



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

January 29, 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 70-3098/2014-004**

Dear Mr. Del Vecchio:

During the period from October 1 through December 31, 2014, the U. S. Nuclear Regulatory Commission (NRC) completed inspections pertaining to the construction of the Mixed Oxide Fuel Fabrication Facility. The purpose of the inspections was to determine whether activities authorized by the construction authorization were conducted safely and in accordance with NRC requirements. The enclosed inspection report documents the inspection results. At the conclusion of the inspections, the findings were discussed with those members of your staff identified in the enclosed report.

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

Based on the results of these inspections, no findings of significance were identified.

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

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

Sincerely,

/RA/

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

Docket No. 70-3098

Construction Authorization No.: CAMOX-001

Enclosure: NRC Inspection Report 70-3098/2014-004
w/attachment: Supplemental Information

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

Sincerely,

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DATE	01/29/2015	01/29/2015	01/28/2015	01/29/2015	01/28/2015		
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Letter to David Del Vecchio from Deborah Seymour dated January 29, 2015.

SUBJECT: MIXED OXIDE FUEL FABRICATION FACILITY- NRC INSPECTION REPORT
NUMBER 70-3098/2014-004

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U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.: 70-3098

Construction
Authorization No.: CAMOX-001

Report No.: 70-3098/2014-004

Applicant: CB&I AREVA MOX Services

Location: Savannah River Site
Aiken, South Carolina

Inspection Dates: October 1 – December 31, 2014

Inspectors: C. Huffman, Acting Senior Resident Inspector, Construction Projects
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(RII)
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Accompanying
Personnel: D. Ayres, Branch Chief, CPB2, DCP, RII
D. Tiktinsky, Senior Project Manager, Fuel Manufacturing Branch (FMB),
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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 70-3098/2014-004

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

The principle systems, structures and components (PSSCs) discussed in this inspection report are PSSC-009, Criticality Controls; PSSC-036, MOX Fuel Fabrication Building; PSSC-023, Fluid Transport Systems; and PSSC-024, Gloveboxes.

Routine Resident Inspections

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

PSSC Inspections

PSSC-009, Criticality Controls

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 Aqueous Polishing Building (BAP). The attributes observed were procedure controls and installation. The associated items relied on for safety (IROFS) components were annular and slab type tanks located in the first level of the BAP. The inspectors concluded that tank installation and quality control (QC) inspection activities relating to criticality control were acceptable. No findings of significance were identified (Section 3.a).

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 inspectors performed direct measurements and observations to determine whether closure of temporary construction openings (TCOs) in accordance with code requirements was achieved for areas in the BAP. The attributes observed were fabrication, procedure controls and installation. The associated IROFS components were reinforcing bar, mechanical couplers and embed plates located on the second and third level of the BAP. The inspectors concluded that installed items necessary for TCO closure and QC inspection activities were acceptable. No findings of significance were identified (Section 3.b).

PSSC-023, Fluid Transport Systems

The inspectors observed construction activities related to PSSC-023, Fluid Transport Systems, as described in Table 5.6-1 of the MFFF CAR. The inspection attributes observed were fabrication, special processes (welding), procedure controls, and installation. The associated IROFS components were process piping, scrubbing columns, and supporting structures. The inspectors observed welding of piping sections in the BAP active gallery and secure warehouse. The inspectors concluded that piping installation (welding) and piping QC inspection activities were acceptable. No findings of significance were identified (Section 3.c).

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)
- Grinding (PRE)
- Purification Cycle (KPA)
- Assembly Solvent Recovery Unit (KPB)
- Green Pellet Storage (PSE)

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.d).

Programmatic Inspections

Quality Assurance: Program Development and Implementation (Inspection Procedure (IP) 88106)

Classification of IROFS

MOX Services adequately evaluated IROFS components using the Relative Importance to Safety (RITS) ranking Project Procedure (PP) 9-41, IROFS Relative Importance to Safety (RITS) Ranking, Rev.0. The inspection of the samples of the RITS ranked IROFS components provided reasonable assurance that the IROFS component rankings were defensible and ranked to the appropriate RITS ranking category. No findings of significance were identified (Section 4.a. (1)).

Quality Assurance Training

Based on the review of the applicant's staff qualifications for auditors and QC personnel, the inspectors concluded that staff qualifications were consistent with the both project procedure and MPQAP requirements for auditors and QC personnel. No findings of significance were identified (Section 4.a. (2)).

Management Assessments and Audits

The inspectors verified that the applicant's programs for conducting management assessments and audits were implemented in accordance with the MPQAP commitments and requirements. No findings of significance were identified (Section 4.a. (3)).

Quality Assurance: Design and Documentation Control (IP 88107)

The applicant adequately implemented Quality Assurance (QA) requirements into drawings, calculations, and design specifications. Inspectors also verified that the design change control program was implemented in accordance with the MQAP requirements. The design inputs and process for translating them into fabrication activities related to PSSC-024, Gloveboxes, was also verified as being adequately followed in accordance with MQAP commitments and consistent with the regulatory requirements. No findings of significance were identified (Section 4.b)

Quality Assurance: Control of Materials, Equipment, and Services (Inspection Procedure (IP) 88108)

Programmatic Review of Commercial Grade Item Dedication

MOX Services adequately performed commercial-grade item dedication activities in accordance with the MPQAP and project procedure requirements. The inspection of the samples of commercial-grade items provided reasonable assurance that they were procured in a manner consistent with regulatory and QA plan requirements. No findings of significance were identified (Section 4.c. (1)).

Programmatic Review of Storage of QL-1 Materials

Requirements for handling storage and shipping, as specified in the MPQAP, were performed 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, rigging, 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.c. (2)).

Quality Assurance: Inspection, Test Control and Control of Measuring Equipment (IP 88109)

The equipment used for measuring and testing was adequately controlled by procedures that contained the appropriate acceptance criteria. The inspection and testing activities were completed by qualified personnel using measuring and test equipment (M&TE) that was calibrated and maintained, and the activities were documented in accordance with the procedures. No findings of significance were identified (Section 4.d).

Quality Assurance: 10 CFR 21 Inspection – Facility Construction (IP 88111)

The applicant implemented procedures that met the requirements of 10 CFR Part 21, Reporting of Defects and Noncompliance. The disposition of items placed into the Part 21 program was completed in accordance with the governing procedures and met the requirements of 10 CFR Part 21. No findings of significance were identified (Section 4.e).

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 electrical switchgear in the Shipping and Receiving Building (BSR); installation of fire doors and dampers in the BAP and BMP; and installation of powder, pellet, and rod assembly gloveboxes in the BMP. The applicant continued to receive, store, assemble, and test gloveboxes and process equipment at the Process Assembly Facility (PAF).

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

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 warehouse facilities 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 noted that the applicant entered issues identified during self-assessments into the corrective action system.

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 observed routine lifts conducted to position gloveboxes. The lifts were conducted in accordance with the applicant's procedures. Specifically, the inspectors

verified that installations of supports and gloveboxes were in accordance with applicable field drawings and met the general construction notes.

The inspectors observed installation of piping supports and ventilation supports. The inspectors verified that the installations were in accordance with applicable installation work package guidance.

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

b. Conclusions

The inspectors 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. **PSSC Related Inspections**

a. **PSSC-009, Criticality Control**

(1) Attributes: Procedure Controls 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 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 items relied on for safety (IROFS) components were annular and slab type tanks located in the first level of the BAP.

The inspectors performed a walk down of room C135 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) Conclusions

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 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.

b. PSSC-036, MOX Fuel Fabrication Building Structure

(1) Attributes: Fabrication, Procedure Controls 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 construction activities related to PSSC-036, MOX Fuel Fabrication Building Structure, as described in Table 5.6-1 of the MFFF CAR. The inspectors performed direct measurements and observations to determine whether closure of temporary construction openings (TCOs) were in accordance with code requirements and achieved for areas in the BAP. The attributes observed were fabrication, procedure controls and installation. The associated IROFS components were reinforcing bar, mechanical couplers and embed plates.

The inspectors reviewed in process and completed work associated with the closure of TCOs on the west end of the active gallery for the second and third levels. The inspectors observed the condition of existing embedded rebar couplers to determine whether the threads were adequately protected since the time of their installation. The inspectors observed the condition of threads on the rebar being installed in the couplers to determine whether the threads were in good condition and free of rust. The inspectors compared the installed condition of the rebar and embed plates to applicable drawings and engineering change requests to determine whether they met current design requirements. The inspectors also verified through quality control personnel and documentation that sister rebar splice testing was conducted with satisfactory results. The inspectors observed the installation of rebar, embed plates and formwork to determine whether the installed condition met the requirements of American Concrete Institute 349, Code Requirements for Nuclear Safety-Related Concrete. Specifically, the inspectors observed the development length and clear cover of rebar for code compliance. The inspectors also verified cleanliness of the third level TCO prior to concrete placement.

(b) Conclusions

The inspectors observed construction activities related to PSSC-036, MOX Fuel Fabrication Building Structure, as described in Table 5.6-1 of the MFFF CAR. The inspectors performed direct measurements and observations to determine whether closure of TCOs was in accordance with code requirements and was achieved for areas in the BAP. The attributes observed were procedure controls and installation. The associated IROFS components were reinforcing bar, mechanical couplers and embed plates located on the second and third level of the BAP. The inspectors concluded that installed items necessary for TCO closure and QC inspection activities were acceptable. No findings of significance were identified.

c. **PSSC-023, Fluid Transport Systems**

(1) Attributes: Fabrication, Special Processes, Procedure Controls, 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 construction activities related to PSSC-023, Fluid Transport Systems, as described in Table 5.6-1 of the MFFF CAR. The inspection attributes observed were fabrication, special processes (welding), procedure controls, and installation. The associated IROFS components were process piping, scrubbing columns, and supporting structures.

During the inspection period, the applicant continued welding piping and mounting piping in BAP room C-234 (active gallery) and secure warehouse. The inspectors also observed welding after the final QC inspections. The inspectors observed piping and structural welds on support rack modules 13N, 14N, and 15N as they were assembled in the secure warehouse. The inspectors observed structural welds for the pipe rack modules completed at the vendor and MOX facility to determine whether they were made and installed in accordance with the applicable drawings and American Welding Society code, D1.6, Structural Welding Code – Stainless Steel, 1999 edition (AWS D1.6). The inspectors concluded that structural steel installation, piping installation (welding) and associated QC inspection activities were acceptable.

The inspectors performed a visual inspection of Offgas Treatment Unit (KWG) scrubbing columns KWG1000 and KWG2000 in their installed location to verify the columns and the supporting structural steel were made and installed in accordance with the applicable drawings and AWS D1.6. These scrubbing column inspections focused on the upper elevations that were made accessible due to scaffolding installation in this quarter.

The inspectors performed a visual inspection of installed support rack modules in the active gallery to determine whether the welds met the fit-up and visual inspection requirements of AWS D1.6. The inspectors observed base metal preparation on embed plates to determine whether cleanliness requirements were met prior to weldment of attachments.

The inspectors observed welds for active gallery piping including, but not limited to, the following to determine whether the welds met the acceptance criteria of ASME B31.3:

- KCD-DS-PLI-T-0114414A-03-FW001
- KCD-DS-PLI-T-0114414B-03-FW001
- KCD-DS-PLI-T-0114414C-03-FW001
- KCD-DS-PLI-T-0114414D-03-FW001
- KCD-DS-PLI-T-0114414E-03-FW001
- KCD-0112201-03-Q1-F01CA
- KCD-0112201-03-Q1-F03NB
- KCD-0112201-03-FW002-C0R0
- KPB-0047701-030FW001-C0R0
- KPB-0041100-030FW002-C0R0

- KCD-DS-PLI-T-014414A-03-FW001
- KCD-DS-PLI-T-014414B-03-FW001
- KCD-DS-PLI-T-014414C-03-FW001
- KCD-DS-PLI-T-014414D-03-FW001
- KCD-DS-PLI-T-014414E-03-FW001
- KCD-DS-PLI-T-5458100-01-FW004-C0R0
- KCD-DS-PLI-T-5458100-01-FW005-C0R0
- LGF-2551301-14-FW001-C0R0

The inspectors also performed a visual inspection on tank LGF*TK7400 and demister KWG*DMST1400 to determine whether their respective welds were in compliance with code requirements.

The inspectors reviewed completed welds with QC personnel to determine whether weld quality was acceptable, material traceability had been preserved, documentation was adequate and all necessary QC inspections had occurred. The inspector observed a QC inspector as they demonstrated an inspection on pipe spools installed in the active gallery.

The inspectors observed the removal of arc strikes on active gallery piping and reviewed the arc strike removal and subsequent nondestructive examination to determine whether the affected base metal was free of defects.

(b) Conclusions

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

d. PSSC-024, Gloveboxes

(1) Attribute: 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 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)
- Grinding (PRE)
- Purification Cycle (KPA)

- Assembly Solvent Recovery Unit (KPB)
- Green Pellet Storage (PSE)

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.d).

The inspectors observed in process welding of weld number PSE-MG-PLE-M-01100-FW103-C0R0 joining Green Pellet Storage 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 installations that were necessary to achieve proper clearance for rotating fire doors on NTM link glove boxes.

The inspectors performed visual observations and measurements on KPA and 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 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 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 inspector also performed a review of the inspection results to determine if identified indications were appropriately dispositioned.

(b) Conclusions

The inspectors observed construction activities and reviewed records related to PSSC-024, Gloveboxes, as described in Table 5.6-1 of the MFFF CAR. The inspection attributes observed were procedure controls, special processes and installation. The inspectors observed installation, repair, rework, alignment of the glovebox units, welding and procedure control activities associated with the gloveboxes as noted in the Scope and Observations section. No findings of significance were identified.

4. Programmatic Inspections

a. Quality Assurance: Program Development and Implementation (IP 88106)

(1) Classification of IROFS

(a) Scope and Observations

The inspectors reviewed MOX Services newly implemented relative importance to safety (RITS) ranking program for low importance to safety IROFS. These low importance to safety IROFS were designated as quality level 1 low risk (QL1-LR) items. MOX Services defined this augmented quality assurance program for QL1-LR items in Attachment B of the MPQAP. Implementation of the RITS ranking program was specified in PP 9-41, IROFS Relative Importance to Safety (RITS) Ranking, Rev.0, November 5, 2012. The inspectors noted that the applicant maintained an IROFS component database with a RITS ranking assigned to each component. The inspectors selected the following sample of IROFS components with both high (QL1) and low (QL1-LR) RITS rankings from the database in order to evaluate the applicant's implementation of PP 9-41:

1. KPA*GB3000, Pu Nitrate Feed Instrumentation Glove box (RITS evaluation numbers 38509, 38491, and 38615)
2. KPC*DRIP1900, Drip Tray (RITS evaluation number 38588)
3. PFE*THC1120A, PLC Function Accessible in Primary Location (RITS evaluation number 38506)
4. HDE*DMPF0112B, Fire Damper, High Depressurization Exhaust (RITS evaluation number 38473)
5. HSA*DMPF0102B-03, Fire Damper, Supply Air System (RITS evaluation number 38507)
6. POE*DMPF0137C, Fire Damper (RITS evaluation numbers 38507 and 38516)
7. VHD*ATV1105, Dump Valve (RITS evaluation number 39617)
8. VHD*PDAL4264B-01, Discrete Single Function Instrument, Field Mounted (RITS evaluation number 38612)
9. VHD*AOV0240B-01, Control Valve (RITS evaluation number 38503)
10. KPA*R02200, Restriction Orifice KPA*GB2000 Mounted (RITS evaluation number 38504)
11. KDD*DP1234, Double Wall Pipe (RITS evaluation number 38485)
12. BMP*FD0130-N, Personnel Fire Door (RITS evaluation number 38514)
13. HVC*TSH0318D, Temperature Indicating Switch (RITS evaluation number 38499)
14. IAS*FLT3765B-01, Emergency Scavenging Air After-Filter (RITS evaluation number 38601)
15. KCA*LHC1000B, PLC IROFS Level Controls for AP Tank High Level Instrumentation (RITS evaluation number 38466)
16. KCA*THC8104A, PLC for IROFS Temperature Controls for the Oxalic Precipitation Filtration and Oxidation Unit furnace (RITS evaluation number 38469)
17. KDD*FLT1007, HEPA filter (RITS evaluation number 38585)

The inspectors verified that the applicant performed the RITS evaluation for the IROFS components noted above in accordance with PP 9-41. Specifically, the inspectors verified that the IROFS RITS ranking evaluation process included the following: (1) IROFS ranking bases; (2) normal operation review; (3) initiating event identification; (4) ranking criteria evaluation; (5) IROFS ranking results; (6) overall risk summary; (7) final

RITS category; (8) final RITS ranking evaluation report; and (9) Nuclear Safety Peer Review and Comment Resolution. The inspectors verified that the final RITS category recommendation for the IROFS components noted above were provided with justifications that included reasonable engineering judgment and in most cases appropriate references to engineering calculations, fire hazards analysis, basis of design for fire protection and detection systems, National Fire Protection Association standards, piping and instrument diagrams, nuclear safety evaluations of natural phenomena hazards and external man-made hazards, explosion events, aqueous polishing radiolysis risk analysis loss of confinement, fire events, and load handling events, implementation guidelines for the safety programmable logic control (SPLC) interface layer in the normal programmable logic control (PLC), engineering change requests, radiological consequences of potential releases from nuclear safety events, and hazard and operability analyses of the oxalic precipitation unit and the de-chlorination and dissolution unit.

The inspectors also reviewed the following two condition reports pertaining to the RITS evaluation program:

1. 10888-MOX-CR-14-143, RITS Evaluation Procedure Compliance Weaknesses, May 5, 2014
2. 10888-MOX-CR-14-196, QL-1LR Spreadsheet Inconsistencies, June 24, 2014

The inspectors noted that in 10888-MOX-CR-14-143, the applicant had identified that the justifications provided in a sampling of the RITS evaluations reviewed did not identify the inputs that were used as support for the justification provided. The inspectors noted that RITS evaluations performed subsequent to the 10888-MOX-CR-14-143 finding provided the appropriate references for the RITS evaluations.

The inspectors also discussed with the applicant the consistency of RITS evaluations when implementing PP 9-41. Specifically, the inspectors discussed with MOX Services the importance of the responsibility of the Nuclear Safety peer review group (NSPRG) that was mentioned in Section 2.0 and 3.3.10 of PP 9-41. The applicant discussed providing a definition of the NSPRG in PP 9-41 emphasizing the importance of this function in IROFS RITS ranking. The inspectors also interviewed a member of the NSPRG in order to get a better understanding of the criteria that were used as the basis for the RITS ranking of IROFS components. The inspectors were satisfied that the peer review process provided reasonable assurance that control groups IROFS were designated in the appropriate QL1 or QL1-LR category.

(b) Conclusions

MOX Services adequately evaluated IROFS components using the RITS ranking project procedure PP 9-41. The inspection of the samples of the RITS ranked IROFS components provided reasonable assurance that the IROFS component rankings were defensible and ranked to the appropriate RITS ranking category. No findings of significance were identified.

(2) Quality Assurance Training

(a) Scope and Observations

The inspectors reviewed qualification records of auditors to determine whether the individuals had received the proper quality assurance training based on their scope of work. The applicant specified its requirements for auditors in the MPQAP and for quality control personnel in PP3-27, Quality Control Personnel Certification/Construction Department Inspection Certification, Rev. 6.

The inspectors reviewed a sample of certification records for MOX Services personnel that were qualified to perform audits and quality control work. The inspectors verified that the training certification records and the experience level of the individuals were consistent with the MPQAP and PP 3-27 requirements.

(b) Conclusions

Based on the review of the applicant's staff qualifications for auditors and QC personnel, the inspectors concluded that staff qualifications were consistent with the both project procedure and MPQAP requirements for auditors and QC personnel. No findings of significance were identified.

(3) Management Assessments and Audits

(a) Scope and Observations

The inspectors reviewed the applicant's programs for conducting management assessments and audits to verify that the program elements were implemented in accordance with the MPQAP. Specifically, the inspectors reviewed written procedures PP 3-11, Assessments; and PP 3-7, Audits; and verified they were established and approved per the MPQAP. The inspectors reviewed the calendar year (CY) 2014 Internal Audit Schedule and a list of performed management and project assessments to confirm adequate scheduling and frequency was accomplished in accordance with the approved procedures.

The inspectors also reviewed a sample of assessments, surveillances, and audits to verify they were performed and reported in accordance with the approved procedures. Specifically, the inspectors verified that for each audit and assessment (1) there was an approved plan with an approved checklist; (2) the team members were identified and had proper qualifications; (3) the follow-up items from the previous assessment were addressed; (4) any new issues identified were documented and entered into the applicant's corrective action program; and (5) the report was signed and issued appropriately and in a timely manner.

(b) Conclusions

The inspectors verified that the applicant's programs for conducting management assessments and audits were implemented in accordance with the MPQAP commitments and requirements. No findings of significance were identified.

b. Quality Assurance: Design and Documentation Control (IP 88107)**(1) Scope and Observations**

This inspection was conducted to verify whether design changes were controlled in accordance with commitments and requirements in the MPQAP, Rev. 13. The design control program was reviewed to determine if it was adequately defined, including effective procedures identifying design input controls, processes, analyses, verifications, change controls; and if it adequately translated quality standards into design documents. This was accomplished through design document review, as well as interviews with MOX Services personnel.

The inspectors reviewed design controls of PSSC-024, Gloveboxes, in the associated Pellet Repackaging Unit (PAD) and Jar Handling and Storage Unit (NTM) process units. The latest revisions of MOX Services' project implementing procedures were reviewed including: PP9-21, Engineering Change Requests; PP9-3, Design Control; PP9-7, Drawings, and PP9-16, Basis of Design Documents, in order to assure that the document contents were in accordance with MPQAP commitments. The inspectors interviewed MFFF personnel in the design control group, as well as the glovebox design and fabrication group, in order to determine the design process used and control measures implemented in each program. The inspectors also reviewed a sample of Engineering Change Requests (ECRs) and design documents related to gloveboxes, and associated with PAD and NTM process units. The sample of documents reviewed was selected from those associated with QL-1 construction and design activities. The ECRs were reviewed to verify proper documentation and disposition, and that the design change control process was followed in accordance with procedural requirements by confirming that design changes were adequately applied to affected design documents. The inspectors also reviewed design specifications, design documents, and other design records that were used in the design process of Gloveboxes in the PAD and NTM process units.

Inspectors reviewed the use of design records required by implementing procedures and documents such as EG 405-5, Process Unit Design Package List of Design Documents and Engineering Guidelines; DCS01-PAD-MG-LDT-M-00001-6, Pellet Repackaging Unit List of Design Documents, and DCS01-NTM-MG-LDT-M-00011-4, Jar Storage and Handling Unit List of Design Documents, to verify that changes to listed design input and output documents were accurately reflected and in accordance with procedural requirements. Design Verification Reviews were reviewed in order to confirm that design changes were justified properly and in accordance with QA requirements. The inspectors also reviewed drawings and calculations, and procurement documents such as Bill of Materials (BOMs) that were affected by design changes, and assured that changes were adequately translated into affected design documents and procedurally controlled in accordance with MQAP requirements.

(2) Conclusions

The inspectors verified that the applicant adequately implemented QA requirements into drawings, calculations, and design specifications. Inspectors also verified that design change control program was implemented in accordance with the MQAP requirements. The design inputs and process for translating them into fabrication activities related to

PSSC-024, Gloveboxes, was also verified as being adequately followed in accordance with MQAP commitments and consistent with the regulatory requirements. No findings of significance were identified.

c. Quality Assurance: Control of Materials, Equipment, and Services (IP 88108)

(1) Programmatic Review of Commercial Grade Item Dedication

(a) Scope and Observations

The inspectors performed a review of selected project procedures to determine if commercial-grade program definitions were established, described, and consistent with regulatory and QA plan requirements. The inspectors reviewed the following documents:

- PP9-18, Commercial Grade Item Evaluations, Rev. 7;
- DCS01-ZMJ-DS-NTE-N-61504, MFFF Supplier Direction for Commercial Grade Dedication Activities, Rev. 0;
- DCS01-AAJ-DS-PRG-X-66038, MOX Fuel Fabrication Facility Commercial Grade Dedication (CGD) Program Plan, Rev. 1; and
- MOX Project Quality Assurance Plan, Rev. 13

Based on the review of the documents noted above, the inspectors determined that the following requirements were met:

- preferred definitions of critical characteristics, dedicating entity, and dedication were adopted;
- the licensee committed to comply with all provisions associated with the commercial-grade-item dedication definitions; and
- the QA program described the responsibilities and required instructions and procedures for commercial-grade item dedication.

The inspectors reviewed commercial-grade dedication activities to determine if dedication has been performed in accordance with the QA plan. The inspectors reviewed a sample of commercial grade items that have been received or had associated documents revised in the previous year. The inspectors reviewed Commercial Grade Item Evaluation (CGIE) documents to determine whether:

- commercial-grade items were identified as such in approved design output documents;
- the original intended function and design requirements were met for substituted commercial-grade items;
- Critical Characteristics for Acceptance (CCAs), acceptance criteria and methods for dedication were specified; and
- the bases for sampling plans used for commercial-grade-item dedication activities were documented and in accordance with the MOX Fuel Fabrication Facility Commercial Grade Dedication Plan.

Specifically, the inspectors reviewed the following CGIE documents:

- DCS01-ZMJ-DS-CGD-M-66063, CGIE for Structo-Crete, Structural Concrete Panels, Rev. 3;
- DCS01-ZMJ-DS-CGD-M-65802, CGIE for Gloveport Assemblies, Rev. 6;
- DCS01-ZMJ-AG-CGD-E-65848, CGIE for Simple Electrical Components, Rev. 2;
- DCS01-ZMJ-DS-CGD-M-65837, CGIE for Containers Group 2 – Molybdenum Boats and Shoes and Group 5 – Stainless Steel Boxes, Rev. 4;
- DCS01-NDP-DS-CGD-M-65853, CGIE for NDP Homogenizer, Rev. 8;
- DCS01-ZMJ-DS-CGD-M-65819, CGIE for Metallic Bellows, Rev. 5;
- DCS01-EEJ-DS-CGD-E-25208, CGIE for Grounding Cable and Material, Rev. 6;
- DCS01-ZMJ-DS-CGD-M-65917, CGIE for Bonifait Pesage Modified Mettler Toledo Weigh Scale, Rev. 2;
- DCS01-BKA-DS-CGD-M-65865, CGIE for Repair Mortar, Rev. 2;
- DCS01-ZMJ-DS-CGD-M-65901, CGIE for Mettler Toledo Weigh Scales, Rev. 2; and
- DCS01-NPG-DS-CGD-M-65855, CGIE for NPG/H Pellet Press, Rev. 7.

The inspectors reviewed receipt inspection reports associated with commercial-grade items. Specifically, the inspectors reviewed these reports to determine whether:

- items received matched those that were ordered;
- commercial grade acceptance requirements were listed;
- sample plans were completed and in conformance with the requirements of the associated CGIE;
- damage was sustained during shipment; and
- non-conformances identified during the receipt inspection were properly documented and tracked.

Specifically, the inspectors reviewed the following receipt inspection reports which are, in order, a single example of site inspection activities associated with items procured under the CGIE documents listed above:

- 13-44632 (Structo-Crete);
- 11-25735 (Gloveport Assemblies);
- 13-44899 (Simple Electronic Components);
- 09-8478 (Boat Shoes);
- 12-40509 (Homogenizer Assembly);
- 14-50000 (Metallic Bellows);
- 14-51135 (Grounding Cable and Material);
- 14-51172 (Toledo Weight Scale);
- 14-51318 (Repair Mortar);
- 14-51522 (Toledo Weight Scale); and
- 12-35403 (Pelletizing Press).

The inspectors also reviewed verification actions for CCAs that could not be completed at the time of receipt. The inspectors reviewed the Verification Action Log and sampled items in the field to determine whether items which required additional verification were appropriately tracked and tagged.

The inspectors reviewed procedure PP9-32, Equipment Qualification, to determine whether measures were in place to evaluate the adequacy of CGD items that must meet

specific seismic design requirements. The inspectors reviewed ECR documents 20201 and 17122 to determine whether the information necessary to evaluate the CCAs was provided and whether organizational responsibility for verification had been established.

(b) Conclusions

MOX Services adequately performed commercial-grade item dedication activities in accordance with MPQAP and project procedure requirements. The inspection of the samples of commercial-grade items provided reasonable assurance that they were procured in a manner consistent with regulatory and QA plan requirements. No findings of significance were identified.

(2) Programmatic Review of Storage and Lifting of QL-1 Materials

(a) 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, applicable portions of NQA-1, Quality Assurance Requirements for Nuclear Facilities Applications (NQA-1 1994) 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
- Barnwell Storage Facility
- BAP
- Northeast Laydown Yard
- West Laydown Yard
- South Laydown Yard
- 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 lifting and placing of gloveboxes into their installation locations to determine whether lifts were performed in accordance with procedures and without damage. The inspectors reviewed engineering analysis for planned special lifts to determine whether the potential impacts to existing QL-1 structures was accounted for prior to commencement of rigging or lifting activities.

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 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.

(b) Conclusion

Requirements for handling, storage, lifting, and shipping, as specified in the MPQAP, were performed by the applicant in accordance with project procedures. Project procedures provided adequate measures to ensure that applicable requirements of NQA-1 1994, including, but not limited to, storage area designation, rigging, 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.

d. **Quality Assurance: Inspection, Test Control & Control of Measuring Equipment (IP 88109)**

(1) Scope and Observations

The inspectors reviewed the MPQAP to ensure that the requirements for M&TE were adequately transferred into design documents and inspection procedures. The requirements for M&TE are found in the MOX Project Procedure PP3-15, Rev. 6, Control of Measuring and Test Equipment. The inspectors also performed direct inspection of the M&TE control area to ensure that equipment was properly stored and maintained in accordance with PP3-15 and the MPQAP. The inspectors reviewed a sample of M&TE in the storage area to determine if the calibration records were maintained in a manner that would ensure M&TE was controlled, calibrated at specified periods, and adjusted to maintain accuracy within necessary limits. During this inspection the inspectors also reviewed the log of M&TE that was out-of-calibration to verify whether it was segregated and documented appropriately. For the out-of-calibration M&TE the inspectors selected a sample of out of calibration logs to verify whether any work was completed while the equipment was out-of-calibration and if so, whether the work was documented and dispositioned in accordance with the procedure (PP3-15).

The inspectors performed field observations of multiple activities that require the use of M&TE to verify that the M&TE was properly handled and the results were documented as required. While observing the activities in the field, the inspectors reviewed the inspection procedures to verify that the required hold points were included and that they were observed to ensure that items were not inadvertently installed. The inspectors also performed field observations to verify that the status was indicated on the items or in documents traceable to the items. The inspectors reviewed the work procedures to determine if the authority for application and removal of hold tags was specified to QC, and also conducted interviews with the craft workers in the field to verify that they knew the authority required to apply and remove hold tags.

(2) Conclusions

The equipment used for measuring and testing was adequately controlled by procedures that contained the appropriate acceptance criteria. The inspection and testing activities were completed by qualified personnel using M&TE that was calibrated and maintained,

and the activities were documented in accordance with the procedures. No findings of significance were identified.

e. **Quality Assurance: 10 CFR 21 Inspection – Facility Construction (IP 88111)**

(1) **Scope and Observations**

The inspectors reviewed licensee procedure PP8-3, Rev. 6, Evaluation and Reporting of Defects and Noncompliance (10 CFR Part 21), to determine if it was adequate with regards to the requirements of 10 CFR, Part 21. The inspectors reviewed a sample of procurement documents to verify that the applicant implemented the requirements of 10 CFR, Part 21. The inspectors also reviewed a sample of Part 21 reports that did not result in the identification of a defect or failure to comply to determine if the disposition was in accordance with PP8-3. As a part of this review, the inspectors verified that the information in the Part 21 reports was complete and the finding of the evaluation was a logical conclusion.

The inspectors reviewed DCS-NRC-000361, 10 CFR Part 21 Final Report Notification: Cracks in HVAC Filter Housing, and determined that MOX Services met the requirements of 10 CFR Part 21(d) with regards to reporting, report content, and technical adequacy of the evaluation. The 10 CFR Part 21 issue addressed a potential deviation associated with nonconforming welds that resulted in cracks in HVAC Filter Housing repair welds. The final report concluded that a defect existed in six separate filter housings. The inspectors noted that MOX Services identified the cracks during liquid penetrant testing of field welds, and that the cracks were in areas where the vendor completed repair work. The inspectors conducted interviews, reviewed documentation, and conducted field walk-downs to determine if MOX Services took adequate corrective actions to address the weld cracking issue. The inspectors reviewed NCR-13-5235 and concluded that MOX Services took adequate corrective actions to correct the non-conforming condition. The corrective actions taken by MOX Services included approval and implementation of the vendor's rework plan.

(2) **Conclusions**

The applicant was implementing procedures that met the requirements of 10 CFR Part 21, Reporting of Defects and Noncompliance. The disposition of items in the Part 21 program was completed in accordance with the governing procedures and met the requirements of 10 CFR Part 21. No findings of significance were identified.

5. **Exit Interviews**

The inspection scope and results were summarized throughout this reporting period and on January 14, 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

R. Alley, Engineering Assurance Manager
J. Anderson, Quality Assurance (QA) Programs Manager
D. Del Vecchio, Vice President (VP), Project Management
P. Duvall, Nuclear Safety
M. Gober, VP Engineering
D. Gwyn, Licensing/Nuclear Safety Manager
D. Ivey, Project Quality Manager
A. Johnston, Quality Control (QC) Supervisor
R. Justice, Jr., Quality Assurance Programs Manager
D. Kehoe, QA/QC Consultant
M. Maier, Commercial Grade Dedication (CGD) Manager
B. McLaughin, Glovebox Fabrication Manager
E. Radford, Regulatory Compliance
G. Rousseau, MOX Deputy Project Manager
A. Schneider, Project Engineer
E. Thomas, Special Projects Manager
K. Trosen, Lead Welding and Materials Engineer
L. Wood, Regulatory Compliance Manager
R. Whitley, VP Project Assurance
J. Wisniewski, CGD Consultant
D. Yates, Licensing Lead

National Nuclear Security Administration (NNSA)

C. Brizes
G. Ericksen

2. INSPECTION PROCEDURES (IPs) USED

IP 88106	Quality Assurance: Program Development and Implementation (Pre-licensing and Construction)
IP 88107	Quality Assurance: Design and Documentation Control (Pre-licensing and Construction)
IP 88108	Quality Assurance: Control of Materials, Equipment, and Services (Pre-licensing and Construction)
IP 88109	Quality Assurance: Inspection, Test Control, and Control of Measuring and Test Equipment (Pre-licensing and Construction)
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

None.

4. **LIST OF PSSCs REVIEWED**

PSSC-009	Criticality Control
PSSC-023	Fluid Transport Systems
PSSC-024	Gloveboxes
PSSC-036	MOX Fuel Fabrication Building Structure

5. **LIST OF ACRONYMS USED**

ADAMS	Agency-Wide Document Access and Management System
AWS	American Welding Society
BAP	Aqueous Polishing Building
BMP	MOX Processing Building
BOM	Bill of Materials
BSR	Shipping and Receiving Building
CAP	Corrective Action Program
CAR	Construction Authorization Request
CCA	Critical Characteristics for Acceptance
CFR	Code of Federal Regulations
CGD	Commercial Grade Dedication
CGIE	Commercial Grade Item Evaluation
CPB1	Construction Projects Branch 1
CR	Condition Report
CY	Calendar Year
DCP	Division of Construction Projects
DCI	Division of Construction Inspection
ECR	Engineering Change Request
GB	Glovebox
HDE	High Depressurization Exhaust
HVAC	Heating, Ventilation, and Air Conditioning
IP(s)	Inspection Procedure(s)
IROFS	Items Relied on for Safety
KPA	Purification Cycle
KPB	Solvent Recovery
KWG	Off-gas Treatment Unit
LA	License Application
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
NRC	Nuclear Regulatory Commission
NSPRG	Nuclear Safety Peer Review Group
NTM	Jar Storage and Handling Unit
PAD	Pellet Repackaging Unit
PAF	Process Assembly Facility
PLC	Programmable Logic Controller
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
QL-1-LR	Quality Level 1 Low Risk
RII	Region II
Rev.	Revision
RITS	Relative Importance to Safety
SPLC	Safety Programmable Logic Controller
TCO	Temporary Construction Opening
WP(s)	Work Package(s)

6. RECORDS AND DOCUMENTS REVIEWED

Assessment Documents:

CY14-A-CON-014, Activity Assessment Report for Ashred Ahead Bin & Key Accountability, Assessment for All MOX Facility Buildings, 5/28/14 - 6/19/14
 CY-14-M-CON-011, Implementation of the Codeman WDS Computer Software Program, 7/7/14 – 8/6/14
 CY13-A-CSM-027, Procurement Administrative Review, Follow-up Corrective Actions for Review, 9/23/14 - 09/25/14
 CY14-M-QA-14, 2013 PA Management Assessment Report
 CY14-A-QA-010, Contractor Assessment System (DOE Order 226.1B, Attachment A)
 CY14-M-QA-021, Quality Assurance Management Assessment, 8/25/14 – 8/28/14
 CY14-A-ENG-001, Activity Assessment of Interdisciplinary Review and Consistency of Documents, 1/6/14 – 1/31/14
 CY14-M-ENG-005, 14 Engineering management Assessment, 2/5/14 – 4/30/14
 CY14-M-OPS-015, Work Package Planning, Control and Use of Work Instructions, 6/24/14 – 7/3/14
 CY14-A-PMD-002-0, Process Unit Design and Commissioning Work Package Implementation, 3/12/14 – 3/24/14
 CY14-A-QA-010, Contractor Assurance System (DOE Order 226.1B, Attachment A)
 CY14-A-PS-017, Process Reviewed for Assignment of T0 Training Code, 7/23/14 – 10/14/14

Audit Documents:

ANP-14-VE42, Quality Assurance Audit Report, 3/3/14 – 3/7/14 and 4/1/14 – 4/2/14
 BNL-14-VE102, Quality Assurance Audit/Evaluation Report, August 2014
 CASE-14-VE05, Quality Assurance Audit Report, GT STRUDL Analysis Software Development and Maintenance, 2/11/14 – 2/13/14
 DNES-14-VE57, Quality Assurance Audit Report, Unistrut/Pipe Supports (e.g., clamps, rings and fasteners) 3/25/14 – 3/31/14
 FMC-14-NE90, Rev. 1, Quality Assurance Audit Report, Design and Manufacturing of Diesel Generators, 7/21/14 – 7/24/14
 IS4-14-VE148, Quality Assurance Audit Report, Temperature Transmitters, Instrument Support Stands and Restriction Orifice Plates, 6/24/14 – 6/26/14

NEL-13-VE214, Quality Assurance Audit Report, Maintenance and Supply of Fasteners,
12/2/14 – 12/12/14 and 12/17/14 – 12/18/14

Bill of Materials:

DCS01-PAD-MG-NOM-M-13001-1, BMP-Level 1-Room B-140, Pellet Repackaging Unit
(PAD) Bill of Materials, QL-1a IROFS, Ventilation Assembly, 10/18/07
DCS01-NTM-MG-NOM-M-45008-1, BMP-Level 1-Room B-123, NTM Main Assembly,
Glovebox NTM*GB1000G Main Assembly, QL-1, 1/21/09

Calculations:

DCS-01-PAD-MG-CAL-M-00053-1, BMP-Level 1-Room B-140, Pellet Repackaging Unit
(PAD), QL-1a IROFS, Glovebox Structural Integrity Qualification, 10.18.07

Calibration Reports:

Certificate #1417545, Serial Number: 11099330
Certificate #1348062, Serial Number: 199173
Certificate #1401449, Serial Number: 1150
Certificate #1301533, Serial Number: 1211119094

Commercial Grade Item Evaluations:

DCS01-ZMJ-DS-CGD-M-66063, CGIE for Structo-Crete, Structural Concrete Panels, Rev. 3
DCS01-ZMJ-DS-CGD-M-65802, CGIE for Gloveport Assemblies, Rev. 6
DCS01-ZMJ-AG-CGD-E-65848, CGIE for Simple Electrical Components, Rev. 2
DCS01-ZMJ-DS-CGD-M-65837, CGIE for Containers Group 2 – Molybdenum Boats and
Shoes and Group 5 – Stainless Steel Boxes, Rev. 4
DCS01-NDP-DS-CGD-M-65853, CGIE for NDP Homogenizer, Rev. 8
DCS01-ZMJ-DS-CGD-M-65819, CGIE for Metallic Bellows, Rev. 5
DCS01-EEJ-DS-CGD-E-25208, CGIE for Grounding Cable and Material, Rev. 6
DCS01-ZMJ-DS-CGD-M-65917, CGIE for Bonifait Pesage Modified Mettler Toledo Weigh
Scale, Rev. 2
DCS01-BKA-DS-CGD-M-65865, CGIE for Repair Mortar, Rev. 2
DCS01-ZMJ-DS-CGD-M-65901, CGIE for Mettler Toledo Weigh Scales, Rev. 2
DCS01-NPG-DS-CGD-M-65855, CGIE for NPG/H Pellet Press, Rev. 7

Condition Reports:

10888-MOX-CR-14-143, RITS Evaluation Procedure Compliance Weaknesses, 5/5/14
10888-MOX-CR-14-196, QL-1LR Spreadsheet Inconsistencies, 6/24/14
10888-MOX-CR-14-246, Potential 10 CFR Part 21 NCR Reviews

Design Verification Review and Summary:

FORM PP9-3C, Design Verification Review and Summary, ECR-022747, Rev 0, 12/20/14
FORM PP9-3C, Design Verification Review and Summary, ECR-022747, Rev 0, 1/15/14
FORM PP9-3C, Design Verification Review and Summary, ECR-022431, Rev 2, 11/22/14

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
DCS01-PAD-MG-PLI-M-00102, Rev 1, 10/18/07
DCS01-PAD-MG-PLI-M-13101, Rev 1, 10/18/07
DCS01-PAD-MG-PLI-M-10101, Rev 3, 1/20/10

Design Documents:

DCS01-PAD-MG-LDT-M-00001-6, BMP-Level 1-Room B-140, Pellet Repackaging Unit
(PAD), List of Design Documents, QL 1, 1/21/10
DCS01-NTM-MG-LDT-M-00011-4, BMP-Level 1-Powder Area, Jar Storage
and Handling Unit, List of Design Documents, QL1, 8/5/14

Engineering Change Requests

ECR 022747, Rev 0, 1/15/14
ECR 20201
ECR 17122
ECR 001254, Rev 0, 10/27/08
ECR 024278, Rev 0, 7/16/14
ECR 023161, Rev 0, 1/28/14
ECR 023040, Rev 0, 1/13/14
ECR 002970, Rev 2, 10/7/14
ECR 022431, Rev 2, 9/19/13
ECR 021466, Rev 0, 05/15/14
ECR 022455, Rev 0, 10/2/13
ECR 021848, Rev 2, 7/14/14
ECR 022285, Rev 1, 3/12/14
ECR 020278, Rev 3, 4/22/14
ECR 015648, Rev 1, 9/19/13
ECR 011773, Rev 2, 10/24/13
ECR 024615, Rev 0, 9/22/14
ECR 024835, Rev 0, 9/29/14
ECR 024725, Rev 0, 9/24/14
ECR 024753, Rev 0, 9/18/14
ECR 024742, Rev 0, 9/11/14
ECR 024754, Rev 0, 9/12/14
ECR 017675, Rev 4, 8/06/14
ECR 024670, Rev 0, 8/28/14

Nonconformance Reports

13-5229 (Simple Electronic Components)
 09-1478 (Boat Shoes)
 14-5671 (Homogenizer Assembly)
 10888-MOX-NCR-13-5235
 10888-MOX-NCR-13-5328
 10888-MOX-NCR-14-5424
 10888-MOX-NCR-14-5792

Part 21 Evaluation Reports

DCS-NRC-000361
 2013-52
 2013-59
 2014-04
 2014-12
 2014-16
 2014-18
 2014-19

Project Documents

DCS01-ZMJ-DS-NTE-N-61504, MFFF Supplier Direction for Commercial Grade Dedication Activities, Rev. 0;
 DCS01-AAJ-DS-PRG-X-66038, MOX Fuel Fabrication Facility Commercial Grade Dedication (CGD) Program Plan, Rev. 1
 EG 405-5, Process Unit Design Package List of Design Documents, Engineering Guidelines, 9/11/12
 ED 1700-15, Engineering Director, Review and Approval of PUDC Engineering and Design Documents, 6/21/11
 MOX Project Quality Assurance Plan, Rev. 13

Project Procedures

PP 1-1, Quality Assurance Grading, Rev. 2, 5/15/14
 PP3-5, Control of Nonconforming Items, Rev. 10
 PP3-6, Corrective Action Process, Rev. 16, 6/26/14
 PP3-7, Audits, Rev. 8, 3/11/14
 PP3-11, Self-Assessments and Process Improvements, Rev. 10, 4/1/14
 PP3-15, Control of Measuring and Test Equipment, Rev. 6,
 PP3-27, Quality Control Personnel Certification/Construction Department Inspection Certification, Rev. 6
 PP3-30, Quality Control Inspection Plans & Inspection Reports, Rev. 4
 PP 3-32, Visual Welding Inspection Criteria, Rev. 0
 PP8-3A, Rev. 5, Part 21 Evaluation Form
 PP9-1, SSC Quality Levels and Marking Design Documents, Rev. 16, 10/13/14
 PP9-3, Design Control, Rev. 21, 8/27/14
 PP9-7, Rev 13, Drawings, 2/7/13
 PP9-8, Technical Documents, Rev. 11, 6/23/14
 PP9-8, Rev 11, Technical Documents, 1/12/12
 PP9-9, Rev 15, Engineering Specifications, 10/10/14

PP9-14, Rev 6, Design Process, 4/2/12
 PP9-16, Rev. 8, Basis of Design Documents, 2/3/14
 PP 9-18, Commercial Grade Item Evaluations, Rev. 7
 PP 9-21, Engineering Change Request, Rev. 11
 PP9-32, Equipment Qualification, Rev. 3
 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
 PP9-41, IROFS Relative Importance to Safety (RITS) Ranking, Rev.0, 11/5/14
 PP11-20, Rev 3, Field Change Requests, 6/11/14
 PP 11-51, AWS D1.1 and D1.6 General Welding Procedure, Rev. 2

Purchase Orders:

Purchase Order: 10888-O-00011258; Piping Procurement Specification
 DCS01-KKJ-DS-SPE-M-15125-0, General Piping Procurement Specification
 Purchase Order: 10888-O-00009586; Section F Special Conditions for Fixed-Price Supply
 Subcontracts
 Purchase Order: 10888-O-00006310; Section F Special Conditions for Fixed-Price Supply
 Subcontracts
 Purchase Order: 10888-O-00002738; Attachment 5 – Statement of Work and Interface
 Requirements for Shop Fabricated Supports and Supply of Metal Shapes for MFFF,
 Revision 0
 Purchase Order: 10888-O-00013507

QA Auditor and QC Inspectors Training Certifications:

PP3-27R61CN01, Quality Control Personnel Certification/Construction Inspection
 Certification, Rev. 6, 7/14/14

Receipt Inspection Reports:

13-44632 (Structo-Crete)
 11-25735 (Gloveport Assemblies)
 13-44899 (Simple Electronic Components)
 09-8478 (Boat Shoes)
 12-40509 (Homogenizer Assembly)
 14-50000 (Metallic Bellows)
 14-51135 (Grounding Cable and Material)
 14-51172 (Modified Toledo Weight Scale)
 14-51318 (Repair Mortar)
 14-51522 (Toledo Weight Scale)
 12-35403 (Pelletizing Press)

RITS Ranking Documents:

DCS01-AAS-DS-ANS-H-38588-0, RITS Evaluation of IROFS Process Cell Drip Trays
 Credited for Loss of Confinement and Explosion Events, 8/13/14

DCS01-AAS-DS-ANS-H-38616-0, IROFS Relative Importance to Safety Ranking Evaluation for Glovebox Vacuum Breaker Valves, 9/25/14

DCS01-AAS-DS-ANS-H-38503-0, IROFS Relative Importance to Safety Ranking Evaluation for Glovebox Differential Pressure Instrumentation and Alarms, 10/9/14

DCS01-AAS-DS-ANS-H-38499-0, IROFS Relative Importance to Safety Ranking Evaluation for HVAC – Emergency Control Room Ventilation (HVC) System, Quality Level 1, 11/6/14

DCS01-AAS-DS-ANS-H-38503-0, IROFS Relative Importance to Safety Ranking Evaluation for Glovebox Ventilation Gas Supply Isolation Valves, 12/9/14

DCS01-AAS-DS-ANS-H-38507-0, IROFS Relative Importance to Safety Ranking Evaluation for Fire Dampers, 12/20/14

DCS01-AAS-DS-ANS-H-38507-0, IROFS Relative Importance to Safety Ranking Evaluation for Fire Dampers, Quality Level 1, Rev. 0, 12/23/14

DCS01-AAS-DS-ANS-H-38506-0, IROFS relative Importance to Safety Ranking Evaluation for Furnace Airlock Temperature Controls, 1/16/14

DCS01-RRJ-DS-ANS-H-38585-1, Relative Importance to Safety Ranking Evaluation of IROFS Process Filters Credited to Mitigate Loss of Confinement Events, Quality Level 1 – IROFS, 1/17/14

DCS01-KKJ-DS-ANS-H-38601-0, Relative Importance to Safety Ranking Evaluation of the Emergency Scavenging Air System Credited for Preventing Explosion Events, Quality Level 1 – IROFS, 2/19/14

DCS01-RRJ-DS-ANS-H-38469-4, Relative Importance to Safety Ranking Evaluation of IROFS Temperature Controls Credited for Loss of Confinement and Explosion Events, Quality Level 1 – IROFS, 3/26/14

DCS01-RRJ-DS-ANS-H-38466-4, Relative Importance to Safety Ranking Evaluation of IROFS Level Controls Credited for Loss of Confinement and Explosion Events, Quality Level 1 – IROFS, 4/15/14

DCS01-AAS-DS-ANS-H-38516-1, IROFS Relative Importance to Safety Ranking Evaluation for HVAC – Process Cell Exhaust (POE) System, 5/4/14

DCS01-AAS-DS-ANS-H-38514-1, IROFS Relative Importance to Safety Ranking Evaluation for Personnel Fire Doors and Frames, Quality Level 1, Rev.1, 8/28/14

DCS01-AAS-DS-ANS-H-38473-1, IROFS Relative Importance to Safety Ranking Evaluation for the High Depressurization Exhaust (HDE) System, Quality Level 1, Rev.1, 9/29/14

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

Surveillance Reports:

SR-QA-14-0201, Review of Relative Importance to Safety Evaluation – POE, Flow Control and Level Control Systems, dated 5/5/14

SR-QA-14-0316, Rescreening of NCRs previously screened for compliance with PP03-05 – Control of Nonconforming Items, Revision 6

Supplier Deficiency Reports:

BFS-13-VS184-02

Verification Action Reports:

14-028 (Metallic Bellows)
 14-024 (Modified Toledo Weight Scale)
 14-035 (Toledo Weight Scale)
 11-3629 (Pelletizing Press)
 14-5711 (Pelletizing Press)

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
 14-BMP0202-PEN-002-V-1925
 14-C234-PEN-P-M-0001-09C-1605

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-PLE-M-01100-FW103-
 C0R0