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

May 11, 2015

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

SUBJECT: MIXED OXIDE FUEL FABRICATION FACILITY- NRC INSPECTION REPORT NUMBER 70-3098/2015-01

Dear Mr. Del Vecchio:

During the period from January 1 through March 31, 2015, the U. S. Nuclear Regulatory Commission (NRC) completed inspections pertaining to the construction of the Mixed Oxide (MOX) Fuel Fabrication Facility (MFFF). The purpose of the inspections was to determine whether activities authorized by the construction authorization and license application were conducted safely and in accordance with NRC requirements. The enclosed inspection report documents the inspection results. At the conclusion of the inspections, the findings were discussed with those members of your staff identified in the enclosed report.

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

Based on the results of this inspection, the enclosed report documents three findings which were determined to involve violations of NRC requirements. However, because these findings were Severity Level IV violations and were entered into your corrective action program, the NRC is treating them as non-cited violations (NCVs) consistent with Section 2.3.2 of the NRC Enforcement Policy. These NCVs are described in the subject inspection report. If you contest the NCVs or the significance of the NCVs, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the United States Nuclear Regulatory Commission, ATTENTION: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region II; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Senior Resident Inspector at the MFFF.

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 No. 70-3098/2015-01
w/attachment: Supplemental Information

cc w/encl: (See next page)

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Sincerely,

/RA/

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cc w/encl: (See next page)

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DATE	05/08/2015	05/08/2015	05/08/2015	05/08/2015	05/08/2015		
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Letter to from Deborah Seymour dated May 11, 2015.

SUBJECT: MIXED OXIDE FUEL FABRICATION FACILITY- NRC INSPECTION REPORT NO. 70-3098/2015-01

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U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.:	70-3098
Construction Authorization No.:	CAMOX-001
Report No.:	70-3098/2015-01
Applicant:	Chicago Bridge and Iron (CB&I) AREVA MOX Services
Location:	Savannah River Site Aiken, South Carolina
Inspection Dates:	January 1 – March 31, 2015
Inspectors:	C. Huffman, Senior Resident Inspector, Construction Projects Branch (CPB) 1, Division of Construction Projects (DCP), Region II (RII)A. Hutto, Senior Resident Inspector, Branch 1, Division of Reactor Projects, RII B. Adkins, Senior Fuel Facility Inspector, Safety Branch (SB), Division of Fuel Facility Inspection (DFFI), RII D. Edwards, Fuel Facility Inspector, SB, DFFI, RII
Accompanying Personnel:	W. Jones, Director, DCP, RII W. Gloersen, Senior Construction Project Inspector, CPB1, DCP, RII S. Smith, Senior Construction Inspector, Construction Inspection Branch 2, Division of Construction Inspection, RII D. Tiktinsky, Senior Project Manager, Fuel Manufacturing Branch, Division of Fuel Cycle Safety and Environmental Review, Office of Nuclear Materials Safety and Safeguards
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 (IR) Number (No.) 70-3098/2015-01

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 sections of the license application (LA) and applicable industry standards. This inspection included, as applicable, the following inspection attributes: corrective action program, installation, test control, design control, and quality assurance.

The principle systems, structures and components (PSSCs) discussed in this inspection report included: PSSC-009, Criticality Controls; PSSC-021, Fire Barriers; PSSC-023, Fluid Transport Systems; PSSC-024, Gloveboxes, and PSSC-036, MFFF Building Structure.

Routine Resident Inspections

The inspectors attended the applicant's construction project status meetings, reviewed the status of work packages maintained at various work sites, conducted daily tours of work and material storage areas; observed installation of mechanical equipment; and reviewed various corrective action documents to assess the adequacy of the MOX Services' corrective action program. Except as noted below, construction activities were performed in a safe and quality-related manner. No findings of significance were identified (Section 2).

PSSC Inspections

PSSC-023, Fluid Transport System

The inspectors observed testing activities related to PSSC-023, Fluid Transport Systems, as described in Table 5.6-1 of the MFFF CAR. The inspection attribute observed was test control. The item relied on for safety (IROFS) component was Oxalic Mother Liquors Recovery (KCD) piping. Specifically, the inspectors observed pneumatic testing of process piping installation. No findings of significance were identified (Section 3.a (1)).

Additionally, 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 attribute observed was installation. The associated IROFS component was active gallery pipe support frames. Specifically, the inspectors observed installed pipe support frames and reviewed documentation associated with its installation and inspection. The detailed inspection activities identified one non-cited violation (NCV) 70-3098/2015-01-01 associated with failure to meet base metal cleanliness requirements on embed plates prior to commencement of welding (Section 3.a (2)).

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 IROFS components were fire dampers located in the MOX Process Building (BMP). No findings of significance were identified (Section 3.b).

PSSC-036, MFFF Building Structure

The inspectors reviewed construction activities related to PSSC-036, MFFF Building Structure (Including vent stack), as described in Table 5.6-1 of the MFFF CAR. The inspection attributes observed were procedures and installation. The associated IROFS component was the BMP column lines M and N closure of temporary construction openings. The detailed inspection activities identified NCV 70-3098/2015-01-02 associated with WP 14-CP20-B123-TCO-CON-C-1448 for failure to establish adequate procedures for installation of rebar mechanical couplers (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)
- Ground and Sorted Pellet Storage (PSJ)

Observations included alignment of the glovebox shells, component installation, internal cleanliness, and welding of the glovebox units. NCV 70-3098/2015-01-03 was identified for improperly dispositioning a non-conforming item as “use-as-is” (Section 3.d).

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 inspection attributes observed were installation and quality assurance. The IROFS associated component was stainless steel drip trays in the Aqueous Polishing Building (BAP) room C-145. No findings of significance were identified (Section 3.e).

Programmatic Inspections

Work Packages

The inspectors determined that MOX Services administrative procedures were adequate in that the current revisions allowed for the development of work packages that comply with the MPQAP. Work packets that were produced had a well-defined scope of work, work steps were clear and required place keeping, appropriate hold points were established, and supporting documents were provided. Completed work packets contained appropriate quality assurance closure documentation and review checklists. The inspectors found that the consensus of the construction personnel interviewed was that the new work packet process was an improvement in that the work was more manageable, well defined, and less cumbersome from a documentation standpoint. The inspectors did note that greater than 50 percent of the current work in the field is being performed using work packages that were developed prior to the MOX Services work package improvement initiative. Completion of this work and closure of these work packages will continue to challenge the organization until all work is performed under the new work packet format. No findings of significance were identified (Section 4).

REPORT DETAILS

1. Summary of Facility Status

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

2. Routine Resident Inspection Activities (Inspection Procedure (IP) 88130, Construction: Resident Inspection Program for On-Site Construction Activities at the Mixed Oxide Fuel Fabrication Facility; IP 88131, Geo/Technical Activities, and IP 88110, Quality Assurance: Problem Identification, Resolution, and Corrective Action)

a. Scope and Observations

The inspectors routinely attended the applicant's construction weekly status meetings. The inspectors routinely held discussions with MOX Services design engineers, field engineers, quality assurance (QA) and quality control (QC) personnel, and subcontractor construction personnel in order to maintain current knowledge of construction activities and any problems or concerns.

The inspectors routinely reviewed the status of work packages (WPs) maintained at various work sites. The inspectors monitored the status of WP completion to verify construction personnel obtained proper authorizations to start work, monitor progress and to ensure WPs were kept up-to-date as tasks were completed.

The inspectors conducted daily tours of material storage and work areas to verify that materials and equipment were properly stored in accordance with QA requirements.

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 MOX Fuel Fabrication Facility (MFFF) work areas to verify that MOX Services' staging of piping, installation of ductwork, and installation of glove-boxes, installation of fire dampers and fire doors met regulatory commitments and procedural requirements.

The inspectors conducted tours of material storage areas to determine if MOX Services was properly storing equipment and materials in accordance with MOX Project Quality Assurance Plan (MPQAP) storage requirements. Specifically, the inspectors assessed MOX Services compliance with Project Procedure (PP) 10-38, Storage and Control of Material.

The inspectors verified that installations of supports and glove boxes 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 performed reviews of WPs and routine walk downs of the areas to verify adequate cleanliness. The inspectors performed routine walk downs of installed piping and tanks to ensure cleanliness control barriers were properly maintained.

b. Conclusions

The inspectors routinely attended the applicant's weekly construction status meetings, reviewed the status of WPs maintained at various work sites, conducted daily tours of work and material storage areas, observed installation of mechanical equipment, and reviewed various corrective action documents to assess the adequacy of the MOX Services' corrective action program. Except as noted below, construction activities were performed in a safe and quality-related manner. No findings of significance were identified.

3. PSSC Related Inspections

a. PSSC-023, Fluid Transport Systems

(1) Attribute: Test Control; IP 88134, Construction: Piping Relied on for Safety

(a) Scope and Observations

The inspection attribute observed was test control. The item relied on for safety (IROFS) component was Oxalic Mother Liquors Recovery (KCD) piping in the BAP. Specifically, the inspectors observed pneumatic testing of process piping installation for line numbers KCD-B3-PR06-0269200-1"-Z150T, KCD-B3-PR06-0269100-1"-Z150T, KCD-B3-VA02-0269301-1/2"-Z300J AND KCD-B3-VA02-0269301-1/2"-Z300J-H.

The inspectors observed the test to determine whether it was conducted in accordance with PP 11-46, Hydrostatic/Pneumatic Test Procedure; Inspection Plan M333, Pressure Testing; and American Society of Mechanical Engineers (ASME) B31.3, Process Piping, requirements. The inspectors verified that gauges used to conduct the pressure test had a current calibration date. The inspectors verified that the test results were recorded on form PP 11-46B.

(b) Conclusion

The inspectors observed construction activities related to PSSC-023, Fluid Transport Systems. The inspection attribute observed was test control. The associated IROFS component was KCD piping. Specifically, the inspectors observed pneumatic testing of process piping installation. No findings of significance were identified.

(2) Attribute: Installation; IP 88134 and IP 55050, Nuclear Welding General Inspection Procedure

(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 Construction Authorization Request (CAR). The inspection attribute observed was installation. The associated IROFS component was active gallery pipe support frames. Specifically, the inspectors observed installed pipe support frames and reviewed documentation associated with its installation and inspection.

The inspectors observed the fit up and measures, if necessary, to correct fit up gaps between embed plates and the hollow structural sections for the pipe support frames on the lowest level of the active gallery (Room C-234). The inspectors reviewed field change requests (FCRs) associated with the interference of construction aid holes in the embeds to determine whether welds were adequately adjusted to maintain the original design strength. The inspectors reviewed the weld quality of completed welds on the embed plates to determine whether they met the requirements of American Welding Society (AWS) D1.6, Structural Welding Code – Stainless Steel; and PP 11-51, AWS D1.1 and D1.6 General Welding Procedure.

MPQAP Section 5, Instructions, Procedures and Drawings, Section 5.1, states, in part, that quality-affecting activities are prescribed by and performed in accordance with documented, approved QA procedures and other approved implementing documents (drawings, specifications, etc.) appropriate to the MOX Project work scope.

MOX Services PP 11-51, Revision 2, Section 3.4.3.2, states, in part, that “approximately one inch adjacent base metal, shall be clean and free from paint, scale, slag, rust, moisture, oil, grease and other foreign material that would prevent proper welding or produce objectionable fumes.”

Contrary to the above, on or before September 17, 2014, MOX Services failed to adhere to PP 11-51 in that approximately one inch adjacent base metal was not clean and free from paint, scale, slag, rust, moisture, oil grease and other foreign material that would prevent proper welding. Specifically, welds attaching frames 13-CP27-C234-FRAME-M-0010 and 12-CP27-C234-FRAME-M-0008 were found with evidence of residual concrete at the toe of the welds (within one inch of the adjacent base metal). Weld C234-PS-03300-FW004 on frame 13-CP27-C234-FRAME-M-0010 was found to have inadequate fusion at the weld toe as documented in MOX Services’ Inspection Report S561-15-0242.

The detailed inspection activities identified one violation associated with failure to meet base metal cleanliness requirements on embed plates prior to commencement of welding.

This finding was determined to be a severity level (SL) IV violation using Section 6.5 of the Enforcement Policy. Because this was a SL IV violation and the example supporting the violation was entered into the applicant’s corrective action program (CR-14-471), this violation is being treated as a non-cited violation (NCV), consistent with Section 2.3.2 of the NRC Enforcement Policy and is identified as NCV 70-3098/2015-01-01, Failure to Meet Base Metal Cleanliness Requirements on Embed Plates Prior to Commencement of Welding.

The inspectors determined that this finding was more than minor because it represented a failure to follow procedures that resulted in an adverse effect on the quality of the construction of safety-related components. Specifically, foreign material on base metal resulted in inadequate fusion of welds which reduced the welds' effective strength. The affected portion of the weld was relatively small and reworked with acceptable results as documented on Inspection Report S561-15-0242. Procedure PP 11-51 was revised to provide workers with more detailed requirements in order to prevent recurrence of this violation.

(b) Conclusion

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 attribute observed was installation. The associated IROFS component was active gallery pipe support frames. Specifically, the inspectors observed installed pipe support frames and reviewed documentation associated with its installation and inspection. The detailed inspection activities identified NCV 70-3098/2015-01-01 associated with failure to meet base metal cleanliness requirements on embed plates prior to commencement of welding.

b. PSSC-021, Fire Barriers

(1) Attribute: Procedures; IP 88136, Construction: Mechanical Components

(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 installed fire dampers:

- HSA*DMPF0169B-01
- MDE*DMPF0169B-02
- HSA*DMPF0169B-02
- MDE*DMPF0143B
- HSA*DMPF0270B

The inspectors verified that the installed fire dampers met the requirements of DCS01-BMF-DS-PLF-A-04509, Revision (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.

The inspectors observed in process welding of damper HSA*DMPF0270B to determine whether QC hold points were observed and the requirements of Weld Technique Sheet D9.1-GT-SS-01 were met. The inspectors verified that appropriate tools were used to prevent the contamination of stainless steel materials.

(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.

c. PSSC-036, MFFF Building Structure (Including Vent Stack)

(1) Attribute: Design Control; IP 88132, Construction: Structural Concrete Activities; and IP 88133, Structural Steel and Support Activities

(a) Scope and Observations

The inspectors observed the installation of rebar and mechanical couplers used to close TCOs in rooms B126, B137, B242 and B243 of the BMP. The inspectors also observed the placement of concrete around fire door assemblies for the closure of the two TCOs in room B219 to determine whether techniques used to place the concrete were in accordance with PP 11-12, Placement of Concrete, Embedded Structural Items and Accessories, Rev. 3.

The inspectors reviewed ECRs 016649, 021239, 22953 and 23100 to determine whether American Concrete Institute (ACI)-349, Code Requirements for Nuclear Safety Related Concrete Structures and Commentary, code requirements were met during the applicants design activities. The inspectors observed rebar and mechanical coupler installation for TCO closure on the M and N column line walls adjacent to the Jar Storage and Handling Unit (NTM) gloveboxes to determine whether work was accomplished in accordance with ECRs 22953 and 23100. Inspectors observed the in-process installation and QC inspection of Zaplock™ rebar couplers used to extend rebar and for the creation of “u-bands” at the tops of the openings.

MPQAP Section 5, Instructions, Procedures and Drawings, Section 5.1, states, in part, that quality-affecting activities are prescribed by and performed in accordance with documented, approved QA procedures and other approved implementing documents (drawings, specifications, etc.) appropriate to the MOX Project work scope.

MOX Service’s specification DCS01-BKA-DS-SPE-B-09330-7 required the Zaplock™ couplers be installed in accordance with the manufacturer recommendations.

Contrary to the above, on or before February 25, 2015, Zaplock™ couplers were not installed in accordance with the manufacturer recommendations. Specifically, WP 14-CP20-B123-TCO-CON-C-1448 and Quality Control Inspection Plan S501, used to perform work and inspection on safety-related rebar coupler installation, were not appropriate to the nature and circumstances of the work performed as they made reference to performing coupler installation to a manufacturer’s recommendation that did not exist in the document control system. Actual work and installer training was performed to another coupler’s manufacturer’s instructions that differed from the Zaplock™ coupler used in this application.

The lack of procedural controls resulted in safety-related rebar couplers that were not installed in accordance with the manufacturer’s recommendations as required.

Specifically, Zaplock™ brand couplers in the MOX facility were not installed in accordance with the Zaplock™ manufacturer's recommendations.

This finding was determined to be a SL IV violation using Section 6.5 of the Enforcement Policy. Because this was a SL IV violation and the example supporting the violation was entered into the applicant's corrective action program (CR-15-066), this violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy and is identified as NCV 70-3098/2015-01-02, Failure to Establish Adequate Procedures for the Installation of Zaplock™ Rebar Couplers.

The inspectors determined that this finding was more than minor because it represented an inadequate implementation of QA procedures for activities which required procedure qualification or technical evaluation. Specifically, the installation process utilized by the applicant was not in accordance with the manufacturer's recommendations and resulted in an indeterminate quality process and construction activity. Failure of rebar couplers due to improper installation could result in degradation to the design capacity of safety related civil structures. MOX services dispositioned the use of the installed couplers as "use as is" due to testing performed through the duration of the project. Splices designated as production test pieces met the required design strength during tensile testing. The inspectors verified that there were no failures of the test pieces during tensile testing.

(b) Conclusions

The inspectors reviewed construction activities related to PSSC-036, MFFF Building Structure (including vent stack), as described in Table 5.6-1 of the MFFF CAR. The inspection attributes observed were procedures and installation. The associated IROFS component was the MOX BMP column lines M and N. The detailed inspection activities identified NCV 70-3098/2015-01-02 associated with WP 14-CP20-B123-TCO-CON-C-1448 for failure to establish adequate procedures for the installation of Zaplock™ rebar couplers.

d. PSSC-024, Gloveboxes

(1) Attribute: Installation; IP 88130 and IP 55050

(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)
- Ground and Sorted Pellet Storage (PSJ)

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.

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 observed storage condition of the gloveboxes to determine whether adequate moisture, temperature, and cleanliness controls were implemented.

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

MPQAP Section 15.2.1, Documenting and Evaluating Nonconforming Items, states, in part, that a nonconforming item (a deficiency in characteristic, documentation, or procedure that renders the quality of an item or activity unacceptable or indeterminate) is properly controlled to prevent its inadvertent test, installation, or use.

Contrary to the above, on January 27, 2015, a nonconforming item was not properly controlled to prevent its inadvertent test, installation, or use. Specifically, NCR-15-5988 documented an evaluation of a cracked Nelson stud on link module glovebox NTM-GB2000G which was dispositioned “use-as-is” with the justification that an AWS D1.6 code nonconformance did not exist. AWS D1.6-1999, Section 7, only allows for radial cracks which are no longer than half the distance from head periphery to the shank. The stud dispositioned in NCR-15-5988 violated this requirement. An extent of condition evaluation performed by the applicant found that there were studs with cracks on embed plates of other similar link modules.

The inadequate disposition of NCR-15-5988 resulted in safety-related nelson studs that were indeterminate with respect to their ability to perform their design function. Specifically, cracked Nelson studs on glovebox NTM-GB2000G exceeded the allowable crack dimensions provided in AWS D1.6 and required additional justification for a “use-as-is” disposition. The applicant performed an evaluation of the affected gloveboxes in NCRs 15-6079 and 15-6082 with all studs containing cracks providing no capacity and achieved acceptable results. Prior to this engineering analysis the affected gloveboxes were indeterminate with respect to their safety function.

This finding was determined to be a SL IV violation using Section 6.5 of the Enforcement Policy. Because this was a SL IV violation and the example supporting the violation was entered into the applicant’s corrective action program (CR-15-057), this violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy and is identified as NCV 70-3098/2015-01-03, Failure to Adequately Control Nonconforming Glovebox Embed Components.

The inspectors determined that this finding was more than minor because it represented an inadequate disposition of nonconforming items for activities which required a technical evaluation. Specifically, the NCR disposition process utilized by the applicant was not consistent with the requirements of MQAP Section 15.2.1 and resulted in an indeterminate quality construction activity.

(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, alignment of the glovebox units, welding and procedure control activities associated with the gloveboxes. The detailed inspection activities identified NCV 70-3098/2015-01-03 associated with NCR-15-5988 for failure to adequately control nonconforming glovebox embed components.

e. PSSC-009, Criticality Controls

(1) Attribute(s): Installation and Procedures; IP 55050

(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 inspection attributes observed were installation and quality assurance. The IROFS associated component was stainless steel drip trays in BAP room C-145.

The inspectors observed in process welding of stainless steel components that compose the drip tray to determine whether QC hold points were observed and the requirements of Weld Technique Sheets D1.6-GM-A-B-01 and D1.6-GTM-A-B-02 were met. The inspectors verified that appropriate tools and methods were used to prevent the contamination of stainless steel materials.

The inspectors observed the fit up of and arrangements of components to determine whether the construction activities were consistent with Work Order 14-C145-Drip-V-0002-2079.

The inspectors observed quality control personnel perform an inspection of weld number 14-C145-DRIP-2079-FW018-C0R0. The inspectors observed quality control personnel verify that proper joint fit-up, adherence to required welding parameters and material traceability were achieved during the work. The inspectors also performed an independent inspection of the same requirements with the same results.

(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 installation and quality assurance. The IROFS associated component was stainless steel drip trays in BAP room C-145. No findings of significance were identified.

4. Non-PSSC Inspections – Review of MOX Work Package Improvement Initiative Implementation; IP 88106, Program Development and Implementation; IP 88107, Design and Document Control; IP 88108, Control of Materials, Equipment, and Services; IP 88134; IP 88135, Pipe Supports and Restraints; IP 88136; and IP 88139, Ventilation and Confinement Systems

a. Scope and Observations

The inspectors performed a review of the MOX Services work package development and implementation processes to determine if they adequately comply with the MPQAP requirements. This inspection was performed to assess the effectiveness of the current revisions of the administrative procedures that were implemented in the spring of 2014 in an effort to improve work package quality. Work package issues and deficiencies identified under previous revisions included missed work steps, missed QC hold points, work performed out of sequence, and various documentation issues.

The current MOX Services work package process subdivides the work package scope into smaller, discreet work packets that can be individually worked and closed out prior to completion of the entire work package. The inspectors reviewed a sample of closed out quality level (QL) QL-1 and QL-1 (low risk (LR)) work packets related to the installation of pipe supports and leak testing of piping systems to assess the effectiveness the work packet closeout process, and to verify that supporting documentation and data were maintained.

The inspectors also reviewed work in progress that involved partial completion of work packets that covered a variety of craft disciplines. These reviews included work associated with glovebox, process equipment, pipe support, fire damper, and shielding installation, as well as system leak testing. The purpose of these reviews were to verify that work steps were performed in sequence, that identified hold points were signed off, and that supporting documentation, drawings and data sheets were maintained.

The inspectors held discussions with the vice president of work control, the work control manager and other work control personnel to obtain the MOX Services perspective on the work package process improvements, and the remaining challenges in closing out existing work being performed under the old work package process. The inspectors also interviewed a number of QC, craft, and engineering personnel in the field to gain a consensus on whether the new work packet approach to managing MOX construction activities has improved the ease of implementation, inspection, traceability, and quality control reviews of the work packages.

b. Conclusions

The inspectors determined that MOX Services administrative procedures were adequate in that the current revisions allowed for the development of work packages that comply with the MPQAP. Work packets that were produced had a well-defined scope of work, work steps were clear and required place keeping, appropriate hold

points were established, and supporting documents were provided. The inspectors also found that completed work packets contained appropriate quality assurance closure documentation and review checklists. The inspectors found that the consensus of the construction personnel interviewed was that the new work packet process was an improvement in that the work was more manageable, well defined, and less cumbersome from a documentation standpoint. The inspectors did note that greater than 50 percent of the current work in the field is being performed using work packages that were developed prior to the MOX Services work package improvement initiative. Completion of this work and closure of these work packages will continue to challenge the organization until all work is performed under the new work packet format. No findings of significance were identified.

5. Follow-up of Previously Identified Items

a. (Closed) Unresolved Item (URI) 70-3098/2010-003-009, Failure to Provide a Compaction Plan as Required by NQA-1, IP 88131

(1) Scope and Observations

During the third quarter of 2010, the inspectors identified an unresolved item (URI) for the failure to provide a qualified/approved compaction plan for compacting the backfill under, around and above the waste process piping as required by ASME Nuclear Quality Assurance Requirements for Nuclear Facilities Applications (NQA-1). At that time, MOX Services civil engineering personnel indicated that the process used to compact the backfill was acceptable and that they would provide the written justification for the process that was used. As a follow-up to the open URI, the inspectors reviewed the technical justification developed by MOX Services to determine if the QA controls in-place at the time of the backfill were sufficient to ensure proper compaction.

The inspectors concluded that technical justification was primarily based on interviews conducted with QC and construction engineering personnel directly responsible for placement of the backfill beneath the waste transfer line. The results from the interviews concluded that QC inspectors verified that the correct compaction equipment and backfill were used, performed direct observation of backfill activities and soil compaction tests, and independently verified that Independent Test Lab (ITL) results met the required specifications for backfill density. The interviews showed that construction engineering verified that the correct lift height, number of passes, and pass overlap of the compaction equipment during backfilling operations met the requirements of NQA-1 Subpart 2.5. The interviews were documented in official QA records and were signed by the involved parties.

In addition, the inspectors reviewed QORE™ field density report #43247 to confirm that the density of the backfill underneath the transfer line met backfill specification requirements. The inspectors reviewed works steps and field notes from Work Package 09-10888-B2272-C-0013 to determine if the steps performed by QC were documented in the work package history. The inspectors also reviewed ECR 008741, Sufficient Inspections and Oversight Provided During Backfilling, which documented the technical justification and interview records. The inspectors conducted on-site interviews with the QA, QC, and construction engineering personnel to gain additional information related to the field activities performed by QC and construction with regards to verification of compaction.

The inspectors concluded that the failure to provide a compaction plan as required by NQA-1 was a minor violation of NRC requirements. Specifically, Attachment A of the MPQAP, states, in part, that the MPQAP follows Subpart 2.5, Quality Assurance Requirements for Installation, Inspection, and Testing of Structural Concrete, Structural Steel, Soils, and Foundations for Nuclear Power Plants. Specifically, the licensee failed to perform and document the inspections described in Sections 5.3, Placing and Compacting Equipment; Section 5.4, Placement Preparations; and Section 5.5, Soils Compaction, of Subpart 2.5. The violation was considered to be minor based on the guidance contained in Appendix E, Examples of Minor Construction Issues, of Inspection Manual Chapter (IMC) 0613, Power Reactor Construction Inspection Reports. Specifically, in accordance with screening question 3, the noncompliance represented an adverse condition that rendered the quality of the system, structure, or component (SSC), unacceptable or indeterminate, but did not require substantive corrective action to correct. This failure to comply with Subpart 2.5 of NQA-1 constitutes a minor violation that is not subject to enforcement action in accordance with the NRC Enforcement Policy.

The inspectors reviewed the licensee's corrective actions to preclude recurrence including a revision to DCS01-WRT-DS-SPE-B-09307 Rev. 3, which now requires the development an NQA-1 compaction plan that specifies the number of passes over each lift, pass overlap, weight of compaction equipment, equipment inspections, and verification of correct vibratory frequency. The inspectors concluded that the corrective actions taken by the licensee were adequate.

(2) Conclusions

Based on a review of the technical justification and the interviews conducted, the inspectors concluded that MOX Services had sufficient quality controls in-place to meet the intent of ASME NQA-1 Subpart 2.5 with regards to soil compaction and URI 2010-003-009, Failure to Provide a Compaction Plan as Required by NQA-1, is closed. The noncompliance resulted in a single minor violation of NRC requirements that was not subject to enforcement action in accordance with the NRC Enforcement Policy.

b. (Closed) Violation (VIO) 2011-001-001, Failure to Ensure that QL-1 Equipment and Services Were Controlled to Assure Conformance with Specified Technical and QA Requirements (5 Examples), IP 88134

(1) Scope and Observations

During the first quarter of 2010, the inspectors identified a SL IV violation with five examples of failure to ensure that procurement of QL-1 material, equipment and services was controlled to assure conformance with specified technical and QA requirements.

In the first example, MOX Services failed to identify the gap spacing between annular tank and Colemanite™ shield panels for KPA TK9500 exceeded the IROFS criticality dimensions identified on DCS01-KPA-CG-PLG-L-060705. The noncompliance was addressed in CRs 11-170 and 11-272, which were reviewed by the inspectors. Corrective actions included evaluations of project procedures, counseling of personnel and the development and implementation of PP 9-39, Rev. 3, Verification of Subcritical Dimensions for Criticality Safety Tank KPA TK9500. Other similar tanks were also inspected for similar conditions. The inspectors also interviewed personnel and Subcritical Dimension Evaluation Forms for KPA TK9500 and similar tanks to verify that

corrective actions were completed. Based on their review, the inspectors concluded that the corrective actions taken by MOX Services were adequate.

In the second example, MOX Services failed to ensure the supplier/subcontractor performed design verification for systems, structures or components as required by Basic Requirement 3 of ASME NQA-1. The noncompliance was addressed in CRs 11-118 and 11-274. The applicant performed design reviews of all documents and professional engineering reviews of selected documents where qualification calculations were implemented. The inspectors verified that additional information on requirements for confirming vendors have adequately performed and documented design verification was added to PP 9-9 and PP 10-14. MOX Services also verified that design verification per NQA-1 was performed for vendor drawings on mechanical subcontracts. Based on their review, the inspectors concluded that the corrective actions taken by MOX Services were adequate.

In the third example, MOX Services failed to identify the dimensions for nozzles P17, P7, and P1 for KCD TK1000 did not meet the required tolerances listed on design drawing 006314-M-1121-3. The noncompliance was addressed in CRs 11-272, 11-170, and NCR QC 11-3037. The nozzles were recommended to be used as is and a technical justification was performed. Based on their review, the inspectors concluded that the corrective actions taken by MOX Services were adequate.

In the fourth example, MOX Services failed to identify that the internal diameter for a Colemanite™ shield panel for KPS TK9500 did not meet the required tolerance listed on design drawing 006314-M-930-2, Rev. 4. The nonconformance was addressed in NCR QC-112953. The NCR found that a Colemanite™ panel for an annular tank was out of tolerance. A review of documents yielded that the tolerance was not imposed by MOX Services but imposed by the vendor to assure proper installation of the Colemanite™ panels. The design verification found that the out of tolerance item did not affect any IROFS or any other design function of the vessels. Based on their review, the inspectors concluded that the corrective actions taken by MOX Services were adequate.

In the fifth example, MOX Services failed to adequately perform commercial grade dedication of Barsplice connectors including verification of critical characteristics. The nonconformance was addressed in CRs 11-272, 11-158, and 11-188. The entire shipment of Barsplice connectors was recovered and scrapped. Subsequently, MOX Services counseled personnel on verification requirements, updated commercial grade documents, and requires that Barsplice connectors be procured only from approved suppliers. Based on their review, the inspectors concluded that the corrective actions taken by MOX Services were adequate.

(2) Conclusions

VIO 2011-001-001, Failure to Ensure that QL-1 Equipment and Services Were Controlled to Assure Conformance with Specified Technical and QA Requirements (5 Examples), is closed based on a review of the associated documentation and corrective actions.

c. (Closed) VIO 70-3098/2011-003-001, Inadequate Work Package Qualitative/ Quantitative Acceptance Criteria (3 Examples), IP 88133

(1) Scope and Observations

In 2011, the NRC identified three examples for failure to provide work instructions that were appropriate to the nature and circumstances of the work being performed. Failure to provide appropriate work instructions resulted in the improper installation of tanks and structural support steel in the BAP.

In the first example, a QC hold point did not provide adequate quantitative or qualitative acceptance criteria for QC personnel to confirm that the structural steel location(s), orientation(s), elevation(s) and levelness requirements were satisfactorily accomplished. This noncompliance was addressed by the corrective actions contained in CR-11-569, Inadequate Work Instruction Details, and in CR11-665. Specific corrective actions included: (1) additional surveillances performed by QC, (2) performance of a root cause analysis (RCA), (3) additional training for construction and QC staff, (4) development of a new work package format, (5) performance of a safety conscious work environment (SCWE) survey, (6) enhancement of procedures for work package development, and (7) performance of human performance training. In addition, the NRC conducted a work package follow-up inspection this quarter and concluded that the corrective actions put in place by MOX Services were adequate to address this noncompliance (refer to Section 4).

In the second example, WP 10-CP27-KCD-TK4100-M did not provide adequate work instructions specifying the required sequencing of hex nut installation and torque requirements resulting in the improper field installation of KCD-TK4100. This resulted in MOX Services improperly installing the standard hex nut first at the full rated torque value, followed by the hex jam nut at 50 percent of its rated torque value, for KCD-TK4100. The inspectors reviewed CR-11-278, Configuration of Nuts on Installed Equipment, and the technical justification for “use as is” contained in ECR-013245. Based on their review of the CR and engineering change request (ECR), the inspectors agreed with the technical justification which states that improper installation of the jam nut did not degrade the capacity of the bolted connection thus maintaining full tension of the hex nut to base plate interface. Locking action is by friction between the two nuts.

In the third example, the work package did not provide adequate work instructions specifying the special torque requirements identified in DCS01-KCD-DS-CAL-L-12089-1, KCD TK1000 / KCD TK2000 / KCK TK4100, American Society of Mechanical Engineers Qualification Calculation of Oxalic Mother Liquors Recovery Tanks, that allow the base plate to slide to accommodate thermal expansion of the frame under process cell accident conditions. This resulted in the improper field installation the 3-tank structure. As a response to this example, the licensee was required to re-perform the structural analysis to verify that the structural connections could withstand the thermal expansion of the frame given fixed boundary conditions in all three translational and rotational directions (e.g. no sliding friction). The calculations showed that the design capacity ratio significantly increased with the fixed boundary conditions but remained less than 1.0; therefore, a “use as is” technical justification was justified.

(2) Conclusions

VIO 70-3098/2011-003-001, Inadequate Work Package Qualitative/ Quantitative Acceptance Criteria (3 Examples), is closed based on a review of the associated documentation and corrective actions.

d. (Closed) VIO 70-3098/2012-001-001, Five Examples for Failure to Provide Work Documents Appropriate to the Nature and Circumstances of the Work Being Performed and to Perform Quality–Affecting Work Activities in accordance with Approved Implementing Documents, IP 88136

(1) Scope and Observations

In 2011, the NRC identified that the documents used to perform QL-1 installation activities were not appropriate to the nature and circumstances of the work being performed; and quality affecting activities were not performed in accordance with documented, approved QA procedures and other approved implementing documents. A total of five examples of work package deficiencies were outlined in the violation. As a result, MOX Services instituted numerous corrective actions to correct the work package deficiencies identified in this violation as well as Violation (VIO) 2011-003-001, Inadequate Work Package Qualitative/Quantitative Acceptance Criteria. The corrective actions are summarized below.

The applicant issued CR-11-569, Inadequate Work Instruction Details, and CR11-665. Specific corrective actions included: (1) additional surveillances performed by QC, (2) performance of a RCA, (3) additional work control training for construction and QC staff, (4) development of a new work package format, (5) performance of a SCWE survey, (6) enhancement of procedures for work package development, and (7) performance of human performance improvement training. Based on their review, the inspectors concluded that the corrective actions taken by MOX Services were adequate to correct the work package deficiencies identified in the two NRC violations. In addition, the NRC conducted a separate follow-up inspection this quarter (refer to Section 4) to determine if the MOX Services work package development and implementation processes adequately complied with the MPQAP requirements.

(2) Conclusions

VIO 70-3098/2012-001-001, Five Examples for Failure to Provide Work Documents Appropriate to the Nature and Circumstances of the Work Being Performed and to Perform Quality–Affecting Work Activities in accordance with Approved Implementing Documents, is closed based on a review of the associated documentation and corrective actions.

e. (Closed) VIO 70-3098/2012-001-002, Two Examples of Failure to Identify Adequate Critical Characteristics, IP 88132

(1) Scope and Observations

During the first quarter of 2012, the NRC identified a SL IV violation for failure to adequately define the necessary critical characteristics to provide reasonable assurance that the Homogenizing and Pelletizing Unit Lodige mixer and the fluid transport system (FTS) piping components would perform their intended IROFS functions.

In the first example, the inspectors reviewed CR-12-017, Inadequate Design Support for NCSE-D Statements Concerning the Lodige Mixers, to determine if MOX Services implemented the necessary corrective actions to correct the nonconforming condition. The corrective actions implemented by the licensee included (1) issuance of ECR-011840, Rev. 2 to update the structural calculation of the Lodige mixer drive train components and (2) revision of the commercial grade item evaluation (CGIE) to incorporate the additions to the structural calculation and to add the necessary critical characteristics and acceptance methods. The inspectors reviewed the revised structural calculation to verify that the design/capacity (D/C) ratios were less than 1.0 for key parts and welds. The inspectors reviewed the new CGIE to ensure that the critical characteristics and acceptance methods were adequate to verify that the component could perform its intended safety function. The inspectors reviewed CGIE test results for the trap door inductive sensors and completed material test reports to confirm that the mixer drive train components were constructed of 300 Series stainless steel. The inspectors reviewed radiography results of the ploughshare welds, connections, and parts and completed dimensional inspection reports.

In the second example, MOX Services failed to define intergranular corrosion (IGC) resistance as a critical characteristic to provide reasonable assurance that the FTS piping and components would perform their intended IROFS function. As a follow-up to this example, the inspectors reviewed CR-12-13, Intergranular Corrosion Testing, to determine if MOX implemented the necessary corrective actions to address the issue. As a corrective action, MOX Services developed DCS01-ZMJ-DS-NTE-M-61502, which defines the FTS applications where IGC testing is required. The analysis concluded that IGC testing is not required for FTS applications inside gloveboxes or double-walled piping or in applications involving dry or non-radioactive applications. The inspectors reviewed the revised CGIE, DCS01-ZMJ-DS-CGD-M-65964, Rev. 5, and verified that IGC is included as a critical characteristic for single-walled FTS components as specified in DCS01-ZMJ-DS-NTE-M-61502.

(2) Conclusions

VIO 70-3098/2012-001-002, Two Examples of Failure to Identify Adequate Critical Characteristics is closed based on a review of the associated documentation and corrective actions.

f. (Closed) VIO 70-3098/2012-001-003, Two Examples of Failure to Identify and Correct Significant Conditions Adverse to Quality, IP 88110 and IP 88108

(1) Scope and Observations

In example one, MOX Services failed to identify and correct a condition adverse to quality in which testing to verify critical characteristics related to chemical and physical properties of mechanical splices was not performed by an approved supplier, as required by DCS01-BKA-DS-CGD-M-65831, Commercial Grade Item Evaluation for Mechanical Splices, Rev. 3. Specifically, as documented in CR-11-158, MOX Services completed a review of receipt inspection reports of mechanical splices to verify they contained the required documentation, but failed to identify and correct an adverse condition where chemical and physical property testing for LENTON™ mechanical splices was not performed by an approved supplier. The nonconformance was addressed in CR 12-060. A Commercial Grade Survey (TTML-12-VS185) of the sub-tier

supplier, Tensile Testing Metallurgical Lab (TTML), was performed to verify the acceptability and implementation of the TTML Quality Assurance Program for the services of chemical composition analysis and mechanical testing. During this survey, the MOX Services audit team also verified that the programs in place at the time of the audit were in place at the time of previous MOX Services purchases. Therefore it was determined that the splices were acceptable. Based on their review, the inspectors concluded that the corrective actions taken by MOX Services were adequate.

In example two, MOX Services failed to implement measures to ensure that the root causes and extent of condition were properly identified and corrective actions were implemented. Specifically, Shaw AREVA MOX Services QA Program (SQAP) Report, SQAP-029, dated June 21, 2011, identified the following adverse trends stating, "The violation of WPs (missed steps and signatures) is a trend issue," and "The repetitive failure of the Condition Report Extent of Condition preparation and analysis to identify programmatic corrective action that would prevent recurrence of an identified adverse condition is a trend issue." The adverse trends were closed without correcting the WP issues pertaining to missed steps and missed signatures and without identifying effective corrective actions for the identified trends. Condition Report 10888-MOX-CR-11-341 was initiated, on June 16, 2011, and closed in October 2011, to address the violation of WPs (missed steps and missed signatures). MOX Services defined this CR as a significant condition adverse to quality. MOX Services failed to perform an appropriate investigation to determine the extent of condition of the WP deficiencies, and extent of condition for the missed signatures, and therefore failed to take appropriate corrective actions to correct the WP deficiencies and to ensure that WP documentation was completed as required, as evidenced by continuing issues with the WPs identified by the NRC. The nonconformance was addressed by revising PP 3-06, Corrective Action Process, to include an investigation and corrective action planning process. Also, the Quality Programs group was established and assigned the owner of the corrective action programs. Based on their review, the inspectors concluded that the corrective actions taken by MOX Services were adequate.

(2) Conclusions

VIO 70-3098/2012-001-003, Two Examples of Failure to Identify and Correct Significant Conditions Adverse to Quality, is closed based on a review of the associated documentation and corrective actions.

g. (Closed) Inspector Follow-up Item (IFI) 70-3098/2012-002-003, Review of Applicant's Resolution of the Improperly Epoxied Rebar Installations (IP 88132)

(1) Scope and Observations

During closure of NCV 70-3098/2010-004-006 in 2012, an Inspector Follow-up Item (IFI) 70-3098/2012-002-003 was identified to perform a detailed review of the applicant's resolution of the epoxied rebar issue. Specifically, MOX Services was not able to evaluate successfully the as left installation as acceptable and must consider the rebar not installed for the final ANSYS analysis.

The inspectors confirmed that MOX Services adequately evaluated all applications in the MFFF where the HILTI epoxy was used for post-installed rebar. MOX Services confirmed that all applications were in a QL-4 application except for the wall and floor elements listed in CR-10-512/AT-10-1637.

The inspectors reviewed CR-09-399, Cumulative Effect of Structural Issues on ANSYS Model, and confirmed that it states that anchorage capacity provided by either of the HILTI epoxy adhesive systems shall not be credited for anchorage of the reinforcing bars. The inspectors reviewed calculation DCS01-XGA-DS-CAL-B-01109, Cumulative Effect of BMF Concrete Structural Issue on Original ANSYS Analysis, Rev. 2, and confirmed that the analysis credited zero epoxy bars as required by CR-09-399, CR-10-513 and CR-12-183.

The inspectors also interviewed personnel from the MOX Services structural engineering group and confirmed that no credit was taken for any rebar that was installed with the HILTI epoxy adhesive.

(2) Conclusions

IFI 70-3098/2012-002-003, Review of Applicant's Resolution of the Improperly Epoxied Rebar Installations is closed based on a review of the associated documentation and corrective actions. The inspectors confirmed that the cumulative effects analysis did not credit any QL-1 rebar that was installed using HILTI epoxy adhesive.

h. (Closed) VIO 70-3098/2012-003-001, Failure to Meet MPQAP Storage Requirements for QL-1 Piping

(1) Scope and Observations

During the third quarter of 2012, the NRC issued a violation for failure to ensure that storage and handling of QL-1 piping was conducted in accordance with established work and inspection procedures or other specified documents. As a response to this violation, MOX Services issued CR-12-371, Construction Staging Area and CR-12-401, Improper Storage of Construction Materials. The inspectors reviewed the CRs to determine if the corrective actions to correct the violation were adequate. The corrective actions included: (1) weekly checks by laborers for weed control/growth, (2) installation of new pipe storage racks, (3) construction of a new pipe storage area, (4) storage requirements briefings/training, (5) conduct periodic walkdowns, (6) issuance of a new procedure 10-37 for control of issued QL-1/2 material, (7) construction of new laydown areas, and (8) new water mitigation plan for lower levels of BAP/BMP.

The applicant also performed a RCA-12-002 as a result of this violation. The inspectors reviewed the RCA and concurred with the overall conclusion including proper identification of root causes, contributing causes, and recommended corrective actions.

The inspectors conducted walkdowns of pipe storage areas and confirmed that the piping is being stored in accordance with MPQAP requirements.

The following CRs were included in the roll-up to the RCA: CR-12-371, CR-12-401, CR-12-436, CR-12-481, CR-12-483, CR-12-484, and CR-12-511.

(2) Conclusions

VIO 70-3098/2012-003-001, Failure to Meet MPQAP Storage Requirements for QL-1 Piping, is closed based on a review of the associated documentation and corrective actions.

6. Exit Interviews

The inspection scope and results were summarized throughout this reporting period and by the Senior Resident Inspector at an exit meeting with applicant senior management on April 16, 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
F. Cater, Deputy Civil Structural/Equipment
R. Eble, Nuclear Criticality Supervisor
D. Kehoe, Special Projects Manager
E. Radford, Regulatory Compliance
M. Gober, Vice President, Engineering
D. Gwyn, Licensing/Nuclear Safety Manager
D. Ivey, Quality Assurance Manager
J. Keklak, Quality Assurance Manager
S. King, Vice President, Project Assurance (Acting)
C. Murray, Engineer, Welded Equipment & Piping Group
A. Olorunniwo, Civil/Structural Manager
J. Peregoy, Quality Control Manager

2. INSPECTION PROCEDURES (IPs) USED

IP 88106	Program Development and Implementation
IP 88107	Design and Document Control
IP 88108	Control of Materials, Equipment, and Services
IP 88110	Quality Assurance: Problem Identification, Resolution, and Corrective Action)
IP 88130	Resident Inspection Program For On-Site Construction Activities at the Mixed-Oxide Fuel Fabrication Facility
IP 88131	Geo/Technical Activities
IP 88132	Structural Concrete Activities
IP 88133	Structural Steel and Support Activities
IP 88134	Piping Systems Relied on For Safety
IP 88135	Pipe Supports and Restraints
IP 88136	Mechanical Components
IP 88139	Ventilation and Confinement Systems
IP 55050	Nuclear Welding General Inspection Procedure

3. LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Item Number	Status	Description
70-3098/2015-01-01	Opened/Closed	NCV: Failure to Meet Base Metal Cleanliness Requirements on Embed Plates Prior to Commencement of Welding (Section 3.a)
70-3098/2015-01-02	Opened/Closed	NCV: Failure to Maintain Cleanliness Control Barriers and Establish Access Controls on BAP Process Piping (Section 3.c)
70-3098/2015-01-03	Opened/Closed	NCV: Failure to Adequately Control Nonconforming Glovebox Embed Components (Section 3.d)
70-3098/2010-03-09	Closed	URI: Failure to Provide a Compaction Plan as Required by NQA-1 (Section 5.a)
70-3098/2011-01-01	Closed	VIO: Failure to Ensure that QL-1 Equipment and Services Were Controlled to Assure Conformance with Specified Technical and QA Requirements (5 Examples) (Section 5.b)
70-3098/2011-03-01	Closed	VIO: Inadequate Work Package Qualitative/ Quantitative Acceptance Criteria (3 Examples) (Section 5.c)
70-3098/2012-01-01	Closed	VIO: Five Examples for Failure to Provide Work Documents Appropriate to the Nature and Circumstances of the Work Being Performed and to Perform Quality-Affecting Work Activities in accordance with Approved Implementing Documents (Section 5.d)
70-3098/2012-01-02	Closed	VIO: Two Examples of Failure to Identify Adequate Critical Characteristics (Section 5.e)
70-3098/2012-01-03	Closed	VIO: Two Examples of Failure to Identify and Correct Significant Conditions Adverse to Quality (Section 5.f)
70-3098/2012-02-03	Closed	IFI: Review of Applicant's Resolution of the Improperly Epoxied Rebar Installations (Section 5.g)
70-3098/2012-03-01	Closed	VIO: Failure to Meet MPQAP Storage Requirements for QL-1 Piping (Section 5.h)

4. LIST OF ACRONYMS USED

ACI	American Concrete Institute
ASME	American Society of Mechanical Engineers
AWS	American Welding Society
BAP	Aqueous Polishing Building
BMF	Fuel Manufacturing Building
BMP	MOX Process Building
CAR	Construction Authorization Request
CB&I	Chicago Bridge and Iron
CGIE	Commercial Grade Item Evaluation
CIB2	Construction Inspection Branch 2
CPB1	Construction Projects Branch 1
CR	Condition Report
D/C	Design Capacity
DCI	Division of Construction Inspection
DCP	Division of Construction Projects
DFFI	Division of Fuel Facility Inspection
ECR	Engineering Change Request
FCR	Field Change Request
FTS	Fluid Transport System
IFI	Inspection Follow-Up Item
IGC	Intergranular Corrosion
IMC	Inspection Manual Chapter
IP	Inspection Procedure
IR	Inspection Report
IROFS	Items Relied on for Safety
ITL	Independent Testing Lab
KCD	Oxalic Mother Liquors Recovery
LA	License Application
MFFF	MOX Fuel Fabrication Facility
MOX	Mixed Oxide
MOX Services	CB&I AREVA MOX Services
MPQAP	MOX Project Quality Assurance Plan
NCR	Non-conformance Report
NCV	Non-cited Violation
No.	Number
NQA-1	Nuclear Quality Assurance Requirements for Nuclear Facilities Applications
NRC	Nuclear Regulatory Commission
NTM	Jar Storage and Handling Unit
PAF	Process Assembly Facility
PP	Project Procedure
PRE	Grinding
PSJ	Ground and Sorted 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)
RCA	Root Cause Analysis
RII	Region II
Rev.	Revision
SB	Safety Branch
SDR	Supplier Deficiency Report
SL	Severity Level
SCWE	Safety Conscious Work Environment
SSC	System, Structure, or Component
SQAP	Shaw AREVA MOX Services QA Program
TCO	Temporary Construction Opening
™	Trademark
TTML	Tensile Testing Metallurgical Lab
URI	Unresolved Item
VIO	Violation
WP	Work Package

5. LIST OF PSSCs REVIEWED

PSSC-009	Criticality Controls
PSSC-021	Fire Barriers
PSSC-023	Fluid Transport Systems
PSSC-024	Gloveboxes
PSSC-036	MFFF Building Structure
PSSC-053	Waste Transfer Line

6. RECORDS AND DOCUMENTS REVIEWED

Project Procedures

PP 1-7, MOX Fuel Fabrication Lessons Learned Program, Rev. 3
PP 3-1, Employee Concerns Program, Rev. 8
PP 3-2, Trend Analysis, Rev. 3
PP 3-5, Control of Nonconforming Items, Rev. 9
PP 3-5, Control of Nonconforming Items, Rev. 10
PP 3-6, Corrective Action Process, Rev. 15
PP 3-6-6R15 ICN01, Corrective Action Process
PP 3-6-6R15 ICN02, Corrective Action Process
PP 3-6-6R15 ICN03, Corrective Action Process
PP 3-11, Assessments, Rev. 8
PP 3-14, Process and Product Sampling, Rev. 1
PP 3-25, Root Cause Analysis, Rev. 4
PP 3-28, Quality Control Receiving Inspection, Rev. 3
PP 3-30, Quality Inspection Plans & Inspection Reports, Rev. 2
PP 9-9, Engineering Specifications, Effective, Rev. 15
PP 9-39, Verification of Subcritical Dimensions for Criticality Safety, Effective, Rev. 3
PP 10-14, Supplier/Subcontractor Technical Document Submittal Management, Effective Document, Rev. 10
PP 10-14R10 ICN01, dated 2/24/2015
PP 11-44, Work Package Planning, Development, Approval and Closure, Rev. 12

PP 11-51, AWS D1.1 and D1.6 General Welding Procedure
PP 11-87, Control and Use of Work Instructions, Rev. 1
PP 11-88, Work Package Closure, Rev. 1

Condition Reports

1088-MOX-CR-15-057, NTM Stainless Steel Headed Studs with Cracks or Bursts
1088-MOX-CR-15-066 Zap Screwlock Manufacturer's Installation Instructions
1088-MOX-CR-15-003, Welds Omitted on Weld Map
1088-MOX-CR-14-338, Improper Welding Technique
1088-MOX-CR-14-314, Weld boxing requirements
1088-MOX-CR-14-376, NTM Vendor Seal Welds not Specifically Called Out

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10888-MOX-CR-11-274	10888-MOX-CR-12-060
10888-MOX-CR-11-665	10888-MOX-CR-10-180
10888-MOX-CR-11-569	10888-MOX-CR-11-665
10888-MOX-CR-12-011	10888-MOX-CR-12-013
10888-MOX-CR-09-399	10888-MOX-CR-10-513
10888-MOX-CR-12-183	10888-MOX-CR-10-512
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NCR-QC-14-5833, Evidence of Concrete in the Weld Area of Frame Leg FW005
NCR-QC-15-6079, NTM Indeterminate Studs
NCR-QC-15-6082, NTM Indeterminate Studs
NCR-QC-15-5988, Linear Indication on Nelson Stud
NCR-QC-15-6093, Missing Zaplock™ Manufacturer's Instructions

NCR QC 11-3134	NCR QC 11-3037
NCR QC 11-2953	NCR QC 11-2918

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ECR 016649, TCO Closure BMP, Level 1, Room B-129 Wall Line 5.3 (S-T)
ECR 021239, Closure of Two Penetrations in BMP B210
ECR 22953, Wall Dowels for NTM Project Glovebox Openings M & N Lines, Col. 3 to 7 EL. 0' -0
ECR 23100, Rebar Details for Closure of TCO's on M and N Line Walls, Col Lines 3 to 7, EL 0'- 0
ECR 021292, Closure of Two Penetrations in T-Line between 4 and 5 walls in BMP B211
ECR-025394, Vendor Seal Welds are not Specifically Called Out on Drawings per AWS Requirements
ECR 012120 Weld Symbol Clarifications
FCR 004107, Increased Weld Sizes
FCR 004327, Construction Aid for NTM Link Module Embed Weldment

ECR 017072	ECR 008741	ECR 005683
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Miscellaneous Documents

MOX Project Quality Assurance Plan, current revision
Quality Control Inspection Plan S501
Weld Technique Sheet D9.1-GT-SS-01
Inspection Report S561-15-0242
Weld Record 1304474, Weld No C234-PS-03300-FW0040-C0R0
Weld Record 1500281, Weld No. 14-C145-DRIP-2079-FW018-C0R0
SDEF- KPA*TK9000 Rev. 2
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SDEF- KPA*TK9500 Rev. 2
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SDEF- KPA*TK5300 Rev. 2
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SQAP-029, Status of the Shaw/AREVA MOX Services, LLC Quality Assurance Program, 6/21/2011

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DCS01-KCC-AG-WPK-M-50089, KCC 1000, 2000 Mechanical Penetrations
DCS01-KCB-AG-WPK-M-01836-T04, KCB-2000 Re-Assembly
DCS01-KCC-AG-WPK-M-01741, Assemble KCC*GB1000 Glovebox
DCS01-ZMJ-MG-PLE-M-70021
DCS01-BMF-DS-PLF-A-04509-3, MOX Fuel Fabrication Facility ABC Construction of Typical Fire Damper Penetration Details
DCS01-ZMJ-DS-SPE-M-19107-7, Process Equipment Welding Requirements
DCS01-ZMS-DS-SPE-M-15145-5, Field Fabrication and Installation of Pipe and Electrical Raceway Supports
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DCS01-ZMJ-DS-NTE-M-60098-3, Process Equipment Welding Analysis Procedure

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DCS01 KPA CG CAL H 06973 0, Criticality Safety of the Tanks in Cell C-141 of Unit KPA Quality Level 1a – IROFS, dated 5/22/2007
DCS01-WRT-DS-SPE-B-09307-3, Section 02316 – Excavation, Backfilling, and Compaction

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DCS01-NPG-DS-CGD-M-65900, Commercial Grade Item Evaluation for Lodige Power Mixer
DCS01-ZMJ-DS-NTE-M-61502, Basis for Intergranular Corrosion Testing of Fluid Transfer System (FTS) Materials and Components, Rev. 0
DCS01-ZMJ-DS-CGD-M-65964, Commercial Grade Item Evaluation of S30403 (304L), S31008 (310S), S31603(316L), Incoloy 800H, Titanium Grade 2, Carbon Steel and Zirconium R60702 Metallic Standard forms Used in Fluid Transport System Applications, Rev. 5
DCS01-XGA-DS-CAL-B-01109, Cumulative Effect of BMF Concrete Structural Issue on Original ANSYS Analysis, Rev. 2
DCS01-BKA-DS-SPE-B-09330, Construction Specification Section 03301 Placing Concrete and Reinforcing Steel for Quality Level 1, 2, 3, and 4
Tanks Shaw/AREYA MOX Services Commercial Grade Item Evaluation Report of Tensile Testing Metallurgical Laboratory (TTML-12-VS185)

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10-CP27-KCD-TK4100-M, Installation of KCD-TK4100 in Room C-134
QORE Field Density Report #43247, 10/26/2009

14-KPS-TEST-P-M-0001-1657, Leak Test KPS System for BAP
Work Packets
KPS-TEST-P0001
KPS-TEST-P0002
KPS-TEST-P0015
KPS-TEST-P0018
KPS-TEST-P0032

14-C234-ZMS-S-M-1006-15S-1649, Install Pipe Supports in BAP Room C-234
Work Packets
C234-PS-18306-SH503
C234-PS-28306-SH660

14-C234-ZMS-S-M-1007-15S-1650, Install Pipe Supports in BAP Room C-234
Work Packet
C234-PS-48919

14-C234-ZMS-S-M-0005-13S-1544, Install Pipe Supports in BAP Room C-234
Work Packets
C234-PS-32067-SH427
C234-PS-00696

14-B173-SDK-GB-M-1446, Installation of SDK Process Equipment
Work Packet
SDK-CRN7000

12-CP24-B129-PSF-GB1000-2000-M-0003, Installation of Shielding

14-CP24-NTM-PE-M-1357, Installation of NTM Process Equipment
Work Packet
14-CP24-NTM-PE-M-1357-P002

14-B123-NTM-PLAT-SHLD-M-1739, Installation of NTM Main Tunnel Platform and Shielding
Work Packet
14-B123-NTM-PLAT-SHLD-M-1739-T02

14-B250-HSA-0001-V-2154, In-Wall Fire Barrier Installation for B-250
Work Packet
HAS*DMPF0250B

14-C234-ZMS-S-M-0005-13S-1392, Install Pipe Supports in BAP Room C-234
Work Packet
C234-PS-05651-SH530
C234-PS-15714-SH431
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14-B134-B135-ZMS-WW-S-E-1906, Installation of Wire Way Supports in Rooms B-134, B-135
Work Packet
B134-WW-00009

14-C313-ZMS-CT-S-E-1462, Installation of Design Routed Cable Tray Supports
Work Packet
C313-CT-00045

14-C126-EEJ-WW-E-2228, Installation of Wire Way
Work Packet
WWXN126C01

14-KCD-TEST-P-M-0002, Leak Test KCD System for BAP
Work Packet
KCD-TEST-P0021 (DCS01-PML-AG-WPK-M-01127, Pellet Handling Unit Assembly of Internals)

14-CP20-B123-TCO-CON-C-1448
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