



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

July 23, 2015

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 70-3098/2015-002

Dear Mr. Del Vecchio:

During the period from April 1 through June 30, 2015, 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 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/

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 70-3098/2015-002
w/attachment: Supplemental Information

cc: (See page 3)

cc:

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

Dr. Peter Winokur, Chairman
Defense Nuclear Facilities Safety Board
625 Indiana Ave., NW, Suite 700
Washington, DC 20004

Mr. Joseph Olencz, NNSA/HQ
1000 Independence Ave., SW
Washington, DC 20585

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

D. Silverman
Morgan, Lewis, and Bockius
1111 Penn. Ave., NW
Washington, DC 20004

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

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

L. 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

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

Sincerely,

/RA/

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Distribution:

R. Johnson, NMSS
D. Tiktinsky, NMSS
K. Morrissey, NMSS
W. Jones, RII
J. Yerokun, RII
D. Seymour, RII
D. Ayres, RII
J. Heisserer, RII
R. Musser, RII
W. Gloersen, RII
C. Huffman, RII
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NAME	W. Gloersen	C. Huffman	D. Piccirillo	D. Harmon			
DATE	7/22/15	7/22/15	7/22/15	7/22/15			
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U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.: 70-3098

Construction
Authorization No.: CAMOX-001

Report No.: 70-3098/2015-002

Applicant: CB&I AREVA MOX Services

Location: Savannah River Site
Aiken, South Carolina

Inspection Dates: April 1 – June 30, 2015

Inspectors: C. Huffman, Senior Resident Inspector, Construction Projects
Branch 1 (CPB1), Division of Construction Projects (DCP), Region II
(RII)
D. Harmon, Construction Inspector, Construction Inspection Branch 3
(CIB3), Division of Construction Inspection (DCI), RII
D. Piccirillo, Senior Construction Project Inspector, Construction Projects
Branch 2 (CPB2), DCP, RII

Accompanying
Personnel: D. Tiktinsky, Senior Project Manager, Fuel Manufacturing Branch (FMB),
Division of Fuel Cycle Safety and Safeguards (FCSS), Office of
Nuclear Materials Safety and Safeguards (NMSS)
K. Morrissey, Project Manager, FMB, FCSS, NMSS
W. Gloersen, Senior Construction Project Inspector, CPB1, DCP, RII

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

Enclosure

EXECUTIVE SUMMARY

CB&I AREVA MOX Services (MOX Services)
Mixed Oxide (MOX) Fuel Fabrication Facility (MFFF)
NRC Inspection Report Number 70-3098/2015-002

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, fabrication, procedure controls, and special processes (welding activities).

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

- PSSC-003, Backflow Prevention Features
- PSSC-004, C2 Confinement System Passive Barrier
- PSSC-009, Criticality Control
- PSSC-010, Double-walled Pipe
- PSSC-021, Fire Barriers
- PSSC-023, Fluid Transport Systems
- PSSC-024, Gloveboxes
- PSSC-036, MOX Fuel Fabrication Building
- PSSC-041, Process Cells
- PSSC-045, Process Safety Control Subsystem

Routine Resident Inspections

The inspectors 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 (CAP). Construction activities were performed in a safe and quality-related manner. No findings of significance were identified (Section 2).

PSSC Inspections

PSSC-036, MOX Fuel Fabrication Building

The inspectors observed construction activities related to PSSC-036, MOX Fuel Fabrication Building, as described in Table 5.6-1 of the MFFF CAR. The inspection attributes observed were special processes (welding) and installation. The inspectors observed completed welding and installation of supporting structures in the Aqueous Polishing Building (BAP). Observations included the completed welding and installation of ledger assemblies that support pre-cast floor panels in the BAP. An unresolved item (URI) associated with potentially inadequate welds on the pre-cast floor panel ledgers in the BAP was identified (Section 3.a).

PSSC-003, Backflow Prevention Features; PSSC-010, Double-Walled Pipe; PSSC-023, Fluid Transport Systems; PSSC-041, Process Cells; PSSC-045, Process Safety Control Subsystem

The inspectors observed construction activities related to PSSC-004, C2 Confinement System Passive Barrier; PSSC-010, Double-Walled Pipe; PSSC-023, Fluid Transport Systems; PSSC-041, Process Cells; and PSSC-045, Process Safety Control Subsystem as described in Table 5.6-1 of the MFFF CAR. The inspection attributes observed were special processes, fabrication, procedures, and installation. The items relied on for safety (IROFS) components associated with these PSSCs were QL-1 piping and the framework supporting the piping that was being installed in the active gallery. 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 following glovebox systems:

- Jar Storage and Handling Unit (NTM)
- Pre-Polishing Milling (KDM)

Observations included alignment of the glovebox shells, component installation, internal cleanliness, distortion control and welding of the glovebox units. No findings of significance were identified (Section 3.c).

PSSC-021, Fire Barriers

The inspectors observed construction activities related to PSSC-021, Fire Barriers, as described in Table 5.6-1 of the MFFF CAR. The inspection attributes observed were procedures and installation. The associated systems, structures and components were fire dampers located in the MOX Process Building (BMP). No findings of significance were identified (Section 3.d).

PSSC-004, C2 Confinement System Passive Barrier

The inspectors observed construction activities related to PSSC-004, C2 Confinement System Passive Barrier, as described in Table 5.6-1 of the MFFF CAR. The inspection attributes observed were special processes and fabrication. The IROFS component associated with this PSSC was QL-1 ducting. No findings of significance were identified (Section 3.e).

PSSC-009, Criticality Control

The inspectors observed construction activities related to PSSC-009, Criticality Controls, as described in Table 5.6-1 of the MFFF CAR. The inspection attributes observed were procedure controls and installation. The associated IROFS components were annular and slab type tanks associated with the oxalic mother liquor recovery unit located in the first level of the BAP. The inspectors concluded that tank installation and quality control inspection activities relating to criticality control were acceptable. No findings of significance were identified (Section 3.f).

Programmatic Inspections**Quality Assurance: Control of Materials, Equipment, and Services (Inspection Procedure (IP) 88130)**

Requirements for handling storage and shipping, as specified in the MPQAP, were met by the applicant in accordance with project procedures. Project procedures provided adequate measures to ensure that applicable requirements of NQA-1, Quality Assurance Requirements for Nuclear Facilities Applications (NQA-1 1994), including, but not limited to, storage area designation, access control, special protective environments, temperature levels and periodic surveillances, were adequate to prevent damage or deterioration to QL-1 materials. The inspectors had reasonable assurance that the storage of material was adequate to assure that the applicant's commitments related to the regulatory requirements of the MPQAP were met. No findings of significance were identified (Section 4).

Attachment:

Supplemental Information

REPORT DETAILS

1. Summary of Facility Status

During the period, the applicant (CB&I AREVA MOX Services (MOX Services)) continued construction activities of principle systems, structures and components (PSSCs). Construction activities included staging, welding, and mounting of process piping and installation of supports in the Aqueous Polishing Building (BAP) and Manufacturing Building (BMP); installation of ventilation system ductwork and supports in the BAP and BMP; installation of fire dampers; foundation excavation for the Diesel Generator Building (BEG); and installation of various gloveboxes in the BMP. The applicant continued to 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)

a. Scope and Observations

The inspectors routinely held discussions with MOX Services design engineers, field engineers, regulatory compliance personnel, 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.

In addition, the inspectors conducted tours of material storage areas and the PAF to determine if MOX Services properly stored equipment and materials in accordance with MOX Project Quality Assurance Plan (MPQAP) storage requirements. Specifically, the inspectors verified that MOX Services implemented 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) and condition reports (CRs). The inspectors also reviewed the closure of selected NCRs and CRs.

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

The inspectors performed 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.

In addition, the inspectors performed a walk down of the welding filler metal storage and issue room to determine if filler metal was stored and issued in accordance with the filler metal control procedure and code requirements. Specifically, the inspectors verified the following:

- The room was weatherproof, clean, dry, and securable
- The room was secured (i.e. locked) when unoccupied by the attendants
- Stored materials were identifiable
- Materials were stored neatly and off the floor
- Coated welding electrodes whose container had been opened were stored in an oven
- Ovens were maintained above the minimum temperature
- Ovens were checked daily with calibrated measuring and test equipment (M&TE) and recorded in a log book
- Ovens only contained one classification of weld filler metal
- Oven doors were labeled with their contents
- Ovens were wired to a dedicated power source shared with an analogue clock to determine if power was lost
- Ovens contained only filler metal

b. Conclusion

The inspectors 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 (CAP). Construction activities were performed in a safe and quality-related manner. No findings of significance were identified.

3. **Principle Systems, Structures and Components (PSSC) Related Inspections**

a. **PSSC-036, MOX Fuel Fabrication Building**

(1) Attributes: Fabrication, Procedure Controls and Installation (IP 55050, Nuclear Welding)

(a) Scope and Observations

The inspectors observed construction activities related to PSSC-036, MOX Fuel Fabrication Building, as described in Table 5.6-1 of the Mixed Oxide (MOX) Fuel Fabrication Facility (MFFF) Construction Authorization Request (CAR). The inspection attributes observed were special processes (welding) and installation. The inspectors observed completed welding and installation of supporting structures in the BAP.

Observations included the completed welding and installation of ledger assemblies that support pre-cast floor panels in the BAP. An unresolved item (URI) (URI 70-3098/2015-002-001) was identified relating to potentially inadequate welds on approximately 100 ledger assemblies which support the floor or ceiling of 25 rooms.

(b) Conclusion

The inspectors observed construction activities related to PSSC-036, MOX Fuel Fabrication Building, as described in Table 5.6-1 of the MFFF CAR. The inspection attributes observed were special processes (welding) and installation. The inspectors observed completed welding and installation of supporting structures in the BAP. Observations included the completed welding and installation of ledger assemblies that support pre-cast floor panels in the BAP. An unresolved item (URI: 70-3098/2015-002-001) was identified relating to potentially inadequate welds on approximately 100 ledger assemblies which support the floor or ceiling of 25 rooms the BAP was identified.

b. PSSC-003, Backflow Prevention Features; PSSC-010, Double-Walled Pipe; PSSC-023, Fluid Transport Systems; PSSC-041, Process Cells; PSSC-045, Process Safety Control Subsystem(1) Attributes: Procedure Controls, Fabrication, Installation, and Special Processes (IP 55050, Nuclear Welding)(a) Scope and Observations

The inspectors observed construction activities related to PSSC-003, Backflow Prevention Features; PSSC-010, Double-Walled Pipe; PSSC-023, Fluid Transport Systems; PSSC-041, Process Cells; and PSSC-045, Process Safety Control Subsystem as described in Table 5.6-1 of the MFFF CAR. The inspection attributes observed were special processes, fabrication, procedure controls, and installation. The items relied on for safety (IROFS) components associated with these PSSCs were quality level (QL) -1 piping and the framework structures supporting the piping that was being installed in the active gallery.

The inspectors observed manual welding of pipe support 60653 on frame 40300 in the secure warehouse and orbital welding of weld KPB-0047701-05-FW005-C0R0 in the active gallery to determine if welding was performed in accordance with the applicable American Welding Society (AWS) or American Society for Mechanical Engineers (ASME) code. Specifically the inspectors noted the following:

- Welding variables such as amperage, shielding gas composition and flow rate, and polarity were within the limits of the welding procedure
- Welding filler metal was the correct size and classification as required by the welding procedure
- Vertical welding was performed with upwards progression
- Welding filler metal was issued and handled by the welder in accordance with the weld filler metal control procedure
- QC had signed off on the weld data sheet for fit-up before final welding began
- The weld area was adequately clean of deleterious substances such as rust, grease, and oils, and that welding was protected from wind, rain, or other adverse weather conditions
- The welding procedure was available to the welders at the work location
- Interpass temperatures were maintained below the maximum allowed by the welding procedure

- Catalysts used in orbital welding were as specified on the welding procedure

In addition, the inspectors reviewed the following:

- Welders' qualification testing records to determine if they had been qualified in accordance with the AWS code to make the welds
- Welding procedure D1.6-GT-A-B-01 Rev. 3, to determine if it met the requirements of AWS D1.6, Structural Welding Code - Stainless

The inspectors performed a visual inspection and record review of completed pipe support 32084 in the active gallery. The inspectors visually examined the three field welds to determine if they were of sufficient quality and met the size and location requirements of the engineering drawings. The inspectors checked to see if the support was made with the correct size and shape pieces which were in the positions and alignments required by the associated drawings. The inspectors also reviewed the associated welding procedures, welder qualification records, and weld data sheets to determine if it was made and inspected by qualified individuals using qualified procedures.

During the inspection period, the applicant continued welding and mounting piping in BAP room C-234 (active gallery) and secure warehouse. The inspectors observed piping and structural welds on support rack module 13N as they were assembled in the secure warehouse. The inspectors observed structural welds for the pipe rack modules completed by the vendor and MOX facility to determine whether they were made and installed in accordance with the applicable drawings and AWS code, D1.6, Structural Welding Code – Stainless Steel, 1999 edition (AWS D1.6). The inspectors concluded that structural steel installation and piping installation (welding) were in compliance with applicable codes and procedures.

(b) Conclusion

The inspectors observed construction activities related to PSSC-003, Backflow Prevention Features; PSSC-010, Double-Walled Pipe; PSSC-023, Fluid Transport Systems; PSSC-041, Process Cells; and PSSC-045, Process Safety Control Subsystem as described in Table 5.6-1 of the MFFF CAR. The inspection attributes observed were special processes, fabrication, procedures, and installation. The IROFS components associated with these PSSCs were QL-1 piping and the framework supporting the piping that was being installed in the active gallery. No findings of significance were identified.

c. PSSC-024, Gloveboxes

- (1) Attributes: Procedure Controls, Special Processes (Welding), and Installation (IP 88130, Construction: Resident Inspection Program for On-Site Construction Activities at the Mixed Oxide Fuel Fabrication Facility; and IP 55050, Nuclear Welding)

(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 ongoing installation and procedure control activities associated with the following glovebox systems:

- Jar Storage and Handling Unit (NTM)
- Pre-Polishing Milling (KDM)

Observations included alignment of the glovebox shells, component installation, internal cleanliness, distortion control and welding of the glovebox units.

The inspectors observed in process welding of weld number PSE-MG-PLE-M-01100-FW103-C0R0 joining Green Pellet Storage (PSE) gloveboxes PSE*G1000 and PSE*G2000. The inspectors reviewed the associated weld data sheet, material issue ticket and weld technique sheet to determine whether work was accomplished according to applicable procedures and specifications.

The inspectors reviewed rework and repair activities associated with the installation of NTM glovebox components. The inspectors observed distortion control activities, grinding and permanent construction aid installation necessary to achieve proper clearance for rotating fire doors on NTM link gloveboxes.

The inspectors performed visual observations and measurements on purification cycle (KPA) and solvent recovery (KPB) glovebox shells to determine whether weld sizes were structurally adequate and seal welds were complete. The inspectors reviewed shop inspection reports for gloveboxes KPA*GB4000 and KPB*GB1000 to determine whether shop inspectors had completed the required inspections for welding activities at the vendor.

The inspectors observed positioning and welding activities associated with the installation of grinding gloveboxes. Specifically, the inspectors observed in process welding of the attachment of gloveboxes to an embed plate in the ceiling of the BMP structure (weld doc number 1402468).

The inspectors also observed continued installation, alignment, housekeeping, and passivation layer restoration activities associated with the NTM Unit and associated link and scale glovebox modules to determine whether work was performed in accordance with work package instructions and drawings.

The inspectors observed the performance of penetrant testing on potential linear indications on elements of NTM link module embed plates to determine whether those activities were performed in accordance with liquid penetrant procedures. The inspectors also performed a review of the penetrant inspection results and verified that identified indications were appropriately dispositioned.

In addition, the inspectors observed manual shielded metal arc welding of welds KDM-MC-PLI-M-60112-01 FW-005 and 006 to determine if welding was performed in accordance with the AWS D1.1 Structural Welding – Steel code and the applicable site procedures. Specifically, the inspectors noted the following:

- Welding variables such as amperage and polarity were within the limits of the welding procedure,
- Welding electrodes were the correct size and classification as required by the welding procedure

- Welding electrodes were issued and handled by the welder in accordance with the weld filler metal control procedure
- Welding electrodes were traceable to a unique heat number that was traceable to a certified material test report (CMTR)
- The weld area was adequately clean of deleterious substances such as rust, grease, and oils, and that welding was protected from wind, rain, or other bad weather conditions

The inspectors also reviewed the following:

- Welding procedure to determine if it was written and qualified in accordance with the requirements of the AWS code
- The welder's qualification testing records to determine if he was qualified in accordance with the AWS code to make the welds
- The CMTR associated with the welding filler metal to determine if it met the physical and chemical requirements of the AWS code

(b) Conclusion

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 IROFS components associated with PSSC-024 were gloveboxes. The inspectors observed ongoing installation and procedure control activities associated with the following glovebox systems:

- Jar Storage and Handling Unit (NTM)
- Pre-Polishing Milling (KDM)

Observations included alignment of the glovebox shells, component installation, internal cleanliness, distortion control and welding of the glovebox units. No findings of significance were identified.

d. **PSSC-021, Fire Barriers**

(1) Attributes: Procedures and Installation (IP 88130, Construction: Resident Inspection Program for On-Site Construction Activities at the Mixed Oxide Fuel Fabrication Facility)

(a) Scope and Observations

The inspectors observed the ongoing activities related to installation of fire dampers in the BMP. The inspectors observed construction activities related to PSSC-021, Fire Barriers, as described in Table 5.6-1 of the MFFF CAR. The inspection attributes observed were procedures and installation. The associated IROFS components were fire dampers located in the BMP.

Specifically, the inspectors observed the following fire dampers and Structo-Crete for wall penetrations: HSA*DMPF0135B, MDE*DMPF0135B, HSA*DMPF0140B, and HSA*DMPF0187B

The inspectors verified that the installed fire dampers met the requirements of DCS01-BMF-DS-PLF-A-04509, Rev. 3, MOX Fuel Fabrication Facility ABC Construction of Typical Fire Damper Penetration Details. Specifically, the inspectors verified that Structo-Crete material was installed in accordance with annular space requirements and that the fit-up of damper flanges to walls was sufficient to allow for the future installation of flange sealer material.

(b) Conclusion

The inspectors observed construction activities related to PSSC-021, Fire Barriers, as described in Table 5.6-1 of the MFFF CAR. The inspection attributes observed were procedures and installation. The associated IROFS components were fire dampers located in the BMP. No findings of significance were identified.

e. **PSSC-004, C2 Confinement System Passive Barrier**

(1) Attributes: Special Processes and Fabrication (IP 55050, Nuclear Welding)

(a) Scope and Observations

The inspectors observed construction activities related to PSSC-004, C2 Confinement System Passive Barrier, as described in Table 5.6-1 of the MFFF CAR. The inspection attributes observed were special processes (welding) and fabrication. The associated IROFS component associated with this PSSC was QL-1 heating, ventilation, and air conditioning (HVAC) ducting.

The inspectors observed manual welding of weld 15-B384-MDE-3065-FW001 to determine if welding was performed in accordance with applicable code and site procedures. Specifically, the inspectors noted the following:

- Welding variables such as amperage, shielding gas composition and flow rate, and polarity were within the limits of the welding procedure
- Welding filler metal was the correct size and classification as required by the welding procedure
- Vertical welding was done with upwards progression
- Welding filler metal were issued and handled by the welder in accordance with the weld filler metal control procedure
- QC had signed off on the weld data sheet for fit-up before final welding began
- The weld area was adequately clean of deleterious substances such as rust, grease, and oils, and that welding was protected from wind, rain, or other adverse weather conditions

In addition, the inspectors reviewed the welder's qualification testing records to determine if the welder was qualified in accordance with the AWS code to make the welds.

(b) Conclusion

The inspectors observed construction activities related to PSSC-004, C2 Confinement System Passive Barrier, as described in Table 5.6-1 of the MFFF CAR. The inspection

attributes observed were special processes and fabrication. The IROFS component associated with this PSSC was QL-1 HVAC ducting. No findings of significance were identified.

f. PSSC-009, Criticality Control

(1) Attributes: Procedure Controls and Installation (IP 88107 Quality Assurance: Design and Document Control)

(a) Scope and Observations

The inspectors observed construction activities related to PSSC-009, Criticality Controls, as described in Table 5.6-1 of the MFFF CAR. The inspectors reviewed inspection documentation and performed direct measurements to determine whether subcritical dimensions were achieved for areas in the BAP. The attributes observed were procedure controls and installation. The associated IROFS components were annular and slab type tanks located in the first level of the BAP.

The inspectors performed a walk down of room C-134 of the oxalic mother liquor (KCD) recovery unit on the first level of the BAP to determine whether tanks were installed in a manner consistent with the subcritical dimension requirements for the area. Inspectors performed measurements of the distances between tanks and distances to adjacent walls to determine whether these distances were greater than or equal to the required minimum. These subcritical dimensions were documented on the subcritical verification report inspection documentation. The inspectors reviewed this documentation and compared it to the inspector performed measurements to determine whether QC inspection activities were adequate.

(b) Conclusion

The inspectors observed construction activities related to PSSC-009, Criticality Controls, as described in Table 5.6-1 of the MFFF CAR. The inspection attributes observed were procedure controls and installation. The associated IROFS components were annular and slab type tanks associated with the KCD recovery units located in the first level of the BAP. The inspectors concluded that tank installation and QC inspection activities relating to criticality control were acceptable. No findings of significance were identified.

4. Programmatic Inspections

a. Quality Assurance: Control of Materials, Equipment, And Services (IP 88130)

(1) Scope and Observations

The inspectors observed the storage of QL-1 material to determine whether the handling, storage, cleaning, packaging, shipping, and preservation of items were controlled in accordance with requirements of the MPQAP and site procedures to prevent damage or loss and to minimize deterioration.

The inspectors performed walk-downs of storage areas in the following locations: BMP, BAP, Northeast Laydown Yard, and PAF.

The inspectors observed the storage and tagging of nonconforming items stored in the field to determine whether they met the tagging and segregation requirements of site procedure PP3-5, Control of Nonconforming Items, Rev. 10.

The inspectors observed the condition of packaging and indications on monitoring equipment on items received at the site to determine if QL-1 materials were subject to potential damage from inadequate handling or adverse environmental controls/impacts during shipping.

The inspectors observed the use of desiccant and atmospheric monitoring equipment on gloveboxes to ensure equipment installed in the gloveboxes did not deteriorate due to atmospheric conditions or construction activities. The inspectors observed access control and environmental monitoring for Levels B storage areas.

(2) Conclusion

Requirements for handling storage and shipping, as specified in the MPQAP, were met by the applicant in accordance with project procedures. Project procedures provided adequate measures to ensure that applicable requirements of NQA-1, Quality Assurance Requirements for Nuclear Facilities Applications (NQA-1 1994) including, but not limited to, storage area designation, access control, special protective environments, temperature levels and periodic surveillances were adequate to prevent damage or deterioration to QL-1 materials. The inspectors had reasonable assurance that the storage of material was adequate to assure that the applicant's commitments related to the regulatory requirements of the MPQAP were met. No findings of significance were identified.

5. Exit Interview

The inspection scope and results were summarized throughout this reporting period and on July 15, 2015. 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

D. Del Vecchio, President and Chief Operating Officer
M. Gober, VP Engineering
D. Gwyn, Licensing/Nuclear Safety Manager
D. Ivey, VP Project Assurance
A. Johnston, Quality Control Supervisor
E. Radford, Regulatory Compliance Manager
K. Trosen, Lead Welding and Materials Engineer
S. King, VP Project Assurance (Acting)

2. INSPECTION PROCEDURES (IPs) USED

IP 88107	Quality Assurance: Design and Document Control
IP 88130	Resident Inspection Program For On-Site Construction Activities at the Mixed-Oxide Fuel Fabrication Facility
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 70-3098/2015-002-001	Open	Potentially Inadequate Welds on the Pre-cast Floor Panel Ledgers in the BAP (Section 3.a)

4. LIST OF PSSCs REVIEWED

PSSC-003	Backflow Prevention Features
PSSC-004	C2 Confinement System Passive Barrier
PSSC-009	Criticality Control
PSSC-010	Double-walled Pipe
PSSC-021	Fire Barriers
PSSC-023	Fluid Transport Systems
PSSC-024	Gloveboxes
PSSC-036	MOX Fuel Fabrication Building
PSSC-041	Process Cells
PSSC-045	Process Safety Control Subsystem

5. LIST OF ACRONYMS USED

ADAMS	Agency-Wide Document Access and Management System
ASME	American Society of Mechanical Engineers
AWS	American Welding Society
BAP	Aqueous Polishing Building
BEG	Diesel Generator Building
BMP	MOX Processing Building
CAP	Corrective Action Program

CAR	Construction Authorization Request
CB&I	Chicago Bridge and Iron
CFR	Code of Federal Regulations
CIB3	Construction Inspection Branch 3
CMTR	Certified Materials Test Report
CPB1, 2	Construction Projects Branch 1, 2
CR	Condition Report
DCP	Division of Construction Projects
DCI	Division of Construction Inspection
FCSS	Fuel Cycle Safety and Safeguards
FMB	Fuel Manufacturing Branch
GB	Glovebox
HDE	High Depressurization Exhaust
HVAC	Heating, Ventilation, and Air Conditioning
IP(s)	Inspection Procedure(s)
IROFS	Items Relied on for Safety
KCD	Oxalic Mother Liquor Recovery Unit
KDM	Pre-polishing Milling
KPA	Purification Cycle
KPB	Solvent Recovery
KWG	Off-gas Treatment Unit
LA	License Application
MDE	Medium Depressurization Exhaust
MFFF	MOX Fuel Fabrication Facility
MOX	Mixed Oxide
MOX Services	CB&I AREVA MOX Services
MPQAP	MOX Project Quality Assurance Plan
M&TE	Measuring and Test Equipment
NQA-1 1994	Quality Assurance Requirements for Nuclear Facilities Applications 1994 Edition
NCR	Non-Conformance Report
NDE	Non-destructive Examination
NMSS	Nuclear Materials Safety and Safeguards
NRC	Nuclear Regulatory Commission
NTM	Jar Storage and Handling Unit
PAF	Process Assembly Facility
PP	Project Procedure
PRE	Grinding
PSE	Green Pellet Storage
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
TCO	Temporary Construction Opening
URI	Unresolved Item
WP(s)	Work Package(s)

6. **RECORDS AND DOCUMENTS REVIEWED**

Condition Reports

CR 10888-MOX-CR-15-225

Drawings

Newport News Industrial Drawings, Aqueous Polishing Area Off-Gas Treatment NOX Scrubbing Column KWG 1000 Support Structure B1 and B2, Sheets S001-S003

Newport News Industrial Drawings, NOX Scrubbing Column KWG CLMN 1000 Assembly and Details, MC1000

DCS01-NTM-MG-PLE-M-94102, Sheet 1, BMP – Level 01 – Room B123 Jar Storage and Handling Unit Link Module Assembly, Rev. 1

DCS01-NTM-MG-PLE-M-94107, Sheet 1, BMP – Level 01 – Powder Area Jar Storage and Handling Unit Embed Plate Assembly, Rev. 0

DCS01-NTM-MG-PLI-M-96115, Sheet 1, BMP – Level 01 – Powder Area Jar Storage and Handling Unit Criticality Layout

Nonconformance Reports

NCR 10888-MOX-NCR-15-6339

Project Procedures

PP 3-32, Visual Welding Inspection Criteria, Rev. 0

PP 9-21, Engineering Change Request, Rev. 11

PP9-39, Verification of Subcritical Dimensions for Criticality Safety, Rev. 3, dated June 2, 2014

PP 10-37, Control of Issued Material, Rev. 2

PP 10-38, Storage and Control of Material, Rev. 1

PP 10-39, Issue and Return of Material, Rev. 1

PP 11-33, Housekeeping and Work Area Cleanness, Rev. 0

PP 11-40, Preventative Maintenance of In-Storage/Installed Equipment During the Construction Phase, Rev. 3

PP 11-51, AWS D1.1 and D1.6 General Welding Procedure, Rev. 2

PP 11-58, Weld Filler Material Control, Rev. 4

Specifications

DCS01-ZMJ-DS-SPE-M-19113-6, Glovebox Shell Fabrication, Inspection and Test Requirements

DCS01-ZMS-DS-SPE-M-15145-5, Field Fabrication and Installation of Pipe and Electrical Raceway Supports

WTS B31.3-GTAC-8-8-01, Rev. 4

WTS D1.6-GT-A-B-01, Rev. 3

WTS D1.1-SM-I-II-01, Rev. 1

Work Orders/Packages

14-CP24-NTM-PE-M-1357, Installation of NTM*GB2000G Link Module
 13-CP24-B117-PSE*G1000/2000-M002, PSE Glovebox Seam Welds
 11-CP27-C234-KCD-P-M-0002-01C, KCD Installation
 14-CP27-C234-P-M-0004-14N, Pipe Positioning and Installation in BAP
 Module 14N C234
 14-B140-PRE-GB-M-1450, PRE Installation
 WP# 09-10888-C1935-AP-KCD-TK1500-M
 WP# 10-CP27-KCD-TK1000-2000-M
 WP# 10-CP27-KCD-TK4000-4200-M

Other Documents

WTS B31.3-GTAC-8-8-01, Rev. 4
 URS Employee 98676 Current NDE Certifications and Visual Acuity
 Examination Records
 PT-MOX-1507, Liquid Penetrant Report (Visible Dye – Solvent Removable)
 DCS01-ZMJ-DS-SPE-M-19113-6, Glovebox Shell Fabrication, Inspection and
 Test Requirements
 DCS01-ZMS-DS-SPE-M-15145-5, Field Fabrication and Installation of Pipe
 and Electrical Raceway Supports
 DCS01-ZMJ-DS-SPE-M-19107-7, Process Equipment Welding Requirements
 DCS01-KPA-MG-PLD-M-51204, Purification Cycle Unit KPA GB4000 Shell
 and Mixs Supports Welded Glovebox Shell Details, Rev. 1
 QC-RIR-13-46068, Helium Leak Test Report for KPB-TK-2100
 Weld Doc 1308999, Pipe Support Detail KPA, Sheet 1, Rev. 0
 DCS01-ZMS-DS-PLD-M-C234-PS-92062, Pipe Support Detail, Rev. 0
 QC-RIR-13-47468, ACPP fabrication of KPA Glovebox
 ACPP-12-SIR188, Shop Inspection Report, Glovebox KDD 1000
 ACPP-11-SIR322, Shop Inspection Report Glovebox KPA 4000
 ACPP-11-SIR227, Shop Inspection Report Glovebox KDD 1000 First Weld
 Concrete Placement Pre-Pour Checklist, BAP C234 El. 0' TCO AP 2-4
 Weld Record 1307872 for Weld Number NTM-MG-PLI-M-96115-FW020-
 C0R0
 Weld Record 1306931 for Weld Number PSE-MG-PLI-M-01100-FW103-
 C0R0
 Welding Technique Sheets: D1.6-GT-A-B-01 Rev. 3, D1.1-SM-I-II-01 Rev. 1, B31.3-GT-8-8-
 01 Rev. 3, B31.3-GTAC-8-8-01 Rev. 5
 Weld data sheets for PS 32084 FW 1, 2, & 3
 Welder qualification records: P119, P190, P126, S103, I078
 CMTR for ESAB E7018 heat 58666C
 DCS01-KCD-CG-CAC-H-08013-0, Criticality Safety of the Tanks in Cell C-134 of Unit KCD,
 dated April 26, 2011
 DCS01-KCD-DS-ANS-H-35007-5, Nuclear Criticality Safety Evaluation (NCSE) of the Oxalic
 Mother Liquor Recovery Unit (KCD), dated April 2, 2015
 SDEF-KCD-TK1000, Subcritical Dimension Evaluation Form, Rev. 0, dated February 4, 2013
 SDEF-KCD-TK4100, Subcritical Dimension Evaluation Form, Rev. 0, dated February 12,
 2013
 SDEF-KCD-TK4200, Subcritical Dimension Evaluation Form, Rev. 1, dated March 26, 2013
 SDEF-KCD-TK1500, Subcritical Dimension Evaluation Form, Rev. 0, dated February 4, 2013

SDEF-KCD-TK4000, Subcritical Dimension Evaluation Form, Rev. 0, dated February 12, 2013

SDEF-KCD-EV5000, Subcritical Dimension Evaluation Form, Rev. 0, dated March 10, 2014

SDEF-KCD-DRIP6900 (6), Subcritical Dimension Evaluation Form, Rev. 0, dated April 1, 2013