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

May 9, 2013

Mr. Kelly D. Trice
President and Chief Operating Officer
Shaw AREVA MOX Services
Savannah River Site
P.O. Box 7097
Aiken, SC 29804-7097

SUBJECT: MIXED OXIDE FUEL FABRICATION FACILITY- NRC INSPECTION REPORT NO. 70-3098/2013-001

Dear Mr. Trice:

During the period from January 1 through March 31, 2013, 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 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 this inspection, the enclosed report documents NRC-identified 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. If you contest the NCVs in the enclosed report, 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. 70-3098/2013-001
w/attachment: Supplemental Information

cc w/encl: (See next page)

cc w/encl:
Mr. Scott Cannon, Federal Project Director
NA-262.1
P.O. Box A
Aiken, SC 29802

Mr. Sam Glenn, Deputy
Federal Project Director
NA-262.1
P.O. Box A
Aiken, SC 29802

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

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

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

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

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

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

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

Mr. Dealis Gwyn, Licensing Manager
Shaw AREVA MOX Services
Savannah River Site
P.O. Box 7097
Aiken, SC 29804-7097

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SIGNATURE	WBG	MXS1 via e-mail	BJA1 via e-mail				
NAME	W. Gloersen	M. Shannon	B. Adkins				
DATE	5/09/2013	5/09/2013	5/09/2013				
E-MAIL COPY?	YES	YES	YES				

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Letter to Kelly Trice from Deborah Seymour dated May 9, 2013.

SUBJECT: MIXED OXIDE FUEL FABRICATION FACILITY- NRC INSPECTION REPORT NO. 70-3098/2013-001

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U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.:	70-3098
Construction Authorization No.:	CAMOX-001
Report No.:	70-3098/2013-001
Applicant:	Shaw AREVA MOX Services
Location:	Savannah River Site Aiken, South Carolina
Inspection Dates:	January 1 – March 31, 2013
Inspectors:	M. Shannon, Senior Resident Inspector, Construction Projects Branch (CPB) 1, Division of Construction Projects (DCP), Region II (RII) B. Adkins, Resident Inspector, CPB1, DCP, RII A. Artayet, Senior Construction Inspector, Construction Inspection Branch (CIB) 3, Division of Construction Inspection (DCI), RII S. Smith, Senior Construction Inspector, CIB2, DCI, RII
Accompanying Personnel:	D. Seymour, Branch Chief, CPB1, DCP, RII W. Gloersen, Senior Construction Project Inspector, CPB1, DCP, RII
Approved by:	D. Seymour, Branch Chief, CPB1, DCP, RII

Enclosure

EXECUTIVE SUMMARY

Shaw AREVA MOX Services (MOX Services)
Mixed Oxide (MOX) Fuel Fabrication Facility (MFFF)
NRC Inspection Report Number (No.) 70-3098/2013-001

The scope of the inspections encompassed a review of various MFFF activities related to Quality Level (QL)-1 construction for conformance to 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: design control; special processes; quality assurance interfaces; installation; fabrication; and control of materials, equipment, and services.

The principle systems, structures and components (PSSCs) discussed in this inspection report included: PSSC-006, C4 Confinement System; PSSC-009, Criticality Control; PSSC-021, Fire Barriers; PSSC-023, Fluid Transport Systems; PSSC-024, Gloveboxes; PSSC-032, Material Handling Equipment; and PSSC-036, MFFF Building Structure (including the vent stack); and PSSC-053, Waste Transfer Line.

Routine Resident Inspections

The inspectors routinely attended the applicant's construction plan-of-the-day meetings, reviewed the status of work packages maintained at various work sites, verified that changing weather conditions were taken into account for planned construction activities, 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-006, C4 Confinement System

The inspectors observed construction activities related to PSSC-006 as described in Table 5.6-1 of the MFFF CAR. The inspection attribute observed was special processes. The associated items relied on for safety (IROFS) components were valve VHD*V1445 and pipe spool VHD-DS-PLI-T-8201001-10-FW002-C0R0. A total of two inspection samples were observed.

- Sample 1: The inspectors verified that welding and non-destructive examination (NDE) was performed in accordance with American Society of Mechanical Engineers (ASME) code requirements and MOX specifications. Non-cited Violation (NCV) 70-3098/2013-001-001 was identified for failure to follow project procedures that assure that only correct and accepted material, parts, and components were used or installed. (Section 3.a(1))

- Sample 2: The inspectors reviewed applicable documentation and interviewed personnel and determined that MOX Services adequately implemented applicable ASME code requirements regarding the performance of random radiography and progressive sampling. No findings of significance were identified. (Section 3.a(2))

PSSC-009, Criticality Control

The inspectors observed construction activities related to PSSC-009 as described in Table 5.6-1 of the MFFF CAR. The associated IROFS components were the rod storage racks (STK) and the Room C-234 drip tray. Two inspection attributes were observed.

- An inspection attribute observed was design control. Example 1 of NCV 70-3098/2013-001-002 was identified for failure to ensure that design changes were reviewed by affected organizations. Failure to follow this requirement resulted in the improper installation of single-walled process piping into a moderator controlled room. (Section 3.b(1))

- An inspection attribute observed was control of materials, equipment, and services. The inspectors determined that MOX Services adequately implemented the nonconformance reporting program as outlined in MPQAP, Section 15, Nonconforming Parts, Materials, or Components. No findings of significance were identified. (Section 3.b(2))

PSSC-023, Fluid Transport Systems

The inspectors reviewed welding and NDE activities associated with PSSC-023 as described in Table 5.6-1 of the MFFF CAR.

- The inspection attribute observed was special processes. The associated IROFS component was field weld KPA-DS-PLI-T-0603500-01- FW002-C0R0 in Room C-110 of the aqueous polishing building (BAP). The inspectors reviewed welder qualification records, weld procedure qualification records, weld procedure specifications, weld data sheets, computerized radiography images, and certified material test reports for weld filler metal and base metals. The inspectors concluded that MOX Services performed the welding and NDE activities in accordance with the applicable code and quality assurance requirements. No findings of significance were identified. (Section 3.c(1))

- The inspection attribute observed was special processes. The associated IROFS components were field welds KPA-DS-PLI-T-0633701-06-FW002-C0R0 and KCD-DS-PLI-T-5452200-01-FW003-C0R0. The inspectors reviewed applicable documentation and interviewed personnel to determine if MOX Services adequately implemented applicable ASME code requirements regarding the performance of random radiography and progressive sampling. No findings of significance were identified. (Section 3.c(2))

- The inspection attribute observed was special processes. The associated IROFS component was pipe spool C151-KWD-DS-PLI-T-5342101. The inspectors verified that field bending of piping was performed in accordance with ASME code and project procedure requirements. No findings of significance were identified. (Section 3.c(3))

- The inspection attribute observed was installation. The associated IROFS component was tank KPA*TK5300. Specifically, the inspectors performed a detailed review of the recently closed work package for chemical processing tank KPA*TK 5300. The detailed inspection activities identified one violation associated with work package (WP) 09-1088-C1935-AP-KPA-TK5300-M. NCV 70-3098/2013-001-003 was identified for inappropriate

acceptance criteria in work package results in incorrect inspection requirements for torquing of tank fasteners. (Section 3.c(4))

- The inspection attribute observed was control of materials, equipment, and services. The associated IROFS component was KPA*TK8500. The inspectors performed a walk down of BAP process tanks to determine if MOX Services was adequately implementing Quality Assurance Requirements for Nuclear Facilities Applications (NQA-1-1994 Edition) requirements for cleanliness and foreign material exclusion. NCV 70-3098/2013-001-004 was identified for failure to ensure that items in storage shall have covers, caps, plugs, or other closures intact. (Section 3.c(5))

PSSC-024, Gloveboxes

The inspectors observed construction activities related to PSSC-024 as described in Table 5.6-1 of the MFFF CAR.

- The inspection attribute observed was special processes. The associated IROFS component was KDA*GB7000. The inspectors reviewed welder qualification records, weld procedure qualification records, weld procedure specifications, weld data sheets, computerized radiography images, and certified material test reports for weld filler metal and base metals for compliance with applicable code requirements. No findings of significance were identified. (Section 3.d(1))

- The inspection attribute observed was quality assurance interfaces. The associated IROFS component was PSI*GB1000. The inspectors reviewed the Nuclear Criticality Safety Evaluation- Design (NCSE-D), criticality calculation, glovebox design drawings, structural calculation, criticality safety dimensional reports, and engineering change requests to determine if MOX Services adequately controlled safety function interfaces between the ISA and design engineering groups. No findings of significance were identified. (Section 3.d(2))

PSSC-032, Material Handling Equipment

The inspectors observed construction activities related to PSSC-032 as described in Table 5.6-1 of the MFFF CAR. The inspection attribute observed was control of materials, equipment, and services. The associated IROFS component was the Homogenization and Pelletizing Unit (NPG) jar tilter hydraulic damper (NPG*DMP2001). The inspectors reviewed completed commercial grade dedication documentation, vendor test reports, positive material identification results, and engineering change requests (ECRs). The inspectors concluded that MOX Services adequately implemented its commercial grade dedication program as described in MPQAP, Section 7, Control of Purchased Material, Equipment, and Services. No findings of significance were identified. (Section 3.e)

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

The inspectors observed that construction activities related to PSSC-036, as described in Table 5.6-1 of the MFFF CAR, were adequately performed and included installations of reinforcing steel, embedded plates and ground cables; concrete placements; operation of the batch plant; heavy lifts of equipment and supplies; verification of equipment placements by surveys; reinforcing bar (rebar) installation; placement of concrete; and receipt of materials. These

construction activities were performed in a safe and quality related manner and in accordance with procedures and WPs. No findings of significance were identified. (Section 3.f)

Follow-up of Previously Identified Items

The inspectors reviewed and evaluated MOX Services corrective actions related to previously opened items. Based on the review of the associated documentation and the implemented corrective actions, Violation (VIO) 70-3098/2010-001-003 and VIO 70-3098/2010-002-002 were closed. (Sections 4.a and 4.b)

Unresolved Item (URI) 70-3098/2012-002-002, Review of Pellet Handling Fire Door Commercial Grade Dedication Documentation and Material Test Reports, was closed and Example 2 of NCV 70-3098/2013-001-002, Failure to Ensure that Design Changes Were Reviewed by Affected Organizations, was identified for failure to ensure that a criticality-related IROFS design change was properly reviewed by Nuclear Safety as required by PP 9-3, Design Control. (Section 4.c)

REPORT DETAILS

1. Summary of Facility Status

During the period, the applicant (Shaw AREVA MOX Services (MOX Services)) continued construction activities of principle systems, structures and components (PSSCs). Construction activities continued related to Release 3A and 3B activities which included multiple inside and outside walls, elevated floors, and roof sections of the Mixed Oxide (MOX) Fuel Fabrication Facility (MFFF) Manufacturing Building (BMP), Aqueous Polishing Building (BAP), and the Shipping Receiving Building (BSR). The applicant continued with the application of coatings on the walls and ceilings of the BMP and BAP upper level rooms and hallways. Other construction activities included installation of process piping and supports in the BAP and BMP, installation of ventilation system ductwork and supports in the BAP, BSR, and BMP, installation of cable trays and cable tray supports in the BAP and BMP, installation of conduit in the BAP, BMP, and BSR, installation of fire doors and dampers in the BAP and BMP, and installation of gloveboxes in the 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, Resident Inspection Program for On-Site Construction Activities at the Mixed Oxide Fuel Fabrication Facility; and IP 88110, Quality Assurance: Problem Identification, Resolution, and Corrective Action)

a. Scope and Observations

The inspectors routinely attended the applicant's construction plan-of-the-day meetings and civil engineering meetings. The inspectors routinely held discussions with MOX Services design engineers, field engineers, quality assurance (QA) and quality control (QC) personnel, batch plant personnel, steel workers, and subcontractors (Alberici, Superior, Electric Boat, and Soils and Materials Engineering, Inc. (S&ME)) 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 routinely verified that changing weather conditions were taken into account for planned construction activities and construction activities were conducted in a safe manner. The inspectors also observed proper communication in the work areas, observed that the work force was attentive, workers adhered to procedures, observed proper communication between supervisors and workers, and noted that hazardous materials were properly stored and/or properly controlled when in the field. 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), condition reports (CRs), root causes, and supplier deficiency reports (SDRs). 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 MFFF work areas to verify that MOX Services' staging and installation of piping, ductwork, and equipment met regulatory commitments and procedural requirements.

b. Conclusions

The inspectors routinely attended the applicant's construction plan-of-the-day meetings, reviewed the status of WPs maintained at various work sites, verified that changing weather conditions were taken into account for planned construction activities, 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.

3. PSSC Related Inspections

a. PSSC-006, C4 Confinement System

(1) Attribute: Special Processes (IP 88134, Quality Assurance: Piping Relied on for Safety; IP 55050, Nuclear Welding General Inspection Procedure; IP 88136, Mechanical Components; IP 88143, Pipe Supports and Restraints) – Sample 1

(a) Scope and Observations

The inspectors reviewed weld records for the fabrication and installation of Very High Depressurization (VHD) system piping to verify that welding and subsequent inspections were performed in accordance with the regulatory requirements of the 2006 Edition for the American Society of Mechanical Engineers (ASME) B31.3, Process Piping, and MOX Project Quality Assurance Plan (MPQAP), Revision 10, Change 1.

The inspectors reviewed two MOX Services Weld Data Sheets for field welds VHD-DS-PLI-T-8214125-03-FW-001 and -002 from work package 11-CP27-B146-VHD-P-M-0001 to determine whether inspections were performed and accepted by QC for cleanliness, fit-up, purge gas, purge dam installation and removal, and final non-destructive examination (NDE) including visual testing (VT), liquid penetrant testing (PT), and radiography testing (RT) in accordance with the MPQAP. The field welds were associated with the installation of a two inch diameter stainless steel ball valve VHD*V1445 with inlet and outlet flanged pipe nipples. The inspectors verified that NDE, VT, PT, and RT were performed in accordance with the MPQAP requirements

The inspectors reviewed a Weldstar certified material test report (CMTR) for heat CT8816 (UTC 9776) for an Arcos ER308/308L classification solid welding rod of 3/32 inch diameter and 36 inch length and determined that the chemical and mechanical properties were in accordance with ASME Section II, Part C, SFA-5.9, Specification for Bare Stainless Steel Welding Electrodes and Rods, with traceability from the MOX Services Weld Material Requisition and Weld Data Sheets.

The inspectors reviewed MOX Services Welding Technique Sheet (WTS), B31.3-GTAC-8-8-01, Revision 1, and determined that the automatic welding procedure with

supporting Procedure Qualification Record (PQR)-Number (No.) B31.3-GTAC-8-8-2-40 (for two inch diameter schedule 40 pipe) and Automatic Parameter Sheet along with the use of a flux catalyst (to assist with penetration) were in accordance with the requirements of ASME Section IX.

The inspectors reviewed the welder and welding operator qualifications with unique identifier P078 and determined that the individual was tested and certified in accordance with ASME Section IX.

The inspectors reviewed United Research Services (URS) NDE-1, Training, Examination & Certification of Nondestructive Examination Personnel, Revision 21, and determined that the written practice was in accordance with the requirements of the American Society of Nondestructive Testing (ASNT) SNT-TC-1A, Recommended Practice for Personnel Qualification and Certification in Nondestructive Testing.

The inspectors reviewed current URS NDE Certifications Records for QC inspectors 72435 and 15529 and determined that qualifications, training, examination results, and experience were in accordance with the URS written practice and SNT-TC-1A. The inspectors reviewed URS Visual Acuity Examination Records for both QC inspectors 72435 and 15529 and determined that field weld inspections were performed before the eye test expiration dates in accordance with ASME B31.3, Process Piping, and URS written practice.

The inspectors reviewed URS Liquid Penetrant Report, PT-MOX-0455, and determined that the technique, method, and acceptance criteria for liquid dye penetrant examination were in accordance with the requirements of ASME Section V, Nondestructive Examination, Article 6, Liquid Penetrant Examination, and ASME B31.3.

The inspectors reviewed URS QC Procedure, M-NDE-003, Computed Radiography, Revision 4, and determined that the personnel qualifications, technique, and acceptance criteria were in accordance with the requirements of the 2010 Edition of ASME Section V, Article 2, Radiographic Examination, and B31.3, Process Piping.

The inspectors reviewed URS Computed Radiography Reports and RT films CR-MOX-0228 and -0229, and determined that the technique, method, and acceptance criteria for field welds FW-001 and -002, respectively, were in accordance with the requirements of ASME Section V, Article 2, and B31.3, Process Piping.

The inspectors reviewed a CMTR for heat 41679 (Unique Traceable Commodity (UTC) 47761) for two inch diameter schedule 40 seamless piping welded to the inlet and outlet ends of ball valve V1445 and determined that the chemical and mechanical properties were in accordance with material specification and grade, and as indicated on the Bill of Materials (BOM) of BF Shaw fabricator isometric sketch 008754-40-04779 and MOX Services isometric drawing DCS01-VHD-DS-PLI-T-8214125, Sheet 3, Revision 2.

The inspectors reviewed work package 11-CP27-B146-VHD-P-M-0001 to determine if MOX Services could provide material traceability documentation for Quality Level (QL)-1 valve VHD*V1445. The inspectors requested MOX Services to provide a CMTR for the valve in order to verify that the chemical and mechanical properties were in accordance with MOX Services' material specifications. Subsequently, MOX Services informed the inspectors that a CMTR was not available for review because the installed valve was

determined to be QL-4 (commercial) instead of QL-1 as shown on the design drawing. Based on information provided by MOX Services, the inspectors determined that MOX Services installed a QL-4 valve into a QL-1 system.

The inspectors reviewed Project Procedure (PP) 10-37, Control of QL-1 and QL-2 Issued Material, to determine the requirements for the control and issuance of QL-1and QL-2 material to the field. The inspectors noted that the procedure permits the transfer of QL-1 and QL-2 material from one work implementing document (e.g., work package) to another work implementing document when approved by the field engineer (FE) or subcontract technical representative (STR); however, the procedure does not permit material transfer from a QL-4 (non-safety-related) work package to a QL-1 or QL-2 work package. The inspectors reviewed the material issue ticket contained in QL-1 work package 11-CP27-B146-VHD-P-M-0001 and concluded that the valve was issued to a QL-4 work package (12-CP27-B267-CHH-P-M-0001) associated with the chilled water (CHH) system instead of the QL-1 work package that installed the VHD system valve. The inspectors concluded that the QL-1 valve was improperly transferred from a QL-4 work package to a QL-1 work package.

The inspectors noted that MOX Services had not completed the final QC inspection of the valve; however, the inspectors concluded that MOX Services had at least two opportunities to identify and correct the issue prior to discovery by the NRC. The first was associated with a QC inspection of the welds that connected the valve to the adjacent piping. The second was the required sign-off by field engineer/STR when the material was transferred from the QL-4 work package to the QL-1 work package. The inspectors noted that MOX Services did not complete the required form (Form PP 10-37A) to document the material transfer between the work packages. The inspectors noted that the form clearly prohibits transfer of material from a QL-4 implementing document to a QL-1 implementing document.

MPQAP, Section 8, Identification and Control of Material, Parts, and Components, Section 8.1, General, states, in part, the MOX Services QA Program procedures establish the necessary controls to assure that only correct and accepted material, parts and components including the use of consumables and items with limited shelf life and partially fabricated assemblies are used or installed.

MOX Services PP 10-37, Control of QL-1 and QL-2 Issued Material, Form PP 10-37A, precludes material transfer from a QL-4 implementing document into a QL-1 or QL-2 implementing document.

Contrary to this requirement, the inspectors concluded that MOX Services failed to follow PP 10-37 and failed to assure that only correct and accepted material, parts, and components were used or installed. Specifically, MOX Services improperly transferred QL-4 material from a QL-4 work document into a QL-1 or QL-2 work document. 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-13-064), this violation is being treated as a non-cited violation (NCV), consistent with Section 2.3.2 of the NRC Enforcement Policy: NCV 70-3098/2013-001-001, Failure to Follow Project Procedures that Assure that Only Correct and Accepted Material, Parts, and Components Are Used or Installed. The inspectors determined that this finding was more than minor because it represented an inadequate process and quality oversight

function that, if left uncorrected, could adversely affect the quality of the fabrication and construction of safety-related components. Specifically, the finding involved a deficiency in construction which requires substantial rework or repair to establish the adequacy of the system, structure, or component (SSC) to perform its intended safety function. The finding is a SL IV because it did not involve multiple examples of deficient construction related to the QA breakdown of a single work activity.

(b) Conclusions

The inspectors observed construction activities related to PSSC-006, C4 Confinement System, as described in Table 5.6-1 of the MFFF Construction Authorization Request (CAR). The inspection attribute observed was special processes and the associated IROFS component was valve VHD*V1445. The inspectors verified that welding and NDE were performed in accordance with ASME code requirements and MOX Services specifications. NCV 70-3098/2013-001-001 was identified for failure to follow project procedures that assure that only correct and accepted material, parts, and components were used or installed.

(2) Attribute: Special Processes (IP 88134, Quality Assurance: Piping Relied on for Safety; IP 55050, Nuclear Welding General Inspection Procedure; IP 88136, Mechanical Components; IP 88143, Pipe Supports and Restraints) – Sample 2

(a) Scope and Observations

The inspectors conducted interviews of personnel involved in the selection and tracking of welds selected for random radiography to determine if MOX Services adequately implemented the requirements of ASME B31.3, Chapter VI, Inspection, Examination, and Testing. The inspectors reviewed DCS01-ZMJ-DS-SPE-M-19107-6, Process Equipment Welding Requirements; and PP 11-61, Progressive Examination; to determine if MOX Services adequately flowed down applicable NDE code requirements, including specific requirements to perform random radiography and progressive sampling of welds, into MOX Services' project procedures. Based on their review, the inspectors determined that MOX Services placed visually accepted piping welds subject to progressive examination in specific lots by the construction welding engineer (CWE). The lots were organized by specific criteria such as the welder/welding operator, fluid transport system (FTS) category, welding process, and type and percentage of examination. The inspectors reviewed current open lot reports to verify that MOX Services was adequately implementing the requirements of PP 11-61. The inspectors selected the following welds that were rejected as a result of random radiography to determine if MOX Services adequately implemented progressive examination code requirements:

- VHD-DS-PLI-T-8201001-10-FW002-C0R0 (CRT-MOX-0415)

The inspectors verified that welds selected for random radiography were selected either by QC or CWE. The inspectors verified that lots are adequately opened and closed in accordance with MOX Services procedural requirements. The inspectors verified that MOX Services selected two additional welds from the lot associated with the rejected weld.

(b) Conclusions

The inspectors observed construction activities related to PSSC-006, C4 Confinement System. The inspection attribute observed was special processes and the associated IROFS component was VHD piping (VHD-DS-PLI-T-8201001-10-FW002-C0R0) installed in Room B-188 of the BMP. The inspectors reviewed applicable documentation and interviewed personnel and determined that MOX Services adequately implemented applicable ASME code requirements regarding the performance of random radiography and progressive sampling. No findings of significance were identified.

b. PSSC-009, Criticality Control

(1) Design Control Attribute (IP 88107, Design and Document Control)

(a) Scope and Observations

The inspectors selected the rod storage rack process unit (STK) as an inspection sample to determine if MOX Services adequately implemented the requirements of the STK Nuclear Criticality Safety Evaluation (NCSE-D). The inspectors noted that the NCSE-D credits moderation control as one of the controlled parameters in Table 7-1, Applicable Criticality Control and Limits on Parameters. Specifically, Table 7-1 stated that no single walled process piping of any kind exists inside the environs of Room B-186 that contains, or has the potential to contain, water equivalent moderator. During a walk down of Room B-186, the inspectors noted that MOX Services was installing single-walled liquid waste reception (KWD) system piping over the rod storage racks in Room B-186 of the BMP. Based on a review of the KWD system as described in the system description document (SDD), the inspectors concluded that the KWD piping has the potential to contain non-chemical liquid low level waste (LLLW) such as de-mineralized water from a floor drain in Room B-260 of the BMP. Based on the physical properties of the fluid as described in the SDD, the inspectors concluded that the fluid is a water equivalent moderator. The specific KWD line is shown on piping and instrument diagram (P&ID) DCS01-KWD-DS-PLI-T-5219400, Piping Isometric Liquid Waste Reception.

During a subsequent review of this issue, the inspectors determined that the criticality strategy for the STK unit changed from neutron absorber control to moderation control in the most recent revision (Revision 4) of the NCSE-D issued in December 2011. The inspectors reviewed the NCSE-D revision to determine if impacted groups such as engineering and construction provided interdisciplinary reviews of the change as required by PP 9-3, Design Control.

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

MPQAP, Section 3, Design Control, Section 3.1, General, states, in part, that QA procedures detail the controls for design input, design process, design verification, design changes and approval.

PP 9-3, Design Control, Section 3.12, Revisions, Subsection 7, states, in part, that changes shall be reviewed by the organizations or disciplines affected by the change as determined by the Responsible Manager (RM) or Lead Engineer (LE) responsible for the document revision.

Contrary to this requirement, the inspectors concluded that MOX Services failed to follow QA procedures that govern the design change control process. Specifically, MOX Services failed to ensure that design changes were reviewed by the organizations or disciplines affected by the change as required by Step 3.12.7 of PP 9-3. Failure to follow this requirement resulted in the improper installation of single-walled process piping into a moderator controlled room. 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 examples supporting the violation were entered into the applicant's corrective action program (CR-13-019), this violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy: Example 1 of NCV 70-3098/2013-001-002, Failure to Ensure that Design Changes Were Reviewed by Affected Organizations.

The inspectors determined that this finding was more than minor because it represented an inadequate process and quality oversight function that, if left uncorrected, could adversely affect the construction of safety-related components and the criticality safe operations in Room B-186. Specifically, the finding involved a deficiency in construction that will require one or more of the following to establish the adequacy of the SSC to perform their intended safety function: (1) a detailed engineering justification; (2) redesign; (3) replacement; (4) supplemental examination, inspection, or test; (5) substantial rework; or (6) repair. The finding is a SL IV because it did not involve multiple examples of deficient construction related to the QA breakdown of a single work activity.

(b) Conclusions

The inspectors observed construction activities related to PSSC-009, Criticality Control. The inspection attribute observed was design control and the associated IROFS component was STK. The inspectors conducted a walk down of Room B-186 to verify that moderator control requirements established in the NCSE-D were properly implemented. Example 1 of NCV 70-3098/2013-001-002 was identified for failure to ensure that design changes were reviewed by affected organizations.

(2) Control of Materials, Equipment, and Services Attribute (IP 88108, Control of Materials, Equipment, and Services)

(a) Scope and Observations

The inspectors reviewed the disposition and closeout of MOX Services NCR CE-12-4541 regarding consistent moisture of colemanite in the southeast corner of Room C-234. The colemanite is credited as a neutron absorber beneath the C-234 Drip Tray. The inspectors verified that the interim actions and interim dispositions were clearly identified and documented. The inspectors reviewed the completed interim actions including survey/sounding of the potentially voided areas, repair of one voided area, and required neutron testing of all potentially voided areas. The inspectors verified that the work was complete and inspected by QC personnel. The inspectors reviewed the final

"use as is" and "repair" dispositions and verified that design control measures were commensurate with those applied to the original design including design verification and approval by nuclear safety.

(b) Conclusions

The inspectors observed construction activities related to PSSC-009, Criticality Control. The inspection attribute observed was control of materials, equipment, and services and the associated IROFS component was the Room C-234 process cell drip tray. The inspectors determined that MOX Services adequately implemented the nonconformance reporting program as outlined in the MPQAP, Section 15, Nonconforming Parts, Materials, or Components. No findings of significance were identified.

c. PSSC-023 Fluid Transport Systems

(1) Attribute: Special Processes (IP 88134, Quality Assurance: Piping Relied on for Safety; IP 55050, Nuclear Welding General Inspection Procedure; IP 88136, Mechanical Components; IP 88143, Pipe Supports and Restraints) – Sample 1

(a) Scope and Observations

The inspectors observed welding of FTS Category 1 piping in Room C-110 of the BAP. Specifically, the inspectors selected field weld number KPA-DS-PLI-T-0603500-01-FW002-C0R0 as an inspection sample. The inspectors reviewed weld records and NDE reports to verify that welding and NDE were performed in accordance with ASME code requirements, specifically ASME Section IX, Welding and Brazing Qualifications, and ASME Section V, Non-Destructive Examination.

The inspectors reviewed WTS B31.3-GTAC-8-8-01, Revision 1, with supporting PQR and welder qualification test record for Identification (ID) Symbol PO24, to verify that the weld procedure and welder were qualified in accordance with the requirements of ASME Section IX. The inspectors verified that the welder used the correct filler metal for the tack weld as specified on the weld data sheet. The inspectors reviewed the CMTR for the weld filler metal to verify that the chemical properties met the requirements of ASME Welding Filler Materials (SFA) 5.9, Specification for Bare Stainless Steel Welding Electrodes and Rods. The inspectors reviewed the completed weld data sheet and weld metal requisition form contained in WP 11-CP27-C110-KPA-P-M-0001A to verify that the filler metal heat/lot number was traceable back to the CMTR. The inspectors reviewed the CMTRs and associated commercial grade dedication (CGD) documentation for the base metal piping to verify that the material met the required chemical and physical properties identified in the piping material specification. The inspectors verified that the work package documentation contained the necessary information to provide material traceability back to the CMTRs.

The inspectors reviewed the completed radiography reports and images for the selected weld for compliance with ASME Section V requirements. The inspectors verified that the NDE personnel that performed the radiography were qualified in accordance with ASME Section V and ASNT-TC-1a requirements.

(b) Conclusion

The inspectors reviewed welding and NDE activities associated with PSSC-023, Fluid Transport Systems, as described in Table 5.6-1 of the MFFF CAR. The inspection attribute observed was special processes and the associated IROFS component was field weld KPA-DS-PLI-T-0603500-01-FW002-C0R0 in Room C-110 of the BAP. The inspectors reviewed welder qualification records, weld procedure qualification records, weld procedure specifications, weld data sheets, computerized radiography images, and certified material test reports for weld filler metal and base metals. The inspectors concluded that MOX Services performed the welding and NDE activities in accordance with the applicable code and quality assurance requirements. No findings of significance were identified.

(2) Attribute: Special Processes (IP 88134, Quality Assurance: Piping Relied on for Safety; IP 55050, Nuclear Welding General Inspection Procedure; IP 88136, Mechanical Components; IP 88143, Pipe Supports and Restraints) – Sample 2

(a) Scope and Observations

The inspectors conducted interviews of personnel involved in the selection and tracking of welds selected for random radiography to determine if MOX Services adequately implemented the requirements of ASME B31.3, Chapter VI, Inspection, Examination, and Testing. The inspectors reviewed DCS01-ZMJ-DS-SPE-M-19107-6, Process Equipment Welding Requirements, and PP 11-61-0, Progressive Examination, to determine if MOX Services adequately flowed down applicable NDE code requirements, including specific requirements to perform random radiography and progressive sampling of welds, into MOX Services specifications and procedures. Based on their review, the inspectors determined that MOX Services placed visually accepted piping welds subject to progressive examination in specific lots by the CWE. The lots were organized by specific criteria such as the welder/welding operator, FTS category, welding process, and type and percentage of examination. The inspectors reviewed current open lot reports to verify that MOX Services was adequately implementing the requirements of PP 11-61. The inspectors selected the following welds that were rejected as a result of random radiography to determine if MOX Services adequately implemented code requirements for progressive examination:

- KPA-DS-PLI-T-0633701-06-FW002-C0R0 (CRT-MOX-0275)
- KCD-DS-PLI-T-5452200-01-FW003-C0R0 (CRT-MOX-0392)

The inspectors verified that welds selected for random radiography were selected either by QC or CWE. The inspectors verified that lots are adequately opened and closed in accordance with MOX Services procedural requirements. The inspectors verified that MOX Services selected two additional welds from the lot associated with the rejected weld.

(b) Conclusion

The inspectors observed construction activities related to PSSC-023, Fluid Transport Systems. The inspection attribute observed was special processes and the associated IROFS components were field welds KPA-DS-PLI-T-0633701-06-FW002-C0R0 and KCD-DS-PLI-T-5452200-01-FW003-C0R0. The inspectors reviewed applicable

documentation and interviewed personnel to determine if MOX Services adequately implemented applicable ASME code requirements regarding the performance of random radiography and progressive sampling. No findings of significance were identified.

(3) Attribute: Fabrication (IP 88136, Mechanical Components)

(a) Scope and Observations

The inspectors observed the applicant perform field bending of piping (spool C151-KWD-DS-PLI-T-5342101) in the Secured Warehouse in accordance with PP 11-72, Cold Bending of Pipe/Tubing. The inspectors verified that the work was performed in accordance with an approved work package. The inspectors verified that MOX Services implemented adequate controls to prevent the cross-contamination of carbon steel and stainless steel including specific controls to clean and passivate any components that came into direct contact with carbon steel as a result of contact with bending dies and mandrels. The inspectors verified that the bending machine was approved for use, and verified that the bending die provided a minimum bending radius of five times the outside bending diameter.

The inspectors observed QC perform the final inspection including verification of no visual defects, compliance with ovality specifications, and verification of minimum wall thickness. The inspectors reviewed training records to verify that QC inspectors were certified in accordance with the requirements of ASNT-TC-1a, Personnel Qualification and Certification of Nondestructive Examination. The inspectors verified that the measuring and test equipment (M&TE) used for ultrasonic testing was properly controlled and calibrated.

(b) Conclusion

The inspectors observed construction activities related to PSSC-023, Fluid Transport Systems. The inspection attribute observed was special processes and the associated IROFS component was pipe spool C151-KWD-DS-PLI-T-5342101. The inspectors verified that field bending of piping was performed in accordance with ASME code and project procedure requirements. No findings of significance were identified.

(4) Attribute: Installation (IP 88136, Mechanical Components)

(a) Scope and Observations

The inspectors reviewed the final closure work package for installation of tank KPA*TK5300 initially placed in BAP room D-110 in 2009. Although several tanks located in the BAP had been placed 3 to 4 years ago, the work packages for installation of the tanks were being completed and closed in the first quarter of 2013. The inspectors performed a detailed review of design document DCS01-ZMJ-DS-NTE-N-65107, Torque Table General Notes, and WP 09-10888-C1935-AP-KPA-TK5300-M. This WP documented the installation of the mounting plates, placement of the tank, orientation of the tank, performance of the grouting of the area around the base of the tank and the torquing of the fasteners to hold the tank in place for KPA*TK5300.

The inspectors noted that design document DCS01-ZMJ-DS-NTE-N-65107 and Engineering Change Request (ECR)-006734 both identified the proper sequencing of

fastener installation and acceptance criteria for the torquing of the fasteners. The inspectors also noted that the sequence and the torquing of the fasteners as detailed in the WP were inconsistent with the design document and the ECR. The inspectors noted that the Torque Data Sheet provided a hold point for QC inspection activities. Per the WP, the QC inspector was required to inspect the torquing of fasteners to ensure acceptance criteria were met. However, the inspectors determined that MOX Services' QC used the incorrect acceptance criteria in the WP to perform their final inspection of the fasteners.

MPQAP, Section 3, Design Control, Section 3.1, General, states, in part that QA procedures … include appropriate quantitative and/or qualitative acceptance criteria for determining that activities have been satisfactorily accomplished.

Contrary to the above, appropriate quantitative and or qualitative acceptance criteria for determining that activities have been satisfactorily accomplished were not included in QA procedures in that the WP contained incorrect installation and acceptance criteria for the fasteners. As a result, MOX Services' QC used the incorrect acceptance criteria in the WP during their final inspection of the fasteners, and did not identify that the fasteners had been incorrectly installed and torqued.

Specifically, the correct acceptance criteria contained in design document, DCS01-ZMJ-DS-NTE-N-65107, Torque Table General Notes, and ECR-006734 were not flowed down to WP 09-1088-C1935-AP-KPA-TK5300-M. This resulted in a WP with inappropriate acceptance criteria. Consequently, the inappropriate acceptance criteria in the work package precluded the QC function from reaching a correct conclusion with regard to the specified installation and torquing requirements of the fasteners to hold tank KPA*TK5300 in place.

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-13-082), this violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy: NCV 70-3098/2013-001-003, Inappropriate Acceptance Criteria in Work Package Results in Incorrect Inspection Requirements for Torquing of Tank Fasteners.

The inspectors determined that this finding was more than minor because it represented a process (work package) which impacted the quality oversight function that, if left uncorrected, could adversely affect the quality of the construction of safety related components. In this case, QC performed the inspection and signed off that the torquing met the design requirements resulting in bolting that was improperly torqued and did not meet the design requirements. The finding is a SL IV because it did not involve multiple examples of deficient construction related to the QA breakdown of a single work activity.

(b) Conclusion

The inspectors reviewed construction activities related to PSSC-023, Fluid Transport System, as described in Table 5.6-1 of the MFFF CAR. The inspection attribute observed was installation. The associated IROFS component was tank KPA*TK5300. Specifically, the inspectors performed a detailed review of the recently closed work package for chemical processing tank KPA*TK 5300. The detailed inspection activities identified one violation associated with work package WP 09-1088-C1935-AP-KPA-

TK5300-M. NCV 70-3098/2013-001-003 was identified for inappropriate acceptance criteria in work package results in incorrect inspection requirements for torquing of tank fasteners.

(5) Attribute: Control of Materials, Equipment, and Services (IP 88136, Mechanical Components)

(a) Scope and Observations

The inspectors conducted a tour of the BAP work areas to determine if MOX Services was adequately implementing requirements associated with cleanliness and foreign material exclusion for the process tanks and piping. During the tour, the inspectors noted a total of eight missing or damaged caps on process tank nozzles for KPA*TK8500. The purpose of the caps was to prevent the entry of foreign material during storage and construction. The inspectors reviewed the cleaning, drying, and packaging requirements contained in DCS01-KKJ-DS-SPE-L-16263-3, Procurement Specification for Slab Tanks. Section 5.1, Cleaning, Drying, and Packaging, states, in part, after final cleaning, the slab tanks are to be sealed and the vessel integrity plugs installed as required by DCS01-KKJ-CG-NTE-L-03509-1, Welded Equipment Design Requirements for Process Nozzle Installations. This specification requires the installation of vessel integrity plugs which consists of a mechanical plug, safety wire, and heat shrink tubing. Based on their observations, the inspectors concluded the vendor did not install vessel integrity plugs, but instead installed plastic caps.

MPQAP, Section 5, Instructions, Procedures, and Drawings, Section 5.1, General, states, in part, 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 Services' project work scope.

PP10-38, Storage and Control of Material, Revision 0, specifies requirements for the storage and handling of QL-1 items. Specifically, Section 3.4, Special Storage Considerations, Paragraph 3.4(f) states, in part, that items in storage shall have all covers, caps, plugs, or other closures intact.

Contrary to this requirement, prior to March 27, 2013, MOX Services failed to ensure that quality-affecting activities were performed in accordance with documented, approved QA procedures and other approved implemented documents appropriate to the MOX Services Project work scope. Specifically, MOX Services failed to follow PP 10-38, Storage and Control of Material, which requires that items in storage have all covers, caps, plugs, or other closures intact. 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 were entered into the applicant's corrective action program (CR-13-018), this violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy: NCV 70-3098/2013-001-004, Failure to Ensure that Process Tank Covers, Caps, and Plugs Remain Intact.

The inspectors determined that this finding was more than minor because it represented an inadequate process and quality oversight function (cleanliness) that, if left uncorrected, could adversely affect the quality of the construction of safety related components. Specifically, the inspectors determined that would be difficult to remove

foreign items from the tank because the tank does not have an access opening or drain. In addition, the presence of foreign items in the tank has the potential to interfere with the operation of IROFS instrumentation for the prevention of criticality and chemical safety events. The finding is a SL IV because it did not involve multiple examples of deficient construction related to the QA breakdown of a single work activity.

(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 control of materials, equipment, and services. The associated IROFS component was KPA*TK8500. The inspectors performed a walk down of BAP process tanks to determine if MOX Services was adequately implementing NQA-1, Quality Assurance Requirements for Nuclear Facilities Applications (NQA-1-1994 Edition), for cleanliness and foreign material exclusion. NCV 70-3098/2013-001-004 was identified for failure to ensure that items in storage shall have covers, caps, plugs, or other closures intact.

d. PSSC-024, Gloveboxes

(1) Attribute: Special Processes (IP 88134, Quality Assurance: Piping Relied on for Safety; IP 55050, Nuclear Welding General Inspection Procedure; IP 88136, Mechanical Components)

(a) Scope and Observations

The inspectors reviewed fabrication documentation (such as drawings, welding, and NDE) of the QL-1 KDA*GB7000 convenience can opening glovebox to determine whether welding and NDE procedures, welder and NDE personnel qualifications, shell material, weld filler metal, and inspections were in accordance with the requirements of American Welding Society (AWS) D1.6, Structural Welding Code – Stainless Steel.

The inspectors reviewed an Industrial Testing Laboratory Services test report L17273, dated July 28, 2011, for commercial grade dedicated A240 Type 304L stainless steel plate with heat number 8ND1 to determine whether the critical characteristics for chemical analysis and mechanical properties were in accordance with requirements of NQA-1-1994 Edition and the material specification of the American Society for Testing and Materials (ASTM).

The inspectors reviewed an Industrial Testing Laboratory Services test report L17379-1, dated August 10, 2011, for commercial grade dedicated ER316L stainless steel bare welding rods of both 1/16 inch and 3/32 inch diameters with heat number 526552 to determine whether the critical characteristics for chemical analysis were in accordance with the requirements of ASME NQA-1-1994 Edition and the AWS A5.9, Specification for Bare Stainless Steel Welding Electrodes and Rods.

The inspectors reviewed an Element Materials Technology test report BYE-002-12-07-68683-1, dated December 9, 2011, for commercial grade dedicated ER316L stainless steel wire of 0.035 inch diameter with heat number 529035 to determine whether the critical characteristics for chemical analysis were in accordance with the requirements of NQA-1-1994 Edition and the AWS A5.9.

The inspectors reviewed Byers Precision Fabricators manual Gas Tungsten Arc Welding (GTAW) welding procedure, 10888-B-6661-001, Revision 0, for austenitic stainless steel pipe to determine whether the standard welding procedure specification (WPS) for thicknesses of 1/16 inch to 1 ½ inch in the as-welded condition was in accordance with the requirements of AWS D1.6.

The inspectors reviewed Byers Precision Fabricators manual GTAW welding procedure, AWS B2.1-8-024:2001, Revision 5, for austenitic stainless steel plate to determine whether the standard WPS for thicknesses of 1/16 inch to 1 ½ inch in the as-welded condition was in accordance with the requirements of AWS D1.6.

The inspectors reviewed the Byers Precision Fabricators, Welding Program and Welder Qualification & Certification, QP-2(6.2.2)-007, Revision 0, and certification for welder 146 to determine whether qualification on plate was in accordance with the requirements of AWS D1.6.

The inspectors reviewed three Byers Precision Fabricators, NDE PT/ultrasonic testing (UT) weld map drawings 71001-M1-WM for the top, front, and right corner side assemblies of the shell to determine whether weld symbols and NDE were in accordance with AWS D1.6 for complete joint penetration of double-V groove butt joints.

The inspectors reviewed three Byers Visual Weld Inspection Reports for the left side and front side assemblies of the shell to determine whether the welder ID traceability for each weld and visual examinations were in accordance with the requirements of AWS D1.6.

The inspectors reviewed Stork Herron Testing Laboratories NDE-UT and -PT Level II personnel certification and qualification record and vision test records for ultrasonic and liquid penetrant examinations to determine whether qualifications, training, examination results, and experience were in accordance with the requirements of ASNT SNT-TC-1A and signed by NDE-Level III.

The inspectors reviewed three Byers NDE-PT Inspection Reports, DRW# 71001-M1-WM(ASM), –M1-RS-WM, and M1-BACK-WM to determine whether liquid penetrant examinations were in accordance with the requirements of AWS D1.6.

The inspectors reviewed Byers procedure No. 10888-B-6661-001, Revision 2, for UT to determine whether the procedure was written in accordance with the requirements of AWS D1.6.

The inspectors reviewed two Byers NDE-UT Inspection Reports, DRW# 71001-M1-WM-(ASM) and –M1-RS-WM to determine whether ultrasonic examinations were in accordance with the requirements of AWS D1.6.

(b) Conclusions

The inspectors observed construction activities related to PSSC-024, Gloveboxes, as described in Table 5.6-1 of the MFFF CAR. The inspection attribute observed was special processes. The associated IROFS component was KDA*GB7000. The inspectors reviewed welder qualification records, weld procedure qualification records, weld procedure specifications, weld data sheets, computerized radiography images, and

CMTRs for weld filler metal and base metals for compliance with applicable code requirements. No findings of significance were identified.

(2) Attribute: Quality Assurance Interfaces (IP 88116, Inspection of Safety Function Interfaces for the Mixed Oxide Fuel Fabrication Facility (Pre-Licensing and Construction))

(a) Scope and Observations

The inspectors examined the safety function interface between the Integrated Safety Analysis (ISA) and design engineering. The inspectors reviewed the criticality-related parameters credited for the prevention of criticality in PSI*GB1000. The inspectors determined that the applicable parameters were geometry control, neutron absorber control, and moderation control.

The inspectors reviewed the NCSE-D and corresponding calculation to determine if the criticality controlled parameters assumed in the analysis were consistent with the parameters. The inspectors reviewed design drawings to determine if MOX Services correctly specified the required criticality dimensions assumed in the NCSE-D. In the area of quality levels, the inspectors reviewed various design drawings, calculations, and technical documents to verify that documents involving criticality safety requirements were properly marked as QL-1.

The inspectors reviewed the glovebox structural qualification calculation to determine if the structural analysis adequately evaluated the ability of criticality IROFS design features to withstand a design earthquake (DE). Specifically, the design features credited in the NCSE-D included maintaining spacing between storage compartments, ensuring effectiveness of neutron absorbing material, and capability of mechanical stops and catch pan to withstand a DE.

The inspectors reviewed various ECRs to verify that relevant design information was carried through into design changes. Specifically, the inspectors reviewed ECR-017705, Replace NS-41 with Neutron Absorber. This particular ECR changed the neutron absorbing material in the pellet storage units. The inspectors verified that MOX Services performed an adequate technical evaluation of the replacement material including a direct comparison of boron content, hydrogen content, and density. The inspectors verified that the ECR was properly marked as QL-1 and that proper reviews by interdisciplinary groups were performed.

(b) Conclusions

The inspectors observed construction activities related to PSSC-024, Gloveboxes, as described in Table 5.6-1 of the MFFF CAR. The inspection attribute observed was quality assurance interfaces. The associated IROFS component was PSI*GB1000. The inspectors reviewed the NCSE-D, criticality calculation, glovebox design drawings, structural calculation, criticality safety dimensional reports, and ECRs to determine if MOX Services adequately controlled safety function interfaces between the ISA and design engineering groups. No findings of significance were identified.

e. PSSC-032, Material Handling Equipment

(1) Attribute: Control of Materials, Equipment, and Services (IP 88108, Control of Materials, Equipment, and Services)

(a) Scope and Observations

The inspectors reviewed DCS01-ZMJ-DS-CGD-M-65875-2, Commercial Grade Item Evaluation for Jar Tilter Hydraulic Dampers, to determine if MOX Services adequately implemented the CGD program as outlined in MPQAP, Section 7, Control of Purchased Material, Equipment, and Services. The inspectors reviewed the technical evaluation including the functional classification of the component; failure mechanisms, modes, and effect analysis; seismic qualification considerations; sampling plan description; and assumptions/reasoning to determine if MOX Services adequately described the component's safety function and applicable failure mechanisms. The inspectors reviewed the critical characteristics and acceptance methods to determine if they provided reasonable assurance that the component could perform its intended safety function.

The inspectors noted that MOX Services selected the following critical characteristics: (1) part number/identification, (2) positive material identification (PMI), (3) functional testing, and (4) pressure testing of the damping cylinder components. The inspectors reviewed completed commercial grade dedication documentation including CGD forms, hydrostatic test reports, PMI, and functional test reports to determine if the critical characteristics were adequately verified. The inspectors performed a visual inspection of the damping cylinder at the PAF following a functional test and to determine if the part numbers matched the part numbers specified in the detailed design.

(b) Conclusions

The inspectors observed construction activities related to PSSC-032, Material Handling Equipment, as described in Table 5.6-1 of the MFFF CAR. The inspection attribute observed was control of materials, equipment, and services. The associated IROFS component was the Homogenization and Pelletizing Unit (NPG) jar tilter hydraulic damper. The inspectors reviewed completed commercial grade dedication documentation, vendor test reports, PMI results, and ECRs. The inspectors concluded that MOX Services adequately implemented its commercial grade dedication program as described in MPQAP, Section 7, Control of Purchased Material, Equipment, and Services. No findings of significance were identified.

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

(1) Attribute: Installation (IP 88132, Structural Concrete; and IP 88134, Piping Relied on for Safety)

(a) Scope and Observations

During the inspection period, the inspectors observed the following activities associated with PSSC-036, MFFF building structure (including vent stack):

1) Installation of structural reinforcing steel in the BMP, the BAP, and BSR

2) Installation of embedded piping, embedded support plates, and plant grounding system in all three buildings
3) Concrete placements in walls of the BSR, BAP, and BMP and placement of the roof section of the BMP
4) Operation of the concrete batch plant
5) Receipt of cement, fly ash, sand and gravel
6) Concrete testing in the field (slump, air entrainment, and temperature)
7) Installation of building grounding cables in various floors and walls
8) Surveys (proper positioning/location) of embedded piping and embedded plates
9) Cleanliness of areas prior to concrete placement, and maintenance of cleanliness during the concrete placements
10) Installation of coatings in the BAP and BMP

The inspectors observed routine lifts conducted to position reinforcing steel and embedded plates; installation and removal of concrete retaining walls; and movement of equipment such as generators, pumps, temporary lighting, and toolboxes. The lifts were conducted in accordance with the applicant's procedures. The inspectors reviewed the applicable sections of the MPQAP and verified that installations of the structural reinforcing steel, embedded plates, embedded piping, and electrical grounding of the MFFF structures were in accordance with QA programmatic requirements. Specifically, the inspectors verified that installations were in accordance with applicable field drawings and met the general construction notes.

The inspectors evaluated the adequacy of ongoing concrete placement activities conducted by Alberici, S&ME, and MOX Services. The inspection of these activities focused on reinforcing steel bar installation, formwork preparation, pre-placement testing, and placement procedures associated with QL-1 concrete construction of the MFFF building structure.

The inspectors observed various activities prior to and during each major concrete placement. Prior to selected placements, the inspectors selectively checked for proper placement of reinforcing steel, including proper lap splices, supports, and bar spacing, alignment, and proper clear cover. The inspectors selectively checked for proper embed plate placement by observing ongoing surveys and verified embed plate support structures were properly restrained. The inspectors observed placement of embedded piping, installation of piping supports, mounting of piping to supports, installation of galvanic sleeves between piping and supports, and verified cleanliness of the placement area.

The inspectors observed the installation of the grounding system for the reinforcing steel, including embedded grounding posts for future equipment installation. During the placements, the inspectors observed proper lift heights as well as MOX Services' field engineers and QC personnel performing inspections of the reinforcing steel, embed plates, embed piping, cleanliness prior to placements, and detailed observations of the placements.

The inspectors observed that concrete samples were collected at the prescribed frequency and noted that the slump and air content met the acceptance criteria or were appropriately dispositioned with NCRs. The inspectors also observed that once collected the concrete test cylinders were temporarily stored per procedure prior to transport to S&ME for curing and later testing. Batch plant operators correctly

implemented procedural requirements and were in constant communication with the concrete placement crews. The inspectors reviewed concrete cylinder break test records performed and documented by S&ME. The inspectors noted that the cylinder breaks met the acceptance criteria specified in American Concrete Institute (ACI)-349, Code Requirements for Nuclear Safety Related Concrete Structures.

The following list is a summary of the reviewed concrete placement activities:

January 4, 2013, BAP-R25A/26A, BAP roof, 1055 cubic yards
January 9, 2013, BAP-W407.2/409.3, BAP Interior Wall, 77 cubic yards
January 10, 2013, BMP-GW7C.3, BMP Gabion Wall, 50 cubic yards
January 15, 2013, BAP-W408.1/410.3, BAP Interior Wall, 107 cubic yards
January 18, 2013, BMP-F224/307.A, BMP Floor, 2 cubic yards
January 18, 2013, BSR-FD201.1, BSR Floor, 18 cubic yards
January 23, 2013, BAP-W407.4, BAP Interior Wall, 77 cubic yards
January 24, 2013, BAP-W410.4/408.2, BAP Interior Wall, 95 cubic yards
January 31, 2013, BAP-R25B/26B, BAP Roof, 838 cubic yards
February 5, 2013, BMP-GW12B.2, BMP Gabion Wall, 75 cubic yards
February 15, 2013, BAP-TCO-C123, BAP Temporary Opening, 10 cubic yards
February 15, 2013, BAP-TCO-C151, BAP Temporary Opening, 10 cubic yards
February 24, 2013, BMP-R23A/24A/19A, BMP Roof, 1090 cubic yards
March 14, 2013, BAP-R23B/24B/19B, BAP Roof, 1203 cubic yards
March 15, 2013, BMP-FD201/211, BMP Floor, 7.5 cubic yards
March 15, 2013, BMP-F203.1, BMP Floor, 3.5 cubic yards

The inspectors performed various reviews for the above placements, which included walk downs with the field engineers, walk downs with QC personnel, verification of reinforcing bar (rebar) by use of field drawings, reviews of WPs, and routine walk downs of the area to verify adequate cleanliness prior to concrete placement.

(b) Conclusions

Construction activities related to PSSC-036 as described in Table 5.6-1 of the MFFF CAR were adequately performed and included installations of reinforcing steel, embedded plates and ground cables; concrete placements; operation of the batch plant; heavy lifts of equipment and supplies; verification of equipment placements by surveys; rebar installation; placement of concrete; welding; non-destructive testing; installation of tanks; and receipt of materials. These construction activities were performed in a safe and quality related manner and in accordance with procedures and WPs. No findings of significance were identified.

4. Follow-up of Previously Identified Items

a. (Closed) Violation (VIO) 70-3098/2010-001-03: Failure to Adequately Identify Test Requirements and Evaluate Test Results

(1) Scope and Observations

On or before March 8, 2010, the applicant failed to adequately identify test requirements and evaluate test results for QL-1 backfilling activities pertaining to PSSC-053, Waste Transfer Line. Specifically, documentation required to verify conformance of QL-1 fill

material did not adequately identify all items to be tested as required by ASME NQA-1-1994 Edition, Part II, Subpart 2.5, Section 5. Additionally, test results were not adequately evaluated by responsible personnel to ensure conformance with established acceptance criteria. The inadequate review of test documentation resulted in the inadvertent use of non-conforming material in a QL-1 application.

For the abovementioned, the applicant generated CR-10-180 and CR-10-126. CR-10-180 was generated to perform a comprehensive review of ASME NQA-1-1994 Edition, Part II, Subpart 2.5, Section 5, in order to identify all necessary requirements. CR-10-126 was written to address the adequacy of reviews related to vendor submittals. As part of the corrective actions associated with these CRs, the applicant performed a reconciliation of NQA-1-1994 Edition, Subpart 2.5, for all civil structural specifications and design basis documents. When the reconciliation was complete, the soil specification DCS01-WRT-DS-SPE-B-09307 was reviewed and revisions were made as needed. In addition, the applicant performed a review to ensure that all backfill material in question met the project specifications. Any material identified as nonconforming was either evaluated or received additional testing to ensure that it was acceptable for use.

Other applicant actions included assigning a Subcontract Responsible Engineer to perform review of submittals from the soils testing vendor, and providing required training to the Subcontract Responsible Engineer and QC inspectors responsible for reviewing test submittals from the vendors for material acceptance. Finally, MOX Services performed an extent of condition for other NQA-1-1994 Edition Subparts that were committed to in the MPQAP to ensure continued compliance. Based on the review of CR-10-180, CR-10-126, associated NCRs, and ECRs, the inspectors determined the prescribed corrective actions adequately addressed the conditions adverse to quality in accordance with the applicant's corrective action program.

(2) Conclusion

VIO 70-3098/2010-001-03, Failure to Adequately Identify Test Requirements and Evaluate Test Results, was closed based on the review of the associated documentation and implemented corrective actions.

b. (Closed) VIO 70-3098/2010-002-002**:** Inadequate Construction Specification Change

(1) Scope and Observations

On February 23, 2010, the applicant failed to translate applicable ASME NQA-1-1994 Edition requirements into construction specification DCS01-WRT-DS-SPE-B- 09307, Section 02316-Excavation, Backfilling, and Compaction for Utilities, Quality Level 1a (IROFS), Revision 2 (pertaining to PSSC-053 Waste Transfer Line). Specifically, ECR 005683, Revision 0, introduced and approved the option to eliminate the field density test requirement per ASTM D1556, which was required by NQA-1-1994 Edition, Subpart 2.5, Section 5, from construction specification DCS01-WRT-DS-SPE-B-09307, Revision 2.

For the abovementioned, the applicant revised CR-10-180 to include actions to address the elimination of the field density correlation test requirement as required per ASTM D1556. As part of the corrective actions associated with this CR, the applicant performed a reconciliation of NQA-1-1994 Edition, Subpart 2.5 for all civil structural

specifications and design basis documents, and made revisions as needed. The applicant also performed additional testing for material used as backfill for piping to ensure strict compliance with NQA-1-1994 Edition, Subpart 2.5. Based on the review of CR-10-180, associated NCRs, and ECRs, the inspectors determined the prescribed corrective actions adequately addressed the conditions adverse to quality in accordance with the applicant's corrective action program.

(2) Conclusion

VIO 70-3098/2010-002-02, Inadequate Construction Specification Change, was closed based on the review of the associated documentation and implemented corrective actions.

c. (Closed) Unresolved Item (URI) 70-3098/2012-002-002: Review of Pellet Handling Fire Door Commercial Grade Dedication Documentation and Material Test Reports (Opened/Closed) Example 2 of NCV 70-3098/2013-001-002: Failure to Ensure that Design Changes Were Reviewed by Affected Organizations

(1) Scope and Observations

During the second quarter of 2012, MOX Services failed to properly procure the PML fire door intumescent fire sealing material as a QL-1 item (pertaining to PSSC-021, Fire Barriers). The sealing material was incorrectly specified as a QL-4 item in the BOM as the result of a design error. Due to the design error, MOX Services failed to procure the material as a QL-1 item including the performance of commercial grade dedication. This issue was entered into the MOX Services' corrective action program as CR-12-359, Incorrect QL for Intumescent Material on PML Fire Doors.

The inspectors reviewed CR-12-359 to determine if MOX Services implemented adequate corrective actions to correct the deficiency. During the review, the inspectors noted that the issue was not limited to the intumescent sealing material, but also affected other specialty insulation materials that were also credited to provide a two hour fire barrier during a postulated fire event. The inspectors were informed that a similar design error had occurred and that these materials were improperly procured as QL-4.

During their review, the inspectors noted that MOX Services changed the quality level of the intumescent material on the BOM from QL-1 to QL-4 during the conformance design phase. The inspectors noted that DCS01-PML-DS-NTE-M-22487, Pellet Handling Unit (PML) Component Classification Summary (CCS), was not revised when the quality level of the fire sealing material changed from QL-1 to QL-4. The inspectors also reviewed the affected BOMs and detailed design drawings to determine if the Nuclear Safety group provided review and approval of the documents by signing the document cover sheet. Based on their review, the inspectors concluded that MOX Services failed to obtain the proper reviews by Nuclear Safety as required by Step 3.12.9 of PP 9-3, Design Control. Specifically, Step 3.12.9 states, in part, any change to IROFS shall be reviewed by Nuclear Safety and the nuclear safety evaluations (NSEs) and NCSEs shall be updated in accordance with Section 3.6.2.3.1.

MPQAP, Section 5, Instructions, Procedures and Drawings, states in part, that quality-affecting activities are performed in accordance with documented, approved QA

procedures and other approved implementing documents (drawings, specifications, etc.) appropriate to the MOX Project work scope.

MPQAP, Section 3, Design Control, Section 3.1, General, states, in part, that QA procedures detail the controls for design input, design process, design verification, design changes and approval.

QA procedure PP 9-3, Design Control, Section 3.12, Revisions, Subsection 7, states, in part, that changes shall be reviewed by the organizations or disciplines affected by the change as determined by the Responsible Manager (RM) or Lead Engineer (LE) responsible for the document revision.

Contrary to this requirement, the inspectors concluded that MOX Services failed to follow QA procedures that govern the design change control process. Specifically, MOX Services failed to ensure that design changes were reviewed by the organizations or disciplines affected by the change as required by Step 3.12.7 of PP 9-3. Specifically, MOX Services failed to ensure that these changes to IROFS were reviewed by Nuclear Safety.

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 were entered into the applicant's corrective action program (CR-12-359), this violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy: Example 2 of NCV 70-3098/2013-001-002, Failure to Ensure that Design Changes Were Reviewed by Affected Organizations.

The inspectors determined that this finding was more than minor because it represented an inadequate process and quality oversight function (inadequate design control) that, if left uncorrected, could adversely affect the quality of the fabrication and construction of safety related components. Specifically, the issue involved a deficiency in construction that required supplemental examination, inspection, or test to establish the adequacy of the SSC to perform its intended safety function. The finding is a SL IV because it did not involve multiple examples of deficient construction related to the QA breakdown of a single work activity.

(2) Conclusion

URI 70-3098/2012-002-002, Review of Pellet Handling Fire Door Commercial Grade Dedication Documentation and Material Test Reports, was closed and Example 2 of NCV 70-3098/2013-001-002, Failure to Ensure that Design Changes Were Reviewed by Affected Organizations, was identified for failure to ensure that a criticality-related IROFS design change was properly reviewed by Nuclear Safety as required by PP 9-3, Design Control.

d. (Closed) URI 70-3098/2012-003-002: Potential Failure to Maintain Records of Changes to License Application (LA) Commitments

(1) Scope and Observations

During the third quarter of 2012, the inspectors noted that MOX Services was not maintaining records of changes to the use of codes and standards that were committed

to in the LA. In addition, these changes were not reported to the NRC on an annual basis by January 30 of each year. MOX Services placed this issue in the corrective action program as CR-12-338 to determine if the changes to various code requirements should be considered changes to the LA and therefore reported. This issue was identified as URI 70-3098/2012-003-002, Potential Failure to Maintain Records of Changes to LA Commitments.

Subsequently, the NRC concluded that MOX Services was required to maintain records of changes and to report those changes to the NRC on an annual basis. MOX Services was found to be in violation of the reporting requirements of 10 CFR 70.72. On March 21, 2013, the NRC issued a letter for exercising enforcement discretion. The letter stated that MOX Services was required by regulation to submit the required annual updates by January 30 of each year. The letter also stated that the failure to submit the required annual updates constituted a violation of NRC requirements; however, the NRC concluded that the violation resulted from matters not reasonably within MOX Services' control due to clarity of the requirement and associated guidance. Using the NRC's Enforcement Policy, the violation met the criteria for enforcement discretion. Thus, the NRC refrained from issuing enforcement action for the violation and the NRC will not take any enforcement action related to this issue for previous years. Additionally, the applicant was granted an extension for the 2013 update of the ISA and LA until May 31, 2013.

(2) Conclusions

URI 70-3098/2012-003-02, Potential Failure to Maintain Records of Changes to LA Commitments, was closed based on the exercise of enforcement discretion contained in letter EA-13-035, dated March 21, 2013.

5. Exit Interviews

The inspection scope and results were summarized throughout this reporting period and by the resident inspectors on April 17, 2013. No dissenting comments were received from 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

MOX Services

J. Burnette, Chemical and Mechanical Engineering Manager
M. Gober, Vice President Engineering
D. Gwyn, Licensing Manager
D. Ivey, Quality Assurance Manager
R. Justice, Quality Assurance Corrective Action Manager
D. Kehoe, Quality Assurance Engineer
S. Marr, Executive Vice President and Deputy Project Manager
S. Murphy, Construction Manager
E. Najmola, Vice President of Construction
J. Peregoy, Quality Control Manager
E. Radford, Regulatory Compliance
K. Trice, President and Chief Operating Officer
R. Whitley, Vice President Project Assurance
L. Wood, Regulatory Compliance

2. INSPECTION PROCEDURES (IPs) USED

IP 55050	Nuclear Welding General Inspection Procedure
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 88116	Inspection of Safety Function Interfaces
IP 88130	Resident Inspection Program For On-Site Construction Activities at the Mixed-Oxide Fuel Fabrication Facility
IP 88132	Structural Concrete Activities
IP 88134	Piping Systems Relied on for Safety
IP 88136	Mechanical Components
IP 88143	Pipe Supports and Restaints

3. LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Item Number	Status	Description
NCV 70-3098/2013-001-001	Opened/Closed	Failure to Follow Project Procedures that Assure that Only Correct and Accepted Material, Parts, and Components Were Used or Installed. (Section 3.a(1))
NCV 70-3098/2013-001-002	Opened/Closed	Failure to Ensure that Design Changes Were Reviewed by Affected Organizations (two

		examples) (Sections 3.b(1) and 4.c(1))
NCV 70-3098/2013-001-003	Opened/Closed	Inappropriate Acceptance Criteria in Work Package Results in Incorrect Inspection Requirements for Torquing of Tank Fasteners (Section 3.c(4))
NCV 70-3098/2013-001-004	Opened/Closed	Failure to Ensure that Process Tank Covers, Caps, and Plugs Remain Intact (Section 3.c(5))
VIO 70-3098/2010-001-003	Closed	Failure to Adequately Identify Test Requirements and Evaluate Test Results (Section 4.a)
VIO 70-3098/2010-002-002	Closed	Inadequate Construction Specification Change (Section 4.b)
URI 70-3098/2012-002-002	Closed	Review of Pellet Handling Fire Door Commercial Grade Dedication Documentation and Material Test Reports (Section 4.c)
URI 70-3098/2012-003-002	Closed	Potential Failure to Maintain Records of Changes to License Application (LA) Commitments (Section 4.d)

4. LIST OF ACRONYMS USED

ACI	American Concrete Institute
ADAMS	Agency-Wide Document Access and Management System
ASME	American Society of Mechanical Engineers
ASNT	American Society for Nondestructive Testing
ASTM	American Society of Testing and Materials
AWS	American Welding Society
BAP	Aqueous Polishing Building
BMP	MOX Process Building
BOM	Bill of Materials
BSR	Shipping and Receiving Building
CAR	Construction Authorization Request
CCS	Component Classification Summary
CGD	Commercial Grade Dedication
CHH	HVAC Chilled Water
CIB1, 2, 3	Construction Inspection Branch 1, 2, or 3
CMTR	Certified Material Test Report
CPB1, 2, 3	Construction Projects Branch 1, 2, or 3
CR	Condition Report
CWE	Construction Welding Engineer

DCI	Division of Construction Inspection
DCP	Division of Construction Projects
DE	Design Earthquake
ECR	Engineering Change Request
FE	Field Engineer
FTS	Fluid Transport System
GTAW	Gas Tungsten Arc Welding
ID	Identification
IP	Inspection Procedure
IR	Inspection Report
IROFS	Items Relied on for Safety
ISA	Integrated Safety Analysis
KWD	Liquid Waste Reception
LA	License Application
LE	Lead Engineer
LLLW	Low Level Liquid Waste
M&TE	Measuring and Test Equipment
MFFF	MOX Fuel Fabrication Facility
MOX	Mixed Oxide
MOX Services	Shaw AREVA MOX Services
MPQAP	MOX Project Quality Assurance Plan
NCR	Non-conformance Report
NCSE-D	Nuclear Criticality Safety Evaluation
NCV	Non-cited Violation
NPG	Homogenization and Pelletizing Unit
NDE	Non-Destructive Examination
No.	Number
NQA-1	Quality Assurance Requirements for Nuclear Facilities Applications
NRC	Nuclear Regulatory Commission
NSE	Nuclear Safety Evaluation
PAF	Process Assembly Facility
P&ID	Piping and Instrument Diagram
PMI	Positive Material Identification
PML	Pellet Handling Unit
PP	Project Procedure
PSI	Scrap Pellet Storage
PQR	Procedure Qualification Record
PSSC(s)	Principle System(s), Structure(s), and Component(s)
PT	Liquid Penetrant Testing
QA	Quality Assurance
QC	Quality Control
QL	Quality Level
QL-1	Quality Level 1
QL-2	Quality Level 2
QL-4	Quality Level 4
QP	Quality Procedure
RT	Radiography Testing
Rebar	Reinforcing Bar
RM	Responsible Manager
RII	Region II
SDD	System Design Description

SDR	Supplier Deficiency Report
SFA	Welding Filler Materials
S&ME	Soils and Materials Engineering, Inc.
SL	Severity Level
SSC	System(s), Structure(s), and Component(s)
STK	Rod Storage and Handling
STR	Subcontract Technical Representative
URI	Unresolved Item
URS	United Research Services
UT	Ultrasonic Testing
UTC	Unique Traceable Commodity
VHD	Very High Depressurization
VIO	Violation
VT	Visual Testing
WP	Work Package
WPS	Welding Procedure Specification
WTS	Welding Technique Sheet

5. LIST OF PSSCs REVIEWED

PSSC-006	C4 Confinement System
PSSC-009	Criticality Control
PSSC-021	Fire Barriers
PSSC-023	Fluid Transport Systems
PSSC-024	Gloveboxes
PSSC-032	Material Handling Equipment
PSSC-036	MOX Fuel Fabrication Building Structure (including vent stack)
PSSC-053	Waste Transfer Line

6. RECORDS AND DOCUMENTS REVIEWED

Procedures

PP9-3, Design Control, Revision 20, ICN 01
PP9-39, Verification of Subcritical Dimensions for Criticality Safety, Revision 0
EG05-8, Engineering Change Control
PP10-38, Storage and Control of Material, Revision 0
PP11-61, Progressive Examination, Revision 0, ICN02
PP11-27, Excavation, Control and Placement of Backfill Material, Revision 0, ICN 01
PP11-72, Cold Bending of Pipe/Tubing

Specifications

Shaw AREVA MOX Services Specification DCS01-KKJ-DS- NTE-L-16279-2, Welding Equipment and Piping General Specification for 316 and 316L Stainless Steel Materials QL-1 IROFS, Revision 2, dated September 6, 2006
Shaw AREVA MOX Services Specification DCS01-KKJ-DS- NTE-L-16279-3, Welding Equipment and Piping General Specification for 316L Stainless Steel Materials QL-1 IROFS, Revision 3, dated April 23, 2008

Shaw AREVA MOX Services Specification DCS01-KKJ-DS- NTE-L-16279-6, Welding Equipment and Piping General Specification for 316L Stainless Steel Materials QL-1 IROFS, Revision 3, January 25, 2012
Shaw AREVA MOX Services Requirements DCS01-ZMJ-DS- SPE-M-19107-7, Process Equipment Welding Requirements QL-1, Revision 7, dated February 27, 2012
DCS01-WRT -DS-SPE-B-09307-3, Section 02316-Excavation, Backfilling,
And Compaction for Utilities, Revision 3
DCS01-AAJ-DS-DOB-B-40103-2, Basis of Design for Structures, Revision 2
DCS01-BKA-DS-SPE-B-09330, Placing Concrete and Reinforcing Steel for Quality Level 1, 2, 3 & 4, Revision's 4 and 6
DCS01-BAA-DS-SPE-B-09350-0
DCS01-ZMJ-DS-NTE-N-65107, Torque Table General Notes
DCS01-KKJ-DS-SPE-L-16263-3, Procurement Specification for Slab Tanks
DCS01-KKJ-CG-NTE-L-03509-1, Welded Equipment Design Requirements for Process Nozzle Installations

Nuclear Safety Documents

DCS01-STK-DS-ANS-H-35023-4, Nuclear Criticality Safety Evaluation (NCSE-D) of the Rod Storage Unit
DCS01-STK-CG-CAL-H-06391-0, Criticality Safety of the Rod Tray Store
DCS01-PPJ-DS-ANS-H-35031-3, Nuclear Criticality Safety Evaluation (NCSE-D) of the Pellet Storage Units
MFFF ISA Summary, Revision, October 2009

System Description Documents

DCS01-KWD-DS-SKK-F-41022-3, AP – Unit KWD Liquid Waste Reception Unit System Design Description
DCS01-PSI-MG-CAL-M-10050-2, Pellet Process Area – BMP Level 1 – Room B-134/135 Scrap Pellet Storage Unit – PSI Glovebox Storage Rack Structural Qualification

Calculations

DCS01-PPJ-CG-CAL-H-06424-D, Criticality Safety of the Pellet Storage and Handling Units PSE, PSF and PSI

Drawings

DCS01-KWD-DS-PLI-T-5087500, Piping Isometric Liquid Waste Reception, Sheet 99, Revision 0
DCS01-KWD-DS-PLI-T-5087500, Piping Isometric Liquid Waste Reception, Sheet 02, Revision 1
DCS01-KWD-DS-PLI-T-5219400, Piping Isometric Liquid Waste Reception, Sheet 01, Revision 1
DCS01-KWD-DS-SCH-F-14738, Aqueous Polishing Unit KWD Low Level Liquid Waste Drip Trays/Floor Drains Process Flow Diagram
DCS01-KPA-DS-PLI-T-0603500, Piping Isometric Purification Cycle, Sheet 01, Revision 0

DCS01-PSI-MG-PLE-M-10101-1, BMP-Level 1-Rooms B134/135 Scrap Pellet Storage Unit Glovebox Storage Rack Assy Module 1 PSI
DCS01-PSI-MG-PLE-M-10100-2, BMP-Level 1-Rooms B134/135 Scrap Pellet Storage Unit Glovebox Storage Rack Assy General Assembly PSI
DCS01-PSP-MG-PLD-M-10208-2, Pellet Storage Unit Storage Rack Assembly Sheet Metal Details Details: M12-15, M17, M41, & M46

Commercial Grade Dedication

DCS01-ZMJ-DS-CGD-M-65875-2, Commercial Grade Item Evaluation for Jar Tilter Hydraulic Dampers

Welding

WTS # B31.3-GTAC-8-8-01, Revision 1
Shaw AREVA MOX Services, LLC QW-484 Record of Welding Operator Qualification for ASME Section IX for Symbol P024
Procedure Qualification Record No. B31.3-GTAC-8-8-3/4-40, March 21, 2011
Welding Open Lot Report dated Tuesday March 5, 2013
Welding Open Lot Report dated Thursday March 7, 2013

Radiography Reports

CRT-MOX-0275
CRT-MOX-0392
CRT-MOX-0415
CRT-MOX-0276

Work Packages

11-CP27-C110-KPA-P-M-0001A, Install KPA Piping in C-110 of BAP
09-1088-C1935-AP-KPA-TK-5300-M

Condition Reports

CR-13-019, NCSE Moderator Controlled Room Violation
CR-13-064, QL-1 Material Control
10888-MOX-CR-10-126, Inadequate Review of Vendor Submittals
10888-MOX-CR-10-130, Acceptance of Soils Testing Reports
10888-MOX-CR-10-180, Soils Test Requirements Missed in Specification
10888-MOX-CR-10-615, Technical justification for backfill placement will require a change to the MPQAP
10888-MOX-CR-10-621, Tracking and Follow-up of Commitments in Regulatory Correspondence
10888-MOX-CR-11-248, QC Inspection Deficiencies
10888-MOX-CR-11-249, Sand Cone Correlation Testing
CR-13-081
CR-12-359, Incorrect QL for Intumescent Material on PML Fire Doors

ECRS

ECR-019850

ECR-001046
ECR-001092
ECR-001273
ECR-002133
ECR-020329
ECR-017070
ECR-017705
ECR-004271
ECR-017727
ECR-014109
ECR-005683, To add another option for correlation of the nuclear test gauge, Revision 3
ECR-006415, Revision to DCS01-WRT-DS-SPE-B-09307 to include unit weight requirements, Revision 3
ECR-006415, Revision to DCS01-WRT-DS-SPE-B-09307 to include unit weight requirements, Revision 4
ECR-008741, Revisions to DCS01-WRT-DS-SPE-B-09307 for multiple clarifications and to include NQA-1 requirements, Revision 1
ECR-010174, Reconciliation of NQA-1 Subpart 2.5 and 2.2 requirements with specification DCS01-AAJ-DS-DOB-B-40103-2, Revision 0
ECR-006734

Nonconformance Reports

NCR-13-4870
EN-10-1737, F2 and F3 material used on the Rad Waste Line
QC-10-1748, Proctor CF-78 did not meet the bedding and haunching sieve analysis specifications
QC-11-3118, Lift height, number of passes, equipment used
QC-11-3401, Backfill material for Radwaste line bedding, haunching and initial fill

Receipt Inspection Reports

QC-RIR-10-9381
QC-RIR-07-115
QC-RIR-10-9474
QC-RIR-11-26894

Vendor Documents
MOX Services Document No. 08716_00002766_00001_230_A, Pneumatic Testing Procedure (Pipe & Tube Leak Testing)
MOX Services Document No. 08716_00002766_00002-0077_D, NPG/NPH Conformance Test Procedure (JSP-MOX-17)

Miscellaneous Documents

DCS01-UFJ-DS-CCT-M-12000-4, Specification for Ball Valves
DCS01-ZMJ-DS-CGD-M-65964-6, Commercial Grade Item Evaluation of S0403 (304L), S31603 (316L), Incoloy 800H, Titanium Grade 2, Carbon Steel and Zirconium R60702 Metallic Standard Forms Used in Fluid Transport System Applications
DCS01-PSP-DS-NTE-M-22492-B, Pellet Storage Units (PSE, PSF, PSI, PSJ) Component Classification Summary

DCS01-PSI-MG-NOM-M-10001, BMP Level-01 Room B-134 & B-135 Scrap Pellet Storage Bill of Materials, Glovebox Storage Rack Assembly
URS Ultrasonic Certification Level I/II report for Employee # 49487
URS Certificate of Qualification for Level II UT-T for Employee # 32087
Supplier Deficiency Report X-VS-137-01
DCS01-ZMJ-DS-NTE-M-12758-0, Threaded Fastener Thread Locking Using Jam Nuts
DCS01-PML-DS-NTE-M-22487-B, Pellet Handling Unit (PML) Component Classification Summary

Standards

ASME NQA-1-1994 Edition: Quality Assurance Requirements for Nuclear Facilities, as revised by ASME NQA-1a-1995. American Society of Mechanical Engineers (ASME). January 19, 1996.
ASNT SNT-TC-1a, Recommended Practice – Guidelines for the Qualification and Certification of Nondestructive Testing Personnel, 1988 Edition.
ASME Boiler and Pressure Vessel Code Section V, Nondestructive Examination, Latest Edition
ASME Boiler and Pressure Vessel Code Section IX, Welding and Brazing Qualifications, Latest Edition