **RECORDS AND DOCUMENTS REVIEWED**

### **Audits and Surveillances**

2017 SCWE Survey Results

2016 SCWE Survey Results

Contract No. DE-AC02-99CH10888; MOX Fuel Fabrication Facility Project; MOX Services Employee Concerns Program (ECP) Shadow Assessment, 6/26/2017

**Condition Reports**

10888-MOX-CR-16-101, Maintaining Laydown Yards, 10/9/16  
 10888-MOX-CR-16-151, Incomplete CRs Submitted for Record, 11/27/16  
 10888-MOX-CR-16-161, Error implementing a generic TDR, 10/16/16  
 10888-MOX-CR-16-166, Fire Detection Alarms, Design and Procurement Outside QA, 10/20/16  
 10888-MOX-CR-16-279, QC Inspector Record Deficiencies, 3/15/17  
 10888-MOX-CR-16-313, Incorrect Material Installed, 11/17/16  
 10888-MOX-CR-16-409, Improper Rigging Inspection of Chain Hoists in BMP B-222 and BMP B-327, 11/9/16  
 10888-MOX-CR-16-415, Welding Defects and Base Metal Damage on Mod Frames and Components supplied by Shaw SSS, 17 Nov 2016  
 10888-MOX-CR-16-430, BTS Records Storage Room did not meet the Relative Humidity and Temperature Requirements, 12/8/16  
 10888-MOX-CR-16-431, Purchase Order not flowing down requirements, 12/8/16  
 10888-MOX-CR-16-444, MC Work Package implementation deficiencies, 12/14/16  
 10888-MOX-CR-16-446, D-122 Coating Applied when not Required, 12/15/16  
 10888-MOX-CR-16-450, Bypassed Hold Point B-327, 12/19/16  
 10888-MOX-CR-16-456, Nonconforming Items Not Tagged, 12/28/16  
 10888-MOX-CR-17-008, Electrical Multicircuit Neutrals in the PAF, 1/12/17  
 10888-MOX-CR-17-009, PAG Multi-circuit Neutrals, 1/12/17  
 10888-MOX-CR-17-011, Chemical use codes recognition and application, 1/18/17  
 10888-MOX-CR-17-046, B 305 Fittings, 2/13/17  
 10888-MOX-CR-17-051, No QC sign off or review for QL-1LR tasks, 2/15/17  
 10888-MOX-CR-17-058, By-Passed Hold Point B188-PS-06196, 2/20/17  
 10888-MOX-CR-17-084, Storage Inspection Records, 3/1/2017  
 10888-MOX-CR-17-091, CS-02010 planned with incorrect Quality Level, 3/1/17  
 10888-MOX-CR-17-108, Inadequate fire extinguisher inspection on scissor lifts, 3/14/17  
 10888-MOX-CR-17-115, Missing Welder Qualification Records, 3/17/17  
 10888-MOX-CR-17-119, Edison 3" RGS Conduit Internal Diameter Input Error, 3/21/17  
 10888-MOX-CR-17-120, Loss of traceability, dated 3/21/17  
 10888-MOX-CR-17-128, Permitted Hot Work Activities are not being conducted per PP4-10, rev 4, 3/27/17  
 10888-MOX-CR-17-158, Cleanliness and Storage of Installed Drip Trays, 4/27/17  
 10888-MOX-CR-17-209, Monthly Controlled Storage Area Inspections, 5/30/2017  
 10888-MOX-CR-17-286, Failure to issue an NCR, 7/25/17  
 10888-MOX-CR-17-383, Installation of Process Equipment, 10/24/2017  
 10888-MOX-CR-17-384, HVAC Filter Housing Inadequate Cleanliness, 10/25/2017  
 10888-MOX-CR-17-385, Stainless Steel Duct Cleanliness Requirements, 10/24/2017  
 10888-MOX-CR-17-393, Inadequate Screening of Condition Report-Annual PI&R Inspection, 10/26/2017  
 10888-MOX-CR-17-395, NDP electrical weld studs and component installation procedural violation, 10/30/2017  
 10888-MOX-CR-17-424, Pre Lift Meeting Attendance, 11/15/2017

**Drawings**

19027, Glovebox Standard Details Electrical Penetration Installation Connector Hole Sizes And Spacing, Rev. 3

### **Engineering and Field Change Requests (ECRs and FCRs)**

ECR 029261, Resolution of MOX-NCR-16-7317, PFE/PFF Cooling Channel Welds, Rev. 0  
 ECR 029311, Electrolyzer Cadmium Panels As-Built Conditions, Rev. 0  
 ECR 029747, Verifications of subcritical dim 19113/19114, Rev. 0  
 ECR 028945, Revising FCN Requirements for Pipe and Fittings Substitutions, Rev. 0  
 ECR 028659, Valve Substitution, Rev. 0  
 ECR 000890, Revision of QL levels for the Homogenization, Sampling & Filling Unit Gloveboxes \*GB2000-3000-4000-7000 detail design package, Rev. 1  
 ECR 011074, Revise Damper locations in BAP Level 1 Area 12. Reconfigure Duct in C-105, C-143, Rev. 3  
 ECR 028857, Loss of Confinement event LOC-02a shaft failure revision, Rev. 0  
 ECR 029014, Room B-264a HSA Supply Duct to be Lowered Due to Field Adjustment With Overhead Concrete Ceiling, Rev. 0  
 ECR 029100, Downgrade Quality Level for Certain Airlock and Channel Weldments, Rev. 0  
 FCR 006344S, Non-standard conduit support in D112 shaft, Rev. 1  
 FCR 007081, Generic Conduit Support Anchor Modification thru FCN request, Rev. 0  
 FCR 007272, Installation tolerances needed for HVAC duct spools where dents are found in inspections, Rev. 0  
 FCR 006452S Wall Penetration B-304-W04-HNF is the same size as duct passing through it.  
 FCR 005295, Flange fabrication joint design, Rev. 0  
 FCR 006418, C-136 Piping interference with Ledger Plate, Rev. 0  
 FCR 006467, HSA duct in B-306 is not in the same location as the penetration, Rev. 0  
 FCR 006533, Contradiction between duct spec and penetration seal detail, Rev. 0  
 FCR 006707, B-115-PML GB3000 M13 Upper Brackets, Rev. 0

### **Nonconformance Reports (NCRs)**

10888-MOX-NCR-15-6173, NTM link module fire gap NTM\*GB2000J, 4/10/15  
 10888-MOX-NCR-15-6503, Fabricated SS GB is Out of Tolerance, 9/10/15  
 10888-MOX-NCR-16-7125, Penetration out of tolerance, 8/25/16  
 10888-MOX-NCR-16-7242, Bolt Connection found loose during NRC Inspection, 10/27/2017  
 10888-MOX-NCR-16-7274, Wrong Field Weld upsized, 11/15/16  
 10888-MOX-NCR-16-7299, Glovebox Face Flatness Measurements Were Not Performed, 11/9/2017  
 10888-MOX-NCR-16-7320, Inspection Documentation, 12/21/16  
 10888-MOX-NCR-17-7484, Unverified weld sizes on PFE/PFF GBs, 3/13/17  
 10888-MOX-NCR-17-7631, Vendor Weld, 5/23/17  
 10888-MOX-NCR-17-7880, Oil Leaks Observed on EDG 2, 9/27/2017

### **Miscellaneous**

CLRC#00180B Option A, Critical Lift Record, 11/15/17  
 Configuration Item Review Checklist, Rev. 1  
 DCS01-EEJ-DS-CAL-E-25314-0, DC Control Circuit Voltage Drop, Rev. 0  
 DCS01-KKJ-DS-SPE-M-15115, Field Fabrication and Instruction for Piping, Valves, and Specialty Items for QL-1 (Items Relied Upon for Safety), 7/8/2011

DCS01-PFE-DS-NTE-M-61546-0, Technical Note Regarding PFE/PFF\*FUR2000  
 Cooling Channel Design and NDE Requirements, 30 May 2017  
 DCS01 UFJ DS SPE T 16252, Piping Material Specifications, 8/29/2017  
 Declaration of Excess 290, 3/29/17  
 Declaration of Excess 350, 9/19/17  
 IFI 2009-002-004 Corrective Action Documents Package  
 LL-2016-024, Implement a Conservative Approach when Working with Multi-wire Branch  
 Circuits and other Neutral Hazards, 1/28/2016  
 PP11-36C, Critical Lift Record Card  
 Storage Inspection Record, Batch Plant Laydown Area, 10/23/17  
 Work Order Package 00011864 01, Storage Inspection Report, 6/2017

### **Project Procedures (PPs)**

PP 1-2, Preparation of Project Procedures, Rev. 14  
 PP 3-1, Employees Concern Program, Rev. 9  
 PP 3-5, Control of Nonconforming Items, Rev. 12  
 PP 3-6, Corrective Action Process, Rev. 17  
 PP 3-7, Internal Audits, Rev. 9  
 PP 3-11, Self-Assessments, Rev. 13  
 PP 3-25, Root Cause Analysis, Rev. 4  
 PP 3-26, Surveillances, Rev. 5  
 PP 3-28, Quality Control Receiving Inspections, Rev. 6  
 PP 3-30, Quality Control Inspection Plans & Inspection Reports, Rev. 5  
 PP 8-3, Evaluation and Reporting of Defects and Noncompliance (10 CFR Part 21), Rev.  
 7  
 PP 9-1, SSC Quality Level and Markings Design Documents, Rev. 17  
 PP 9-3, Design Control, Rev. 23  
 PP 9-21, Engineering Change Request, Rev. 14  
 PP 10-37, Control Of Issued Material, Rev. 4  
 PP 11-20, Field Change Requests, Rev. 6

### **Part 21 Evaluations**

PP 8-3 Form A, Log Number: 2015-24, 7 Jan 2016  
 PP 8-3 Form A, Log Number: 2016-29, 13 Oct 2016  
 PP 8-3 Form A, Log Number: 2016-29, 21 Nov 2016  
 PP 8-3 Form A, Log Number: 2016-30, 26 Oct 2016  
 PP 8-3 Form A, Log Number: 2016-32, 17 Nov 2016  
 PP 8-3 Form A, Log Number: 2016-32, 26 Apr 2017  
 PP 8-3 Form A, Log Number: 2016-40, 9 Feb 2017  
 PP 8-3 Form A, Log Number: 2016-40, 18 Sep 2017  
 PP 8-3 Form A, Log Number: 2016-41, 9 Feb 2017  
 PP 8-3 Form A, Log Number: 2016-41, 18 Sep 2017

### **Part 21 Evaluation Letters to NRC**

DCS-NRC-000413, "Docket Number 070-03098 CB&I AREV A MOX Services Mixed  
 Oxide Fuel Fabrication Facility Part 21 Report Notification", 7 Jan 2016

- DCS-NRC-000434, "Docket Number 070-03098 CB&I AREVA MOX Services Mixed Oxide Fuel Fabrication Facility Interim Report Notification: Vigor / Oregon Iron Works", 13 Oct 2016
- DCS-NRC-000435, "Docket Number 070-03098 CB&I AREVA MOX Services Mixed Oxide Fuel Fabrication Facility Interim Report Notification: Vigor / Oregon Iron Works", 27 Oct 2016
- DCS-NRC-000436, "Docket Number 070-03098 CB&I AREVA MOX Services Mixed Oxide Fuel Fabrication Facility Interim Report Notification: Shaw SSS Fabricators Modular Frame Assembly", 17 Nov 2016
- DCS-NRC-000437, "Docket Number 070-03098 CB&I AREVA MOX Services Mixed Oxide Fuel Fabrication Facility Closure of Interim Report Notification: Vigor / Oregon Iron Works", 22 Nov 2016
- DCS-NRC-000450, "Docket Number 070-03098 CB&I AREY A MOX Services Mixed Oxide Fuel Fabrication Facility Interim Report Notification: ALD-France", 9 Feb 2017
- DCS-NRC-000454, "Docket Number 070-03098 CB&I AREVA MOX Services Mixed Oxide Fuel Fabrication Facility Part 21 Final Report: Shaw SSS Fabricators Modular Frame Assemblies", 26 Apr 2017
- DCS-NRC-000457, "Docket Number 070-03098 CB&I AREVA MOX Services Mixed Oxide Fuel Fabrication Facility Closure of Interim Report Notification: Vigor / Oregon Iron Works", 12 Jun 2017
- DCS-NRC-000464, "Docket Number 070-03098 CB&I AREY A MOX Services Mixed Oxide Fuel Fabrication Facility Closure of Interim Report Notification: ALD-France", 19 Sep 2017