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

August 6, 2010

Mr. Kelly D. Trice
President and Chief Operating Officer (Acting)
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. 70-3098/2010-002 AND NOTICE OF VIOLATION

Dear Mr. Trice:

During the period of April 1 through June 30, 2010, the US Nuclear Regulatory Commission (NRC) completed inspections of construction activities related to the construction of the Mixed Oxide Fuel Fabrication Facility. The purpose of the inspections was to determine whether activities authorized by the construction authorization were conducted safely and in accordance with NRC requirements. The enclosed inspection report documents the inspection results. At the conclusion of the inspections, the findings were discussed with those members of your staff identified in the enclosed report.

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

Based on the results of these inspections, four violations of NRC requirements were identified regarding the (1) failure to identify adverse conditions where both minimum and maximum clear cover deficiencies existed, but were not corrected prior to installation of formwork; (2) improper removal of design requirements related to testing the adequacy of compaction activities; (3) welding process control problems; and (4) failure to verify critical characteristics of materials and components. The violations were evaluated in accordance with the NRC Enforcement Policy available on the NRC's Web site at www.nrc.gov. The violations are cited in the enclosed Notice of Violation (Notice) and are being cited in the Notice because they were identified by the NRC. The circumstances surrounding the violations are described in detail in the subject inspection report.

You are required to respond to this letter and should follow the instructions specified in the enclosed Notice when preparing your response. For your consideration, NRC Information

Notice 96-28, "SUGGESTED GUIDANCE RELATING TO DEVELOPMENT AND IMPEMENTATION OF CORRECTIVE ACTION," is available on the NRC's Web site.

The NRC will use your response, in part, to determine whether further enforcement action is necessary to ensure compliance with regulatory requirements.

In accordance with 10 CFR 2.390 of NRC's "Rules of Practice," a copy of this letter and its enclosures may be accessed through the NRC's public electronic reading room, Agency-Wide. Document Access and Management System (ADAMS) on the Internet at http://www.nrc.gov/reading-rm/adams.html. To the extent possible, your response should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the public without redaction.

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

Sincerely,

/RA/

Anthony D. Masters, (Acting) Chief
Construction Projects Branch 1
Division of Construction Projects

Docket No. 70-3098
Construction Authorization No.: CAMOX-001

Enclosures:
1. Notice of Violation
2. NRC Inspection Report 70-3098/2010-002 w/attachment

cc w/encls: (See next page)

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NAME	M. Shannon	W. Gloersen	KO'Donohue	JMoorman	MLesser		
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Letter to Kelly Trice from Anthony D. Masters, dated August 6, 2010.

SUBJECT: MIXED OXIDE FUEL FABRICATION FACILITY- NRC INSPECTION REPORT 70-3098/2010-002

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NOTICE OF VIOLATION

Shaw AREVA MOX Services
Aiken, South Carolina

Docket No. 70-3098
Construction Authorization No. CAMOX-001

During Nuclear Regulatory Commission (NRC) inspection activities conducted April 1 through June 30, 2010, violations of NRC requirements were identified. In accordance with the NRC Enforcement Policy, the violations are listed below:

A. Condition 3.A of NRC Construction Authorization No. CAMOX-001, Revision (Rev.) 2, dated June 12, 2008, authorizes, in part, the applicant to construct a plutonium processing and mixed oxide fuel fabrication plant, known as the Mixed Oxide Fuel Fabrication Facility located at the Department of Energy's Savannah River Site, in accordance with the statements, representations, and conditions of the MOX Project Quality Assurance Plan (MPQAP) dated March 26, 2002, and supplements thereto (MPQAP, Rev. 8, dated August 20, 2009).

   MPQAP, Section 16, Corrective Action, states in part, that conditions adverse to quality be promptly identified and corrected.

   MOX Project Procedure (PP) 3-6, Corrective Action Process, Section 3.3.1 requires, in part, that adverse conditions shall be promptly identified, evaluated, and corrected. PP 3-6, Section 3.5.1 further requires that MFFF personnel shall promptly identify and document problems, including adverse conditions.

   Contrary to the above, between June 10 and 11, 2010, the applicant failed to identify and correct conditions adverse to quality during quality control and field engineering inspections of the minimum and maximum concrete clear cover of installed rebar prior to installation of the formwork for MFFF walls BMP-W217 and BMP-W219/223.

This is a Severity Level IV violation (Supplement II) (70-3098/2010-002-001)

B. Condition 3.A of NRC Construction Authorization No. CAMOX-001, Rev. 2, dated June 12, 2008, authorizes, in part, the applicant to construct a plutonium processing and mixed oxide fuel fabrication plant, known as the Mixed Oxide Fuel Fabrication Facility located at the Department of Energy's Savannah River Site, in accordance with the statements, representations, and conditions of the MPQAP dated March 26, 2002, and supplements thereto (MPQAP, Rev. 8, dated August 20, 2009).

   The MPQAP, commits the applicant to the American Society of Mechanical Engineers (ASME) NQA-1-1994, Quality Assurance Requirements for Nuclear Facility Applications, including supplements and Part II as revised by the ASME NQA-1a-1995 Addenda for implementation of 10 CFR 50 Appendix B. Attachment I of the MPQAP, Part II Applicability to MOX Project, provides no exceptions to Subpart 2.5, Section 5: Inspection of Soils and Earthwork.

MPQAP, Section 3, Design Control, states, in part, that "Measures are established in MOX Services QA procedures to assure that applicable requirements are correctly translated by MOX Services into design documents."

Contrary to the above, on February 23, 2010, the applicant failed to translate applicable ASME/NQA-1-1994 requirements into construction specification DCS01-WRT-DS-SPE-B-09307, Section 02316-Excavation, Backfilling, and Compaction for Utilities, Quality Level 1a (IROFS), Rev. 2. Specifically, Engineering Change Request (ECR) 005683, Rev. 0 introduced and approved the option to eliminate the field density test requirement per ASTM D1556, which was required by NQA-1-1994, Subpart 2.5, Section 5, from construction specification DCS01-WRT-DS-SPE-B-09307, Rev. 2.

This is a Severity Level IV violation (Supplement II). (70-3098/2010-002-002)

C. Condition 3.A of NRC Construction Authorization No. CAMOX-001, Rev. 2, dated June 12, 2008, authorizes, in part, the applicant to construct a plutonium processing and mixed oxide fuel fabrication plant, known as the Mixed Oxide Fuel Fabrication Facility located at the Department of Energy's Savannah River Site, in accordance with the statements, representations, and conditions of the MPQAP dated March 26, 2002, and supplements thereto (MPQAP, Rev. 8, dated August 20, 2009).

MPQAP, Section 2.1.1 states, in part, that the MOX Project Quality Assurance Plan complies with 10 CFR 50, Appendix B, Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants, and applies to MOX Services, including subcontractors, who perform quality-affecting activities.

Title 10 of the Code of Federal Regulations (CFR) Part 50 Appendix B Criterion IX states: "Measures shall be established to assure that special processes, including welding, heat treating, and nondestructive testing, are controlled and accomplished by qualified personnel using qualified procedures in accordance with applicable codes, standards, specifications, criteria, and other special requirements."

MPQAP, Section 8.2.4, states, in part, that if codes, standards or specifications include specific identification or traceability requirements (i.e., identification or traceability of the item to applicable specification or grade of material; heat, batch, lot, part or serial number; or specified inspection, test or other records), then identification and traceability methods shall implement the requirements specified. MOX specification DCS01-ZMJ-DS-SPE-M-19113-4, Glovebox Shell Fabrication, Inspection and Test Requirements, Section 2.1.3 Material Certification, states, in part, that traceability of metals shall be provided through all phases of fabrication and to the end product.

MPQAP, Section 10.2, states, in part, that inspection activities are documented and controlled by instructions, procedures, drawings, checklists, travelers or other appropriate means. Documented inspection planning shall include identification of when, during the work process, inspections are to be performed for those characteristics. MPQAP, Section 5.2.2, Content of Implementing Documents, states, in part, implementing documents shall include the following information as appropriate to the work to be performed. Section 5.2.2.C requires a sequential description of the work to be performed (unless otherwise specified) including controls for altering the sequence of required inspections, tests and other operations.

Contrary to the above, prior to June 24, 2010, MOX Services failed to ensure that measures were established to assure that welding performed by its supplier was controlled and accomplished by qualified procedures. MOX Services failed to conform with specified technical and quality assurance (QA) requirements, as evidenced by the following examples:

1. The applicant failed to ensure that special processes such as welding used by its vendor performing quality-affecting activities were controlled and accomplished by qualified procedures in accordance with the applicable codes, standards, and specifications. Specifically, MOX Services' vendor performed tack welding on the base-plate of glovebox NBX1000 without using a procedure qualified to the requirements of American Welding Society D1.6: Structural Welding Code- Stainless Steel.

2. The applicant failed to ensure that its vendor provided traceability of metals during all phases of fabrication of glovebox NBY1000 as noted in the following examples:

   a) The weld map (which contains heat numbers and welder identification numbers) of Glovebox NBY1000 was found to be incorrectly filled out, in that a weld was completed and not signed off on the weld map, instead another weld number was signed off on the weld map but the weld had not yet been completed.

   b) The base plates of Gloveboxes NBX1000 and NBY1000 were symmetrical and without a marking on the base plate to identify a reference location, thus, an individual cannot correlate specific welds on the base plate accurately to those specified on the corresponding weld map.

3. The applicant failed to assure that its vendor used documented inspection planning during work activities on Quality Level 1 (QL-1) components, in that, work process documents did not contain sequential descriptions of the work to be performed, including the controls for altering the sequence of required inspections.

This is a Severity Level IV violation (Supplement II). (70-3098/2010-002-003)

D. Condition 3.A of NRC Construction Authorization No. CAMOX-001, Rev. 2, dated June 12, 2008, authorizes, in part, the applicant to construct a plutonium processing and mixed oxide fuel fabrication plant, known as the Mixed Oxide Fuel Fabrication Facility located at the Department of Energy's Savannah River Site, in accordance with the statements, representations, and conditions of the MPQAP dated March 26, 2002, and supplements thereto (MPQAP, Rev. 8, dated August 20, 2009).

   MPQAP, Section 7.1, states, in part, that MOX Services procurement of Quality Level 1 and Quality Level 2 material, equipment and services is controlled to assure conformance with specified technical and QA requirements and that evaluations of received items and services are performed, as necessary, upon delivery or completion to ensure requirements specified in procurement documents are met.

   MPQAP, Section 7.2.12.C.5, states, in part, that prior to release as a commercial grade item, the applicant shall determine that inspection and/or testing is accomplished as required, to assure conformance with critical characteristics and that documentation, as applicable to the item, was received and is acceptable.

Contrary to the above, prior to June 24, 2010, the applicant failed to perform or verify that the required inspection and/or testing were accomplished to assure conformance with critical characteristics. In addition, the applicant failed to perform evaluations of received items and services, as necessary upon delivery or completion, to ensure that requirements specified in procurement documents were met. The applicant also failed to determine that inspection and/or testing was accomplished as required, to assure conformance with critical characteristics and that documentation, as applicable to the item, was received and acceptable as evidenced by the following example:

1. MOX Services failed to specify and perform the necessary inspection and/or testing to verify that the S30403 (304L) material used to fabricate the KCB 3000/4000/7000, gloveboxes met the requirements of ASTM A240/240M, Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications. Specifically, MOX Services failed to adequately verify that the carbon content of the 304L material does not exceed 0.03% as specified in Table 1, Chemical Composition Requirements, of ASTM A240/240M. MOX Services specified the glovebox material (type/alloy/grade/class) as a critical characteristic for acceptance in Attachment B of DCS01-ZMJ-DS-CGD-M-65858-2, Commercial Grade Item Evaluation (CGIE) for Ferrous Steel Material for Gloveboxes and Subassemblies. MOX Services has implemented a positive material identification (PMI) program to measure the metallic content of materials (e.g., chromium, nickel, and manganese); however, PMI is not capable of measuring non-metallic compounds within materials such as carbon, sulfur and silicon. Due to this limitation, the use of PMI is not considered adequate to differentiate between S30400 (304) and S30403 (304L) stainless steel materials. Low carbon stainless steel (304L) is considered important to prevent the sensitization (corrosion) of the material that may arise as a result of welding during fabrication.

This is a Severity Level IV violation (Supplement II). (70-3098/2010-002-004)

Pursuant to the provisions of 10 CFR 2.201, Shaw AREVA MOX Services is hereby required to submit a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with a copy to the Regional Administrator, Region II, and a copy to the NRC Resident Inspector at the Mixed Oxide Fuel Fabrication Facility construction project, within 30 days of the date of the letter transmitting this Notice of Violation (Notice). This reply should be clearly marked as a “Reply to a Notice of Violation” and should include: (1) the reason for the violation, or, if contested, the basis for disputing the violation, (2) the corrective steps that have been taken and the results achieved, (3) the corrective steps that will be taken to avoid further violations, and (4) the date when full compliance will be achieved. Your response may reference or include previously docketed correspondence if the correspondence adequately addresses the required response. If an adequate reply is not received within the time specified in this Notice, an Order or Demand for Information may be issued as to why the authorization should not be modified, suspended, or revoked, or why such other actions as may be proper should not be taken. Where good cause is shown, consideration will be given to extending the response time.

If you contest this enforcement action, you should also provide a copy of your response to the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555-0001.

Because your response will be made available electronically for public inspection in the NRC Public Document Room (PDR), or from the NRC’s document system (ADAMS), which is

accessible from the NRC web site at http://www.nrc.fob/reading-rm/adams.html, to the extent possible, it should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the public without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request withholding of such material, you must specifically identify the portions of your response that you seek to have withheld, and provide in detail the bases for your claim of withholding (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information). If safeguards information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21.
In accordance with 10 CRR 19.11, you may be required to post this Notice within two working days. Dated at Atlanta, Georgia this 6th day of August 2010.

U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.:	70-3098
Construction Authorization No.:	CAMOX-001
Report No.:	70-3098/2010-002
Applicant:	Shaw AREVA MOX Services
Location:	Savannah River Site Aiken, South Carolina
Inspection Dates:	April 1 – June 30, 2010
Inspectors:	M. Shannon, Senior Resident Inspector, Construction Projects Branch 1 (CPB1), Division of Construction Projects (DCP), Region II (RII) B. Adkins, Resident Inspector, CPB1, DCP, RII A. Artayet, Senior Construction Inspector, Construction Inspection Branch 3 (CIB3), Division of Construction Inspection (DCI), RII J. Bartleman, Senior Construction Inspector, CIB3, DCI, RII J. Calle, Senior Construction Inspector, CIB3, DCI, RII R. Jackson, Senior Construction Inspector, Construction Inspection Branch 2 (CIB2), DCI RII C. Jones, Senior Construction Inspector, Construction Inspection Branch 1 (CIB1), DCI, RII C. Abbott, Construction Inspector, CIB2, DCI, RII T. Fanelli, Construction Inspector, CIB1, DCI, RII D. Harmon, Construction Inspector, CIB3, DCI, RII J. Heisserer, Construction Inspector, CIB3, DCI, RII N. Karlovich, Construction Inspector, CIB1, DCI, RII J. Seat, Construction Inspector, CIB2, DCI, RII E. Heher, Construction Inspector, CIB2, DCI, RII
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Approved by:	Anthony D. Masters, (Acting) Chief, CPB1, DCP

Enclosure 2

EXECUTIVE SUMMARY

Shaw AREVA MOX Services
Mixed Oxide (MOX) Fuel Fabrication Facility (MFFF)
NRC Inspection Report No. 70-3098/2010-002

Routine inspections were conducted by the resident inspectors from April 1 - June 30, 2010, and by regional specialists from March 29 - April 2, April 26 - 29, June 14 - 18, and June 21 - 25, 2010. The inspections involved the observation and evaluation of the applicant's programs for facility construction of principle structures, systems, and components (PSSCs) and included quality assurance (QA) activities related to design verification and documentation control; problem identification, resolution and corrective actions; structural concrete activities; geotechnical foundation activities; and vendor fabrication activities.

The inspections discussed in this inspection report include: PSSC-012 (Emergency AC Power System); PSSC-015 (Emergency DC Power System); PSSC-024 (Gloveboxes); PSSC-034 (Tornado Dampers); PSSC-036 (MOX Fuel Fabrication Building Structure (including vent stack)); PSSC-044 (Process Cell Exhaust System); and PSSC-053 (Waste Transfer Line). The inspections also included QA activities related to design verification and documentation control; and also included observations and evaluations of the applicant's mechanical design activities for construction activities associated with PSSC-024, PSSC-034, and PSSC-044; design controls for electrical and instrument design activities associated with PSSC-012, Emergency AC Power System, and PSSC-015, Emergency DC Power System; and design controls for civil engineering activities associated with PSSC-036, MFFF Building Structure and PSSC-053, Waste Transfer Line. The inspection evaluated a sample of verified and approved designs for electrical systems and components classified as Items Relied on for Safety (IROFS).

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), and applicable industry standards. This included, as applicable, material procurement, fabrication and assembly, testing and inspection, and records management. The inspections also focused on Shaw AREVA MOX Services' (MOX Services) oversight of subcontractor activities. The inspectors reviewed applicable portions of MOX Services' program to assess the adequacy of the program and whether it was effectively implemented. The inspectors reviewed procedures associated with problem identification and corrective actions to resolve previous problems with materials and components. The inspections identified the following aspects of the applicant's programs as outlined below.

Resident Inspection Program for On-Site Construction Activities (Inspection Procedure (IP) 88130)

Construction activities related to PSSC-036 and PSSC-053 as described in Table 5.6-1 of the MFFF CAR were adequately performed and included installations of embedded plates and ground cables, heavy lifts of equipment and supplies, verification of equipment placements by surveys, welding, non-destructive testing, and receipt of materials. These construction activities were performed in a safe and quality related manner and in accordance with procedures and work packages. No findings of significance were identified (Section 2).

Quality Assurance: Design and Documentation Control [Pre-licensing and Construction] (IP 88107)

Mechanical Design Review

For the sample reviewed, the applicant performed design and engineering activities related to PSSC-024, PSSC-034, and PSSC-044 in accordance with their specifications, procedures and MPQAP. For the documents reviewed, the translation of design basis requirements into procurement, construction and fabrication documents was controlled. No findings of significance were identified (Section 3.a).

Electrical Design Review

The review of design process controls determined technical requirements from the Basis of Design, the Construction Authorization Request, and committed standards were translated into design specifications, drawings, and design change packages. No findings of significance were identified (Section 3.b).

The implementation of the corrective action program as it applied to electrical and I&C design provided prompt identification and timely corrective actions for conditions adverse to quality. No findings of significance were identified (Section 3.b).

Civil Design Review

Design and document control activities and procedures related to Quality Level 1 activities were adequate and properly implemented. No findings of significance were identified (Section 3.c).

Control of Materials, Equipment, & Services (IP 88108)

The review of controls for communicating technical and quality requirements for purchased materials and services identified that controls were established in accordance with applicable requirements. No findings of significance were identified (Section 4).

Structural Concrete Activities (IP 88132)

Embedded plates were properly installed; cleanliness was adequate, concrete testing activities were adequate and concrete placement activities were appropriate for PSSC-036. No findings of significance were identified (Section 5.a).

Violation 70-3098/2010-002-001 was identified for failure to identify and correct improperly installed rebar prior to enclosure of wall panels (PSSC-036) (Section 5.b).

Field preparation of concrete test cylinders and temporary storage of the cylinders was adquate. No issues were identified concerning the field testing (slump, temperature, and air entrainment). Testing to date indicates that the concrete placed at the MFFF met design strength requirements (PSSC-036). No findings of significance were identified (Section 5.c).

Reviewed items related to structural concrete were in accordance with MOX Services MPQAP, and project procedures (PSSC-036). No findings of significance were identified (Section 5.d).

Geotechnical and Foundation Activities (IP 88131 and IP 88134)

A review of test data indicated that the waste transfer lines were properly buried with compacted engineered fill (PSSC-053) (Section 6.a).

Violation 70-3098/2010-002-002 was identified for failure to translate applicable design basis requirements into construction specification DCS01-WRT-DS-SPE-B-09307, Excavation, Backfilling, and Compaction for Utilities, Revision (Rev.) 2 (PSSC-053) (Section 6.b).

Mechanical Components (IP 88136)

For the sample reviewed, MOX Services performed design and engineering activities related to QL-1 gloveboxes (PSSC-024) in accordance with their specifications, procedures and the MPQAP (Section 7).

The applicant maintained the physical condition of the quality-related gloveboxes sampled through the use of proper handling, storage and control techniques of mechanical equipment. In addition, the applicant maintained the associated records and documentation for these quality-related gloveboxes. No findings of significance were identified (Section 7).

Electrical Components and Systems, (IP 88138)

The inspection of controls for receipt, handling, storage, and issuance of electrical components determined that the applicant verified materials met quality requirements; materials were protected against loss, damage, or degradation; and measures were established to prevent inadvertent use of unacceptable items. No findings of significance were identified (Section 8.a).

Quality Assurance audits and technical assessments of software design activities were comprehensive and provided verifications that technical and quality requirements were addressed during design activities. No findings of significance were identified (Section 8.b).

Problem Identification, Resolution, and Corrective Action (IP 88110)

The applicant had established a program and procedures that adequately implemented the corrective action program in accordance with the applicant's MPQAP. No findings of significance were identified (Section 9).

Vendor Oversight Activities (IPs 88106, 88107, 88108, 88109, 88111, 88115, 88136 and 55100)

Structural Welding (PSSC-024)

The applicant failed to provide adequate oversight of its vendor in that services were not controlled to assure conformance with specified technical and QA requirements related to Quality Level 1 (QL-1) scope of supply (PSSC-024, Gloveboxes). Several examples were identified of problems with MOX Services oversight of their vendor's special processes, specifically the Flanders welding process and welding activities. One finding was identified and is documented as Violation (VIO) 70-3098/2010-002-003: Welding Process Control Problems. Four examples were identified involving QL-1 components (PSSC-024):

- Unqualified Tack Welding
- Incorrectly Completed Welding Documentation
- Loss of Weld Traceability Control
- Inadequate QC Inspection Control

All other observed activities and reviewed documents in the area of welding related to PSSC-024 as described in Table 5.6-1 of the MFFF Construction Authorization Request were performed adequately. These fabrication activities were performed in a safe and quality related manner and in accordance with procedures and work packages in accordance with the applicant's MOX Project Quality Assurance Plan (MPQAP). (Section 10.a)

Quality Assurance Program Development and Implementation

The roles, responsibilities, and programmatic interfaces of the various functional areas of the project were adequate. The QA Program provided adequate information pertaining to fabrication activities associated with the PSSCs. The applicant and its vendor developed, maintained and implemented an adequate QA program in accordance with the applicant's Construction Authorization No. CAMOX-001 and approved MPQAP, Revision (Rev.) 8. No findings of significance were identified (Section 10.b).

Design and Documentation Control (PSSC-024)

Design and document control activities and procedures were adequate and properly implemented. The vendor had developed, maintained and implemented an adequate design and document control program in accordance with the applicant's Construction Authorization No. CAMOX-001 and approved MPQAP (Section 10.c).

Control of Materials, Equipment, and Services (PSSC-024)

The applicant and its vendor maintained adequate control of materials, equipment and services related to the QL-1 gloveboxes. The applicant's vendor maintained and implemented proper handling, storage and control of QL-1 equipment and material in its possession at the vendor's facility, except as noted in the following finding. Activities reviewed by the inspectors for the acceptance and control of purchased items and services determined that applicable requirements were not met because the commercial grade dedication (CGD) process for QL-1 components and materials did not provide reasonable assurance that commercially procured materials met all the critical characteristics associated with that specified material. One finding was identified and is documented as VIO 70-3098/2010-002-004: Failure to Verify Critical Characteristics of Materials and Components (PSSC-024) (Section 10.d).

Inspection, Test Control & Control of Measuring Equipment (PSSC-024)

Activities conducted at the vendor's facilities associated with inspection, test control, and control of measuring and test equipment (M&TE), were performed in accordance with the MPQAP. The inspectors performed document reviews and personnel interviews to access the vendor's process to inspect, maintain control over tests, and M&TE. The applicant maintained and performed adequate oversight of its vendor in these areas. Flanders performed adequate inspections, testing and control of M&TE related to the QL-1 equipment and fabrication activities (PSSC-024) (Section 10.e).

10 CFR 21 Inspection – Facility Construction

The applicant's vendor adequately established procedures and program activities that effectively implemented the requirements of 10 CFR Part 21. MOX Services' vendor adequately implemented the provisions of the MPQAP for 10 CFR Part 21, with regard to: postings, identifying its applicability in procurement documents, identifying deviations, and reportability requirements. No findings of significance were identified (Section 10.f).

Supplier/Vendor Inspection (PSSC-024)

The applicant and its vendor implemented the MPQAP requirements for the control of special processes, such as: welding, weld defect repair, nondestructive examination (NDE) procedures, NDE personnel qualification and certification. The applicant and its vendor complied with the applicable quality and technical requirements established by the MPQAP, MFFF construction specifications, and applicable ASME NQA-1 requirements. No findings of significance were identified (PSSC-024) (Section 10.g).

Mechanical Components (PSSC-024)

The applicant provided adequate design and procurement requirements for its vendor to construct and fabricate the QL-1 gloveboxes associated with PSSC-024. MOX Services design and procurement specifications and requirements along with Flanders fabrication of the QL-1 IROFS gloveboxes was in accordance with Construction Authorization No. CAMOX-001, Revision 2, dated June 12, 2008. The applicant's glovebox technical requirements were adequately detailed in design and procurement specifications, drawings, and work procedures (Section 10.h).

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REPORT DETAILS

1. Summary of Facility Status

During the period, the applicant continued construction activities of principle structures systems, and components (PSSCs). Construction activities continued related to Release 2, 3A and 3B activities which included multiple inside and outside walls and various elevated floors of the Mixed Oxide (MOX) Process Building (BMP), Aqueous Polishing Building (BAP), and the Shipping Receiving Building (BSR). The Mixed Oxide Fuel Fabrication Facility (MFFF) project continued installation of Quality Level (QL) QL-1 tanks during this inspection period. Approximately 26 tanks have been installed to date. Thirty-three tanks are presently stored in the Process Assembly Facility. The applicant has also started application of coatings on the walls and ceilings of the BMP and BAP lower level rooms and hallways. Other construction activities included civil installation of waste process lines, installation of process piping and supports in the BAP, and installation of ventilation system supports in the BAP.

2. Resident Inspection Program for On-Site Construction Activities (Inspection Procedure (IP) 88130)

a. Routine Inspection Activities

(1) Scope and Observations

During the inspection period, the inspectors observed the following activities associated with PSSC-036 (MOX Fuel Fabrication Building Structure (MFFBS) (including vent stack)) and PSSC-053 (Waste Transfer Line) as described in Table 5.6-1 of the MFFF Construction Authorization Request (CAR):

(a) Installation of structural reinforcing steel in the BMP, the BAP, and BSR;
(b) Installation of embedded piping, embedded support plates, and plant grounding system in all three buildings;
(c) Concrete placements in walls and floors of the BMP, BAP, and BSR;
(d) Operation of the concrete batch plant;
(e) Receipt of cement, fly ash, sand and gravel;
(f) Concrete testing in the field (slump, air entrainment, and temperature);
(g) Installation of building grounding cables in various floors and walls;
(h) Surveys (proper positioning/location) of embedded piping and embedded plates;
(i) Cleanliness of areas prior to concrete placement, and maintenance of cleanliness during the concrete placements;
(j) Lifting and installation of QL-1 tanks;
(k) Installation of coatings in the BAP and BMP;
(l) Assembly of gloveboxes and associated equipment in the assembly building;
(m) Installation of waste transfer lines from BAP to waste process facility;
(n) Installation of process piping and supports in the BAP;
(o) Installation of ventilation system supports in the BAP.

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 MOX Project Quality Assurance Plan (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 Quality Assurance (QA) programmatic requirements. Specifically, the inspectors verified that installations were in accordance with applicable field drawings and met the general construction notes detailed on the following drawings: (1) MOX Fuel Fabrication Facility, Concrete and Reinforcing General Notes, DCS01-01352, Revision (Rev.) 9 (Sheet 1 of 2); and (2) MOX Fuel Fabrication Facility, Concrete and Reinforcing General Notes and Tolerance Details, DCS-01352, Rev. 6 (Sheet 2 of 3) and Rev. 0 (Sheet 3 of 3).

The inspectors routinely attended the applicant's construction plan-of-the-day meetings and civil restraints meetings. The inspectors routinely held discussions with Shaw AREVA MOX Services' (MOX Services) civil engineers, field engineers, quality control/assurance personnel, batch plant personnel, Titan steel workers, Baker Construction, and Alberici 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 maintained at each work site. The inspectors monitored the status of work package completion to verify construction personnel obtained proper authorizations to start work, monitor progress and to ensure work packages were kept up-to-date as tasks were completed.

The inspectors routinely verified that adequate staffing was available for construction activities, 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, noted adequate cleanliness of the construction areas, and noted that hazardous materials were properly stored and/or properly controlled when in the field.

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); and reviewed the closure of selected NCRs and CRs. The inspectors concluded that the applicant was appropriately identifying conditions adverse to quality in their corrective action system. The applicant identified these items during routine daily activities, special inspections, audits, and self assessments. The applicant routinely evaluated the significance of the adverse conditions, completed corrective actions in a timely manner, and properly evaluated adverse conditions for applicable reporting requirements. The inspectors noted that the applicant entered issues identified during self assessments into the corrective action system.

(2) Conclusions

Construction activities related to PSSC-036 and PSSC-053 as described in Table 5.6-1 of the MFFF CAR were adequately performed and included installations of embedded plates and ground cables, heavy lifts of equipment and supplies, verification of

equipment placements by surveys, welding, non-destructive testing, and receipt of materials. These construction activities were performed in a safe and quality related manner and in accordance with procedures and work packages. No findings of significance were identified.

3. Quality Assurance: Design and Documentation Control [Pre-licensing and Construction] (IP 88107) (PSSC-24, 34, 44)

a. Mechanical Design Review

(1). Scope and Observations

The inspectors reviewed engineering design, procurement, and additional documentation associated with gloveboxes (PSSC-024), tornado dampers (PSSC-034), and process cell exhaust system (PSSC-044) to confirm compliance with QA programmatic requirements, industry standards and NRC regulations. For a sample of components from PSSCs -024, -034 and -044, the inspectors reviewed the basis of design (BOD), the system design descriptions, design drawings, procurement specifications, and construction specifications, as applicable, to determine if the hierarchy of documents included the appropriate licensing, QA, and CAR requirements.

Specifically, the inspectors reviewed generic glovebox (PSSC-24) design documents, design documents specific to the Homogenization, Sampling and Filling Unit KCB (KCB*GB2000*GB3000*GB4000*GB7000), Scrap Box Loading Unit (PAR), and Pellet Repackaging Unit (PAD) gloveboxes, and a sample of approved shop fabrication drawings for the PAD and PAR gloveboxes to verify that the documents were consistent with the CAR.

The inspectors reviewed commercial-grade dedication (CGD) plans and packages associated with glove port and bag port assemblies to confirm that the applicant adequately defined and verified critical characteristics in accordance with the design and applicable procedures. These glove port and bag port assemblies were applicable to multiple glovebox designs.

The inspectors reviewed the design criteria established in the BOD for QL-1 HVAC systems, which defined the requirements for the design of HVAC and dynamic confinement systems for the MFFF, including tornado dampers (PSSC-34) and the process cell exhaust system (PSSC-44), to verify conformance to the CAR. For PSSC-44, the inspectors specifically reviewed two components, fire dampers and HEPA filters, to verify conformance to the CAR. The inspectors reviewed the purchase specifications for tornado dampers and HEPA filters to verify that design and code requirements described in the BOD, including ANSI/ASME AG-1 Code on Nuclear Air and Gas Treatment, were incorporated.

The inspectors reviewed the purchase order for American Warming & Ventilating (AWV) to verify that the appropriate specifications and regulatory requirements, including 10 CFR 50 Appendix B and 10 CFR 21, were referenced. The inspectors reviewed the approved suppliers list (ASL) to confirm that AWV was listed. The inspectors reviewed the applicant's audit of AWV to verify that the 18 point criteria of 10 CFR 50 Appendix B were addressed and that any restrictions placed on AWV were controlled in accordance with the applicant's processes. The inspectors reviewed the equipment seismic qualification specification that will be implemented by AWV.

The inspectors reviewed the procurement specifications and applicable ECRs for the fire dampers and the HEPA filters to verify that the appropriate design requirements from the CAR and the BOD documents and quality assurance requirements from the MPQAP were incorporated. The inspectors also reviewed the construction specification for HVAC erection to determine if the requirements from higher tier documents, such as the MPQAP and BOD, were incorporated.

(2) Conclusions

For the sample reviewed, the applicant performed design and engineering activities related to PSSC-024, PSSC-034, and PSSC-044 in accordance with their specifications, procedures and MPQAP. For the documents reviewed, the translation of design basis requirements into procurement, construction and fabrication documents was controlled. No findings of significance were identified.

b. Electrical Design Review

(1) Design Control

(a) Scope and Observations

The inspectors reviewed applicant commitments for design basis, quality assurance, and management measures to assure regulatory requirements were adequately included in the design and procurement of electrical PSSCs and IROFS. In addition, inspectors evaluated the implementation and effectiveness of the applicant's corrective action program as related to electrical design activities.

The inspectors evaluated five finalized specifications and supporting design documents associated with PSSC-012, Emergency AC Power System, and PSSC-015, Emergency DC Power System. The design documents had been issued to define requirements for emergency diesel generators, electrical power distribution control panels, emergency motor control centers, fiber-optic cable, and dry-type transformers. The inspectors reviewed technical proposals, technical evaluations, final technical reviews, program procedures, procurement specifications, engineering change requests (ECRs), design change requests (DCRs), and CRs that were associated with electrical design. Inspectors conducted interviews with responsible personnel and performed direct observations of design activities.

The inspectors verified that the design documents incorporated applicable design basis requirements, license application commitments, and the MFFF Basis of Design. Documents were prepared, verified, approved, and controlled in accordance with NRC requirements and the MPQAP. Changes to the documents had been controlled in a manner equivalent to the original design.

(b) Conclusions

The review of design process controls determined technical requirements from the Basis of Design, the Construction Authorization Request, and committed standards were translated into design specifications, drawings, and design change packages. No findings of significance were identified.

(2) Follow-up Review of IFI Status and Verification of Applicant Response to NOV

(a) Scope and Observations

The inspectors conducted a follow-up review of an engineering load calculation for the 125 VDC batteries. Inspection Report 70-3098/2009-002 identified that the calculation failed to correctly characterize the battery system losses and contained non-conservative acceptance criteria. Due to changes being considered for the battery design, the inspectors opened Inspection Follow-up Item (IFI) 70-3098/2009-002-004 to evaluate the final configuration. On April 1, 2010, inspectors found a new battery configuration was still under development. The calculation did not yet include a loading analysis for the pending change. The inspectors determined that IFI 70-3098/2009-002-004 was not ready for follow-up inspection and will remain open in this inspection report.

On March 29, 2010, the inspectors conducted a follow-up review of violation (VIO) 70-3098/2009-002-002 for failure to correctly translate design basis requirements into engineering drawings and specifications. Four examples of the condition were identified in VIO 70-3098/2009-02-02. The inspectors' review of revised procedures, training records, the revised Electrical Basis of Design, and updated specifications and drawings verified corrective actions had been effectively implemented for examples number 1, 2, and 4. However, violation example number 3, which cited errors in an engineering drawing for vital power inverters, was not corrected. Inspectors noted the applicant's response to the Notice of Violation, dated August 27, 2009, asserted "Full compliance was achieved on August 20, 2009. Corrective actions for the items identified in the VIO have been completed." The inspectors found the revised drawing and an associated specification for the vital power inverters failed to specify a maintenance bypass switch configuration which would assure power would not be interrupted when the switch is actuated. Also, the specification had not been finalized and was awaiting a final technical review. The inspectors concluded that the documents were not adequately corrected. However, since the revised specification had not yet been approved, this is considered work-in-progress, and therefore a minor issue that does not warrant enforcement.

The applicant initiated Condition Report CR-10-177 to evaluate and correct the incorrect response to VIO 70-3098/2009-002-002. Therefore, VIO 70-3098/2009-002-002 remains open in this inspection report.

(b) Conclusions

Actions taken by the applicant to address NOV 70-3098/2009-002-002 for inadequate design control were incomplete and had not been finalized. In a letter from MOX Services to the NRC, dated May 18, 2010, the applicant indicated that their actions to correct the violation were still in process.

(3) Corrective Action Program

(a) Scope and Observations

The inspection of design activities included a review of the implementation of the corrective action program, which included a sample of approximately 15 CRs and 22 ECRs related to electrical design. The inspectors verified the selected corrective action documents implemented the requirements of procedures PP9-21, Engineering

Change Requests, and PP3-6, Corrective Action Process. The inspectors confirmed corrective actions were consistent with identified conditions, significance was properly assessed, and completions of actions were timely as defined by applicant's procedures. The inspection of the corrective action process included interviews with personnel from Engineering and Quality Assurance.

(b) Conclusions

The implementation of the corrective action program as it applied to electrical and I&C design provided prompt identification and timely corrective actions for conditions adverse to quality. No findings of significance were identified.

(c) Civil Design Review

(1) Scope and Observations

This inspection was conducted to verify that design and document control measures were implemented in accordance with the MPQAP, Rev. 8. This was accomplished through document review and discussions with MOX Services personnel. The inspectors reviewed the applicant's Project Procedures (PP) for design and document control of Quality Assurance records, NCRs and ECRs.

During the inspection, the inspectors sampled civil design related NCRs and ECRs to verify adequate disposition and engineering evaluation. The inspectors specifically reviewed NCR-EN-10-1733, NCR-QC-10-1768, ECR-006190, ECR-003224, ECR-003281, and design documents related to these records. The inspectors also reviewed MOX Services PP9-21, Engineering Change Request, Rev. 7, and PP3-5, Control of Nonconforming Items, Rev. 6. These procedures were used to verify the adequacy of the evaluation and documentation of NCRs and ECRs. No findings of significance were identified.

(2) Conclusion

Design control and documentation activities were performed in accordance with MOX Services MPQAP, and project procedures. No findings of significance were identified.

4. Control of Materials, Equipment, & Services (IP 88108)

(1) Scope and Observations

The inspectors conducted a review of the applicant's technical and quality commitments to verify applicable requirements were communicated to suppliers in procurement documents associated with PSSC-012, Emergency AC Power System. A sample of five procurement specifications was reviewed to verify that committed technical and quality requirements were incorporated.

During the review, the inspectors verified that design basis requirements were adequately incorporated into finalized procurement specifications of the following QL-1 electrical components:

- Specification for Emergency Diesel Generators, DCS01-EEJ-DS-SPE-E-25236-0
- Specification for Fiber Optic Cable, DCS01-EEJ-DS-SPE-E-25106-2

- Specification for 480V Dry Type Transformers, DC01-EEJ-DS-SPE-E-25118-3
- Specification for Emergency Motor Control Centers, DCS01-EEJ-DS-SPE-E-25202-0
- Specification for Emergency Power Distribution Control Panels, DCS01-EEJ-DS-SPE-E-25332-0

The inspectors verified that technical requirements from the Electrical Basis of Design, the Construction Authorization Request, and committed standards were translated into the procurement specifications. The inspectors review included interviews with MFFF engineering and procurement staff. The inspectors examined technical documents in supplier submittals and supplier deviation requests to verify the approved dispositions were consistent with the procurement specifications.

The inspectors verified that the suppliers selected to provide the purchased items were shown on the ASL, and that suppliers had been audited for the services they had been approved to perform. The inspectors noted a hold had been appropriately established for one commercial grade supplier pending implementation of an audit of the supplier's technical and quality capabilities. The inspectors confirmed that the development and control of procurement specifications were consistent with the applicant's governing procedures.

(2) Conclusions

The review of controls for communicating technical and quality requirements for purchased materials and services identified that controls were established in accordance with applicable requirements. No findings of significance were identified.

5. Structural Concrete Activities (IP 88132)

a. Resident Inspector Review of Concrete Placement Activities (PSSC-036)

(1) Scope and Observations

The inspectors evaluated the adequacy of ongoing concrete activities conducted by Baker, Alberici, Soil and Materials Engineers, Inc. (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 MFFBS. Table 5.6-1 of the CAR specifies the MFFBS as PSSC-036.

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; verified cleanliness of the placement area; observed placement of embedded piping, installation of piping supports, mounting of piping to supports, and installation of galvanic sleeves between piping and supports. 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 and observed MOX Services' field engineers and quality control (QC) personnel performing inspections of the

reinforcing steel, embed plates, embed piping, cleanliness prior to placements, and detailed observations of the placements.

During the concrete placements, the inspectors observed operations at the batch plant and at the point of placement. Concrete placement and onsite testing activities were in accordance with procedural requirements. The inspectors noted that any observed deficiencies during the placements were independently identified by on-going QC inspections and corrected by the applicant.

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, and that the concrete test cylinders were collected and temporarily stored per procedure prior to transport to the off-site materials laboratory (S&ME) for curing and later testing. The inspectors noted that the storage containers were properly heated for cold weather storage. Batch plant operators correctly implemented procedural requirements and were in constant communication with the concrete placement crews.

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

April 1, 2010, BMP Gabion Wall W-1.1, 149 cubic yards
April 6, 2010, BMP W-126/128B.2, BMP Interior Wall, 69 cubic yards
April 7, 2010, BMP W-123A.6/128B.1, BMP Interior Wall, 84 cubic yards
April 9, 2010, BMP F-224, BMP Elevated Floor, 70 cubic yards
April 9, 2010, BSR F-120.2, BSR Elevated Floor, 232 cubic yards
April 15, 2010, BMP W-303, BMP Interior Wall, 168 cubic yards
April 16, 2010, BMP W-219A.3, BMP Interior Wall, 26 cubic yards
April 16, 2010, BAP W-109.2, BAP Interior Wall, 145 cubic yards
April 16, 2010, BMP F-219, BMP Elevated Floor, 178 cubic yards
April 20, 2010, BMP F-116.C, BMP Elevated Floor, 133 cubic yards
April 21, 2010, BMP W-128 B.4/123 A.7, BMP Interior Wall, 49 cubic yards
April 21, 2010, BMP F-166C, BMP Elevated Floor, 23 cubic yards
April 23, 2010, BMP Gabion Wall-1.7, 106 cubic yards
April 23, 2010, BMP W-223 A.1, BMP Interior Wall, 58 cubic yards
April 23, 2010, BMP W-219 A.4, BMP Interior Wall, 54 cubic yards
April 27. 2010, BMP W-217.7/218.5, BMP Interior Wall, 110 cubic yards
April 28, 2010, BMP F-303/304, BMP Elevated Floor, 343 cubic yards
April 28, 2010, BMP Gabion Wall, 53 cubic yards
April 30, 2010, BSR F-118/119, BSR Elevated Floor, 174 cubic yards
April 30, 2010, BAPW-110.3, BMP Interior Wall, 164 cubic yards
April 30, 2010, BMP W-218.4/216.3, BMP Interior Wall, 94 cubic yards
April 30, 2010, BMP W-313.1, BMP Interior Wall, 63 cubic yards
May 6, 2010, BMP W-219 A.7/219 A.6, BMP Interior Wall, 17 cubic yards
May 6, 2010, BSR Gabion Wall 1.2.2, 32 cubic yards
May 6, 2010, BAP F-138/140, Topping Slabs, 4 cubic yards
May 7, 2010, BMP W-219 A.5, BMP Interior Wall, 12 cubic yards
May 7, 2010, BMP W-126 B.4, BMP Interior Wall, 44 cubic yards
May 13, 2010, BMP W-128.5/126 A.6.2, BMP Interior Wall, 19 cubic yards
May 13, 2010, BMP W-127 A.5, BMP Interior Wall, 23 cubic yards
May 13, 2010, BMP F-119.2, BMP Elevated Floor, 167 cubic yards
May 13, 2010, BMP W-305, BMP Interior Wall, 295 cubic yards
May 13, 2010, BMP W-313.2, BMP Interior Wall, 23 cubic yards

May 14, 2010, BMP F-218.6/216.4, BMP Interior Wall, 95 cubic yards
May 18, 2010, BAP W-108 A.4/109.1.2, BAP Interior Wall, 189 cubic yards
May 19, 2010, BAP Topping Slab 151, 11 cubic yards
May 20, 2010, BMP F-303.1/304.1, BMP Elevated Floor, 230 cubic yards
May 20, 2010, BMP W-304/306, BMP Interior Wall, 270 cubic yards
May 25, 2010, BSR W-103.7.2, BSR Interior Wall, 50 cubic yards
May 26, 2010, BMP W-218.7, BMP Interior Wall, 128 cubic yards
May 27, 2010, BSR Gabion Wall 5, 78 cubic yards
May 27, 2010, BMP F-305, BMP Interior Wall, 310 cubic yards
June 4, 2010, BMP F-210.2/212.2, BMP Elevated Floor, 242 cubic yards
June 10, 2010, BMP W-314.1, BMP Interior Wall, 65 cubic yards
June 25, 2010, BMP W-208, BMP Interior Wall, 154 cubic yards
June 26, 2010, BMP F-306, BMP Elevated Floor, 116 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, work package reviews and routinely performed walk downs of the area to verify adequate cleanliness prior to concrete placement.

During the inspection period, the inspectors evaluated the adequacy of ongoing structural concrete activities conducted by Baker Concrete Construction Inc., Alberici Construction, S&ME, and MOX Services. This inspection focused primarily on steel reinforcement storage and handling, steel reinforcement specifications, and the concrete testing laboratory. MOX Services' Construction Specification, DCS01-BKA-DS-SPE-B-09328-3, Section 03201, Concrete Reinforcement for Quality Level 1a (IROFS), 2, 3, and 4, Rev. 3, and DSC01-BKA-DS-SPE-B-09330-4, Section 03301, Placing Concrete and Reinforcing Steel for Quality Level 1, 2, 3, and 4, Rev. 4, were reviewed for adequacy. QA documentation and implementation procedures were also reviewed by the inspectors to verify whether activities performed onsite were in accordance with internal procedures, specifications and NRC regulations.

(2) Conclusions

The inspectors concluded that embedded plates were properly installed; cleanliness was adequate, concrete testing activities were adequate and concrete placement activities were appropriate (PSSC-036). No findings of significance were identified.

b. Rebar Installation (PSSC-036)

(1) Scope and Observations

This portion of the inspection focused on the structural concrete activities associated with safety related construction of PSSC-036. The intent of the inspection was to determine, by direct observation and independent evaluation, whether work and inspection performance related to the QL-1 structural concrete construction activities were accomplished in accordance with design specifications, drawings, procedures, and regulatory requirements. The inspection focused on reinforcing steel installation in BMP wall placements W-217 and W-223/219.

The inspectors performed inspections of the BMP walls prior to closure on June 9 and 10, 2010. The inspectors noted several instances where rebar placement did not meet

clear cover requirements for both minimum clear cover (less than one inch) and maximum clear cover (greater than four inches to the vertical bars). The inspectors noted that MOX QC personnel had not identified the out of tolerance condition of the rebar prior to installation of the forms. MOX management was notified of the adverse condition on June 11, 2010, and further placement activities were put on hold until the conditions could be repaired.

MPQAP, Section 16, Corrective Action, requires that conditions adverse to quality be promptly identified and corrected. Contrary to this requirement, on June 10 and 11, 2010, conditions adverse to quality were not promptly identified in that rebar location in placements BMP W-217 and BMP W223/219 did not meet ACI-349 Code requirements for minimum and maximum clear cover prior to closure of the forms. The failure to identify that the rebar placement did not meet ACI-349, Code Requirements for Nuclear Safety-Related Concrete Structures and Commentary, Sections 7.5.2 and 7.7.1 is considered to be a violation (VIO) and is identified as VIO 70-3098/2010-002-001, Failure to Identify Rebar Installations that did not Meet Clear Cover Requirements. This issue was placed in the applicant's corrective action system as Condition Report CR-10-284.

(2) Conclusion

A violation (70-3098/2010-002-001) was identified for failure to identify and correct improperly installed rebar prior to enclosure of wall panels (PSSC-036).

c. Concrete Testing (PSSC-036)

(1) Scope and Observations

During this inspection period, the inspectors observed the field testing of the concrete prior to placement and the field preparation of the concrete compressive test cylinders. No issues were identified concerning the field testing (slump, temperature, and air entrainment) and no significant issues were identified concerning storage of the cylinders prior to testing. The cylinder storage containers were observed to be properly controlled for the weather conditions. The inspectors reviewed the Concrete Statistical Summaries used to trend the results of the compressive test of the concrete cylinder specimens. The summaries indicated that the concrete installed at the MFFF met the design strength requirements.

(2). Conclusions

Field preparation of concrete test cylinders and temporary storage of the cylinders was acceptable. No issues were identified concerning the field testing (slump, temperature, and air entrainment). Testing to date indicates that the concrete placed at the MFFF met design strength requirements (PSSC-036). No findings of significance were identified.

d. Region Based Review of Concrete Placement Activities (PSSC-036)

(1) Scope and Observations

Inspection activities included a review of the concrete batching facility. Both batch plants and all concrete delivery vehicles at the facility had current National Ready Mix Concrete Association certifications as required by PP11-5, Batch Plant Testing and Calibration,

Rev. 1. The inspectors verified that scales, admixture/batching controls and concrete truck water metering equipment were calibrated as required by PP11-5. Inspectors observed the storage conditions of aggregate, cementitious materials, admixtures, water, and ice to verify conformance with construction specification DSC01-BKA-DS-SPE-B-09325-4, Mixing and Delivering for Quality Level QL-1a (IROFS) and QL-2 Concrete, Rev. 4. Inspectors also verified that concrete constituent conformance tests were performed as required. Inspectors reviewed receipt inspection documentation, including Cement Material Certification Reports and Fly Ash Material Test Reports, to verify conformance with construction specifications. The inspectors reviewed concrete batch tickets to verify documentation of appropriate mix design, volume, date, time, and location of placement.

The inspectors observed activities at the off-site Independent Testing Laboratory (ITL) operated by S&ME. S&ME is the contracted independent testing laboratory that performs fresh concrete and compressive strength testing for MOX Services. The inspectors observed two concrete cylinder compressive strength tests performed in accordance with the ASTM C 39 Standard. The results of the observed compressive strength tests met the requirements of construction specification DSC01-BKA-DS-SPE-B-09325-4, Mixing and Delivering for Quality Level QL-1a (IROFS) and QL-2 Concrete, Rev. 4. The inspectors reviewed receipt documentation and testing results for capping compound used to prepare concrete cylinders for compressive strength testing. The inspectors also reviewed S&ME training and qualification records, testing laboratory certifications, and equipment calibration logs. The inspectors did not identify any concerns with the reviewed documents.

The inspectors reviewed WP 10888-C-2697-BMP-W208-C, Release III Exterior Wall, Installation of Forms, Embedded Items, Rebar and Concrete, QL-1; vendor drawing Condor 4010, Rev.1; and Concrete Placement Pre-Pour Checklist for WP 09-10888-C-2697-BMP-W208-C. The inspectors interviewed personnel and observed the QC final inspection for pour W208 to determine whether activities were being performed in accordance with regulatory requirements. No items of safety significance were identified.

(2) Conclusion

The inspectors concluded that reviewed items related to structural concrete were in accordance with MOX Services MPQAP, and project procedures. No findings of significance were identified.

6. Geotechnical and Foundation Activities (IP 88131 and IP 88134)

a. Resident Review of Waste Process Line Backfill Test Records

(1) Scope and Observations

The inspection focused on the applicant's implementation of QL-1 geotechnical and foundation activities associated with PSSC-053 Waste Transfer Line. By document review and discussions with personnel performing activities related to the QL-1 activity, the inspectors were able to determine whether activities were accomplished in accordance with design specifications, drawings, procedures, and regulatory requirements.

During the inspection, the inspectors reviewed test reports associated with compaction of the engineered backfill located under and around the waste transfer lines. Approximately 170 cubic yards of engineered fill were used to complete the backfill evolution. Approximately 38 compaction tests were completed to ensure proper compaction. All of the test data indicated that the lines were properly buried.

(2) Conclusion

A review of test data indicated that the waste transfer lines were properly buried with compacted engineered fill.

b. Region Based Review of Compaction Activities

(1) Scope and Observations

The inspectors reviewed documents related to geotechnical and backfilling activities such as specifications, ECRs, and work packages to verify compliance with the technical and regulatory requirements.

The inspectors reviewed documentation and observed backfilling activities associated with PSSC-053, Waste Transfer Line. Work Package (WP) 09-10888-B2272-C-0013, Excavation and Backfilling of Rad Waste Piping, and applicable MOX Services construction specification DCS01-WRT-DS-SPE-B-09307, Excavation, Backfilling, and Compaction for Utilities, Rev. 2 were reviewed.

The inspectors visited the MOX Services Independent Testing Laboratory (ITL), operated by S&ME, to review documentation related to soils testing. The inspectors reviewed a sample of test results for field testing performed on Quality Level-1 (QL-1) backfill material for the radiological waste line under American Society of Testing and Materials (ASTM) standards D1557, D422 and D2922. The inspectors also interviewed S&ME personnel to verify compliance with contract and quality assurance requirements.

On June 14, 2010, the inspectors reviewed ECR-005683, To Add Another Option for the Correlation of the Nuclear Gauge, Rev. 0, dated February 23, 2010. This ECR approved a change in the construction specification DCS01-WRT-DS-SPE-B-09307, Excavation, Backfilling, and Compaction for Utilities, Rev. 2 to provide the option of performing the field density test per ASTM D2922 (nuclear gauge test method) without having to correlate with the field density test per ASTM D1556 (sand cone test method). This is contrary to the requirements of ASME NQA-1-1994 Part II, Subpart 2.5, Section 5, Inspection of Soils and Earthwork. The inspectors noted that MOX Services was committed to this requirement without exceptions as stated in Attachment I of the MPQAP. This subpart of NQA-1-1994 requires field density in process tests per ASTM D1556 with the option to supplement with ASTM D2922 as specified. Therefore, ECR-05683, Rev. 0 did not adequately translate regulatory requirements to construction specification DCS01-WRT-DS-SPE-B-09307-2.

The MPQAP, Rev. 8, Section 3, Design Control, requires that applicable requirements are correctly translated into design documents. Contrary to this requirement, MOX Services did not correctly translate applicable requirements into a construction specification in that NQA-1-1994 requirements were not properly considered for the change implemented by ECR-005683, Rev. 0. The failure to correctly translate applicable regulatory requirements into the approved change for construction

specification DCS01-WRT-DS-SPE-B-09307, Rev. 2, on February 11, 2010, is considered to be a Violation (VIO) and is identified as VIO 70-3098/2010-002-002, Inadequate Construction Specification Change. This issue was captured in the applicant's corrective action program as 10888-MOX-CR-10-180, as updated on June 17, 2010.

(2) Conclusion

A violation was identified as VIO 70-3098/2010-002-002: Inadequate Construction Specification Change, for failure to correctly translate applicable requirements into the approved change for construction specification DCS01-WRT-DS-SPE-B-09307, Construction Specification, Section 02316-Excavation, Backfilling, and Compaction for Utilities, Quality Level 1a (IROFS), Rev. 2.

7. Mechanical Components (IP 88136) (PSSC-24)

a. Scope and Observations

The inspectors reviewed design engineering, procurement and receipt inspection activities, and documentation associated with QL-1 gloveboxes for the MFFF to verify that the documents were in accordance with regulatory and QA programmatic requirements and industry standards.

The inspectors reviewed the project record submittals and receipt inspection packages associated with two gloveboxes: 1) Scrap Box Loading Units (PAR) and 2) Pellet Repackaging Units (PAD). For these two QL-1 gloveboxes, the inspectors evaluated the adequacy of the documentation packages with respect to procurement specifications and other engineering-related documents. The inspection of these documentation packages focused on ensuring that the vendor met specification requirements associated with these QL-1 mechanical components.

The documentation packages reviewed contained the following records and reports associated with each glovebox, as applicable: (1) Receipt Inspection Reports (RIRs); (2) Suppliers Certificate of Compliance; (3) Certified Material Test Reports (CMTRs); (4) Final Design Drawing; (5) Final Assembly and Fabrication Drawing; and (6) NCRs.

The inspectors reviewed design and procurement documentation for QL-1 gloveboxes to verify that selected aspects of the integrated safety process, design process, procurement process, and quality assurance controls were incorporated. Nonconformances that were reviewed were documented in NCRs and the dispositions were evaluated.

The inspectors reviewed material certifications, welding procedures for AWS D1.6 structural welding of stainless steel, welder performance qualifications, and results of radiography for a completed production weld on the Pellet Repackaging Unit (PAD) glovebox to verify control and traceability. The inspectors randomly selected full penetration weld number S54 from the PAD fabrication drawing (11201) for the QL-1 glovebox shell. The Robatel Industries production record for Welding Monitoring – Report of Examination FSS 1/2/1 identified traceable information for each production weld that included:

1) Sheet-No. 1 of the welding procedure specification (WPS),

2) Heat number of the weld filler metal,
3) Unique identifying number for each welder,
4) Visual acceptance of weld by each inspector, and
5) Radiographic nondestructive examination report.

The inspectors reviewed the WPS for the gas tungsten arc welding (GTAW) process to verify compliance with the American Welding Society (AWS) D1.6 code for structural welding of stainless steel. Inspectors reviewed the Robatel Industries purchase order in the RIR for weld filler metal to confirm that the applicable QA and regulatory requirements were applied. The inspectors reviewed the CMTR for weld filler metal heat number 34356-143836 to verify that the chemical analysis was performed in accordance with SFA/A-5.9 specification for AWS classification number ER308L. The inspectors also reviewed the welder qualification records for two welders with unique identification numbers and documentation for final visual testing (VT) and radiographic testing (RT) for weld number S54 to verify compliance with the applicable codes and welding requirements specification.

Some of the gloveboxes were procured from and fabricated by European vendors in accordance with European standards, although design documents and fabrication drawings required American codes and standards (i.e., AWS D1.6 for the PAD glovebox shell). The inspectors reviewed the MFFF code reconciliation documents to verify that the gloveboxes fabricated to European standards met the American codes and standards as designed. For instance, material designation and linkage was performed using the Unified Number System (UNS) number for metals and alloys managed by the ASTM which are worldwide recognized standards.

b. Conclusions

For the sample reviewed, MOX Services performed design and engineering activities related to QL-1 gloveboxes (PSSC-24) in accordance with their specifications, procedures and the MPQAP.

The applicant maintained the physical condition of the quality-related gloveboxes sampled through the use of proper handling, storage and control techniques of mechanical equipment. In addition, the applicant maintained the associated records and documentation for these quality-related gloveboxes. No findings of significance were identified.

8. Electrical Components and Systems, (IP 88138)

a. Receipt, Storage, and Handling of Materials

(1) Scope and Observations

The inspectors verified receipt, storage, and handling of purchased electrical cables implemented applicable regulatory requirements and application commitments. In addition, inspectors reviewed the implementation and effectiveness of quality assurance oversight of electrical and I&C design activities.

The inspectors conducted direct inspections of the warehouse facility to verify that received items were controlled and that measures were established to prevent inadvertent use of nonconforming items. The inspectors observed that electrical cable

received in stores was inspected by warehouse and quality control personnel and observed that stored cables were protected against damage or degradation. Access to stored items was controlled, items were properly labeled, and the status of receipt inspection was clearly marked. The inspectors selected samples of stored cable to verify the material controls records, and examined the associated inspection reports to verify material traceability and quality documentation.

In addition, the inspectors observed the issuance and receipt of electrical cables to a work station designated to support assembly and testing of gloveboxes. Staged materials were verified to be controlled and protected against degradation. Personnel responsible for handling and maintenance of the cables were interviewed and observed to perform their work in accordance with written and approved instructions.

(2) Conclusions

The inspection of controls for receipt, handling, storage, and issuance of electrical components determined that the applicant verified materials met quality requirements; materials were protected against loss, damage, or degradation, and measures were established to prevent inadvertent use of unacceptable items. No findings of significance were identified.

b. Quality and Management Oversight

(1) Scope and Observations

The inspectors evaluated the implementation and effectiveness of quality and management oversight of engineering. During 2009, oversight activities included a quality assurance (QA) audit of engineering design and a technical assessment of software design activities. The inspectors reviewed the audit and assessment reports and held discussions with QA management, engineering management, software design group management and software design engineering staff. The audits were found to be thorough and were conducted and documented in accordance with the applicant's procedures. Follow-up actions and resolution of audit findings were timely and adequately documented. The inspectors assessed the qualification of a QA Audit technical specialist subcontractor and verified qualification was documented in accordance with the applicant's implementing procedure.

(2) Conclusions

Quality Assurance audits and technical assessments of software design activities were comprehensive and provided verifications that technical and quality requirements were addressed during design activities. No significant issues were identified by inspectors.

9. Problem identification, Resolution and Corrective Action (IP 88110)

a. Scope and Observations

NCRs, CRs, and ECRs generated by the applicant were reviewed to verify the proper documentation and resolutions of problems identified onsite. The inspectors noted that these items were adequately documented in the Corrective Action Program. Review of MOX Services' procedures and interviews with the applicant's staff confirmed that a process exists for documenting and reporting conditions adverse to quality to

appropriate levels of management responsible for the conditions, and to the organization responsible for the condition.

The inspectors determined that the applicant had established adequate procedures for the identification and resolution of conditions adverse to quality, as required by Section 16, Corrective Action, of the MPQAP.

b. Conclusions

The applicant had established a program and procedures that adequately implemented the corrective action program in accordance with the applicant's MPQAP. No findings of significance were identified.

10. Vendor Oversight Activities

During June 21-24, 2010, an inspection of MOX Services' oversight of one of its vendors was conducted at Flanders CSC, Inc. The activities observed during the inspection included the inspection of fabrication activities of selected QL-1 gloveboxes associated with PSSC-024 as well as vendor implementation of the applicant's MPQAP requirements.

a. Structural Welding General Inspection (IP 55100)

(1) Scope and Observations

(a) Program Review

The inspectors reviewed Flanders' Quality Assurance Manual (QAM), Rev. 4, Section 9.0, Control of Special Processes, and implementing procedures to verify compliance with:

- MOX's Project Quality Assurance Plan (MPQAP), Rev. 8
- ASME NQA-1-1994 through 1995 addenda
- AWS D1.6: Structural Welding Code - Stainless Steel, 1999 Edition (AWS D1.6)
- and applicable MOX procurement specifications

The reviewed documents contained adequate detail for the control of the special process of welding.

(b) Procedures and Qualifications

The inspectors reviewed Flanders' welding procedure specifications (WPSs) that were being used for welding the MOX gloveboxes. Additionally the inspectors reviewed the qualifying procedure qualification records (PQRs) for the WPSs as well as a welder performance qualification record and continuity log. The documents were reviewed to verify compliance with the requirements of MOX procurement documents and AWS D1.6 Code. The inspectors noted that Flanders' welders and procedures were qualified per the ASME Boiler and Pressure Vessel Code (BPVC) Section IX rather than the AWS D1.6 Code, which is permitted by the AWS D1.6 Code.

The reviewed documents were found to be adequate and in compliance with the applicable requirements, including ASME Code Section IX.

(c) Welding Material Control

The inspectors performed a walk-down of Flanders' welding and material storage areas. The walk-down included observations and interviews with Flanders personnel to verify that Flanders' practices for the following areas met their procedural and procurement contract requirements:

- Handling, identification, and control of stainless steel material
- Storage and issuance of welding filler material
- Segregation of carbon and stainless steels
- Storage and control of tools

The observed activities were found to meet all applicable requirements.

(d) Work Observation

The inspectors reviewed the work packages, WPS, and other documentation for the partially completed base-plate of Glovebox NBY1000 (Flanders drawing no. 200001822 Rev. A). The base-plate weldment will contain over 200 individual welds when completed. The weld-map lists the welds and is used to record the welder ID, the filler and base metal heat numbers, as well as other information required for traceability. While reviewing the weld-map, the inspectors noted instances where welds that had been completed were filled out completed and other completed welds which had also been completed were not filled out. The inspectors noted that the weld map for NBY 1000 base plate was filed out showing that weld no. 153 was completed. Further inspection determined that the weld had not been started, while weld no. 157 was completed on the base plate, yet the weld map was not filled out showing that this weld was completed. When interviewed, the foreman explained that the welder had completed all the welds and filled out the portions of the weld map he had performed afterwards.

Incorrectly filling out the weld-map, especially one that has a large number of welds, and documenting completed welds at a later time from when the welds were completed, could lead to a loss of traceability if the remaining welds are completed by a different welder or different weld filler metal heat number. NQA-1 1994 Supplement 8S-1 Paragraph 3.1 states, in part: "When specified by codes, standards, or specifications that include specific identification or traceability requirements, the program shall be designed to provide such identification and traceability control." Additionally, MOX Glovebox specification DCS01-ZMJ-DS-SPE-M-19113-4, Section 2.1.3 states, in part: "Traceability of metals shall be provided through all phases of fabrication and to the end product." This issue was identified as the first example for VIO 70-3098/2010-002-003: Welding Process Control Problems. Flanders initiated Corrective Action Request (CAR) No. 60, dated June 24, 2010, to address this issue.

The inspectors also noted that the base plate for Glovebox NBY1000 was symmetrical in shape and configuration. The inspectors observed that there was no marking or identification on this base plate to provide a reference point to identify which weld on the base plate corresponded to each weld on the weld-map, because the weld-map contained over 200 welds. With no marking on the base plate, there was no traceability

to connect a weld on the base plate to the weld referenced on the weld-map. This issue was identified as the second example for VIO 70-3098/2010-002-003: Welding Process Control Problems. Flanders initiated CAR No. 61, dated June 24, 2010, to address this issue.

The inspectors also observed tack welds and weld preparation activities for the base-plate of Glovebox No. NBX1000 (Flanders drawing no. 200001822, Rev. A). The work instructions called for flux core arc welding (FCAW) per Welding Procedure Specification (WPS) No. WP-38-1 Rev. 0. The inspectors identified two tack welds on the structure, which were not made using a qualified welding procedure. Upon further inspection and interviews, the inspectors determined that the tacks in question had been made by a different welder using the gas tungsten arc welding process (GTAW) without weld filler metal. The change in welder and welding process was not completed to any approved instructions and was not documented.

AWS D1.6 states in 5.7.1 that "Tack welds shall be subject to the same quality requirements as the final welds" and AWS D1.6 states in part in 5.7.4: "Temporary welds shall be subject to the same WPS requirements as final welds." Additionally MOX specification DCS01-ZMJ-DS-SPE-M-19107-6, Section 3.1 states, in part, "All welding shall be performed by qualified welders, using Welding Procedure Specifications (WPS's) either pre-qualified or qualified by test in accordance with the applicable AWS code or ASME Section IX." Flanders GTAW Welding procedure was only qualified for use with filler metal and both AWS D1.6 and ASME Section IX list the addition or deletion of filler metal as an essential variable. This issue was identified as the third example for VIO 70-3098/2010-002-003, Welding Process Control Problems. Flanders generated NCR Nos. 586 and 587, and CAR NO. 58, dated June 23, 2010, to address this issue.

Additionally, while observing activities with the base-plate of Glovebox NBX1000 the inspectors reviewed the production traveler [EP NBX 02 (GB-1000) Rev. A]. The inspectors noted that the weld traveler was in the possession of the foreman and not being used by the welder. In addition, the inspectors noted that the weld traveler did not clearly identify step-by-step instructions or hold points for QC or NDE inspections. Upon questioning, the welders stated that aside from the welding procedure and the foreman's direction, they did not work to written work instructions with hold-points such as a traveler. They further stated that they knew to stop work for inspection by verbal communication with the foreman.

As a result of this condition, it was found that the base-plate traveler had been signed by QC for approval of a weld before the tack-welds and base metal had been appropriately cleaned. MOX's MPQAP, Section 10.2 states in part: "Inspection activities are documented and controlled by instructions, procedures, drawings, checklists, travelers or other appropriate means… Documented Inspection planning shall include… identification of when, during the work process, inspections are to be performed for those characteristics."

MPQAP, Section 5.2.2, Content of Implementing Documents, states in part: "Implementing documents shall include the following information as appropriate to the work to be performed: A sequential description of the work to be performed (unless otherwise specified) including controls for altering the sequence of required inspections, tests and other operations." This issue was identified as the fourth example for VIO 70-3098/2010-002-003: Welding Process Control Problems. Flanders generated CAR No.

56, dated June 22, 2010 and CAR No. 62, dated June 24, 2010, and Supplier Deficiency Report No. FFI-10-SIR166-01 to address this issue.

Lastly, the inspectors observed GTAW Welding of Glovebox NBX1000 Weldment Mounting Members (drawing no. NBXMG-PLDM11202-0100Y, Rev. A). The inspectors observed practices and interviewed the welders to verify that the following activities were in compliance with the applicable code(s), procedures, drawings, and specification requirements:

- Welding variables
- Welding technique
- Filler metal handling and control
- M&TE calibration and control
- Preheat and interpass temperature verification and control
- Cleaning
- Electrical characteristics
- Shielding gas

All observed activities were found to meet the applicable requirements.

(2) Conclusion

One violation (VIO 70-3098/2010-002-003: Welding Process Control Problems) was identified. Glovebox KCB3000 that was manufactured by Flanders was already delivered and accepted by MOX Services. In addition, MOX Services performed an assessment of their vendor, Flanders, from May 3-6, 2010 in the areas of: personnel qualification and training; design control and interface activities; materials procurement and control; inspection; commercial grade dedication; special processes; testing and test equipment; corrective action; nonconforming conditions; and records. MOX Services' assessment of Flanders and related findings is documented in Assessment No. FFI-10-VS-171. All other observed activities and reviewed documents (Supplemental Information Section) were found to meet the applicable requirements.

b. Quality Assurance Program Development and Implementation (IP 88106)

(1) Scope and Observations

The inspectors reviewed QAM-4, Flanders Quality Assurance Manual, to determine if Flanders has adequately documented a quality assurance program consistent with the requirements of the MPQAP. The inspectors verified that Flanders had identified the duties, authority, and responsibilities of persons performing quality-related functions. The inspectors reviewed the organizational structure of Flanders to determine if the Quality Assurance Manager reports to a management level such that the required authority and organizational freedom are provided. The inspectors reviewed training records for personnel who perform activities affecting quality to assure that indoctrination training was completed and proficiency was achieved and maintained.

The inspectors verified that activities affecting quality are documented in accordance with written instructions, procedures, and drawings. The inspectors reviewed procedures and training records for personnel that perform NDE activities such as visual weld inspection, pressure decay leak testing, and bubble leak testing to ensure they meet the requirements of ASNT-TC-1A. The inspectors verified that Flanders has

programs to detect and correct quality issues and non-conformances. The inspectors determined that Flanders has implemented programs for special processes, test equipment, and material traceability. The inspectors verified that Flanders is completing internal audits and management assessments of their quality assurance program. The inspectors verified that Flanders is completing external audits of suppliers and that approved suppliers are maintained on an ASL. The inspectors reviewed training and qualification records for lead auditors. The inspectors concluded that the Flanders QA Program meets the requirements of the MPQAP.

(2) Conclusion

The inspectors concluded that Flanders QAM provided adequate identification and definition of the duties, authorities, and responsibilities of their personnel performing quality-related activities and functions. No findings of significance were identified.

c. Design and Documentation Control (IP 88107)

(1) Scope and Observations

The inspectors reviewed MOX Services design and document control documentation for proper implementation in accordance with MPQAP, Rev. 8. The inspectors reviewed a sample of controlled design documents in areas that were associated with the fabrication of gloveboxes. The sample of fabrication and design documents were reviewed and selected from those associated with PSSC-024. In addition, the inspectors reviewed design specifications and procedures to verify proper implementation of requirements necessary to control design activities for PSSC-024, Gloveboxes. Through discussions with MOX Services staff and vendor personnel from Flanders, and review of QA documentation, the inspectors verified proper implementation of procedures related to design control. The inspectors reviewed ECR-007564 for Quality Level 1 (QL-1), FCAW downward progression of welding.

(a) Design Control

The inspectors reviewed Flanders Procedure WI-08-002, Design Control for Supplemental Control Jobs, and determined that the procedure met the requirements outlined in Criteria III of ASME NQA-1.

The inspectors reviewed Flanders purchase orders for engineering services such as seismic shaker testing and seismic analysis for filters and filter housings. The inspectors verified that the vendors were on Flanders ASL for engineering services related to seismic testing and analysis. The inspectors reviewed design drawings for MOX filter systems to assess implementation of the Flanders design control procedure.

The inspectors interviewed Flanders Engineering personnel to determine their level of understanding of the Flanders design control procedure, NQA-1 and MOX Services requirements. Based on the documents reviewed, field observations, and interviews conducted, the inspectors concluded that the Flanders design control program met the applicable requirements of MPQAP and NQA-1 with regard to MOX work scopes where Flanders is the design authority of record.

(b) Document Control

The inspectors reviewed CP-01-006, Document Control, to verify that Flanders' document control process complied with the MOX MPQAP. The inspectors sampled controlled documents to verify that procedures were followed. The inspectors reviewed CP-01-005, Flanders Procedures and Work Instructions, to verify compliance with ASME NQA-1. Based on the sampling, the documents reviewed were found to meet the applicable requirements.

(c) Quality Assurance Records

The inspectors reviewed Flanders procedures and program to verify that they complied with the MOX MPQAP and ASME NQA-1 requirements for storage of quality assurance records. The inspectors examined and sampled quality assurance records in storage to verify compliance with the storage requirements of ASME NQA-1. Additionally, the inspectors interviewed Flanders personnel responsible for controlling the storage of quality assurance records to verify procedures were followed.

(2) Conclusion

Based on the sampling, storage and control of QA records, and the documents reviewed, the vendor was found to meet the applicable design and document control requirements specified in the MPOQAP. No findings of significance were identified.

d. Control of Materials, Equipment, and Services (IP 88108)

(1) Scope and Observations

The inspectors conducted a review to verify procurement controls were established to assure purchased materials and services conformed to the technical and quality requirements, and that measures were established to prevent inadvertent use of nonconforming items. The inspectors reviewed program procedures and procurement records; and examined records of inspection, audit activities, and nonconformance reports. Personnel responsible for the specification and verification of program requirements were interviewed.

The inspectors determined that purchase order packages outlined the technical and quality requirements for purchases of materials and services. The inspectors determined that the results of commercial grade item evaluations were adequately documented. The inspectors concluded that the records of commercial grade dedication activities did not demonstrate that dedication activities identified and verified critical characteristics for acceptance of items. This failure to adequately verify critical characteristics of materials being procured from commercial suppliers was identified as a violation of NRC requirements, as noted below.

(a) Procurement Control System

The inspectors reviewed Flanders procedures and program of procuring materials and components used in the fabrication and construction of QL-1 item relied on for safety (IROFS) gloveboxes to verify that they complied with the MOX MPQAP and ASME NQA-1 requirements for control of materials, equipment and services.

The inspectors performed a walk-down of Flanders' material storage and fabrication areas to verify that material was properly identified. The inspectors took several random samples to verify traceability back to the procurement documents and certified material test reports (CMTRs) (Supplemental Information Section). All observed activities and documents were found to meet the applicable requirements.

(b) Identification and Control of Material, Parts, and Components

The inspectors reviewed Flanders procedures and program to verify that they complied with the MOX MPQAP and ASME NQA-1 requirements for material identification. The inspectors performed a walk-down of Flanders' material storage and fabrication areas to verify that material was properly identified and stored. The inspectors took several random samples to verify traceability back to the procurement documents and CMTRs. All observed activities and documents were found to meet the applicable requirements.

(c) Handling, Storage, and Shipping

The inspectors reviewed Flanders procedures and program to verify that they complied with the MOX MPQAP and ASME NQA-1 requirements for stainless steel material handling and storage. The inspectors performed a walk-down of Flanders' material storage and fabrication areas to verify implementation of procedural requirements for the following material controls:

- Cleanliness and housekeeping
- Carbon steel / Stainless steel segregation
- Use of Halide containing materials on austenitic stainless steels

All observed activities and documents were found to meet the applicable requirements.

(d) Nonconforming Materials, Parts, or Components

The inspectors reviewed reports and documents related to nonconformances of materials, components and activities related to quality-related work to IROFS equipment being fabricated by Flanders for MOX Services that is associated with PSSC-024, Gloveboxes. All observed activities and documents were found to meet the applicable requirements.

(e) Programmatic Review of Commercial Grade Dedication

The inspectors reviewed Flanders' procedure JS-MOX-001, Commercial Grade Item Dedication for MOX Projects, to determine if Flanders adequately implemented the MOX commercial grade dedication (CGD) program. The inspectors reviewed completed CGD worksheets for glovebox raw materials and components to ensure that Flanders completed the necessary tests and inspections for verification of critical characteristics. The inspectors witnessed QC personnel perform Method 1 special tests and inspections to verify critical characteristics such as dimensional measurements, reviews of CMTRs for compliance with material specifications, and positive material identification (PMI) testing. The inspectors interviewed personnel involved with the development and use of PMI.

The inspectors reviewed MOX Services report DCS01-ZMJ-DS-NTE-N-65973-2, Technical Basis for Generic Critical Characteristics for Acceptance for QL-1 Materials

and Purchased Parts for the MFFF, to determine if the technical basis developed by MOX Services is adequate to provide reasonable assurance that the material will be capable of performing its intended safety function to confine radioactive and other hazardous powder or fluid materials within a specified boundary. The inspectors noted that chemical composition (material type/alloy/grade/class), tensile strength, yield strength, and hardness (as applicable) were identified as critical characteristics for materials associated with process equipment, gloveboxes, piping, and piping system components.

The inspectors noted that MOX Services/Flanders used the PMI (X-Ray fluorescence) method to validate material test reports (MTRs) for the verification of S30403 (304L) stainless steel material received from commercial suppliers. PMI is listed as an allowable acceptance method by MOX Services as documented in DCS01-ZMJ-DS-CGD-M-65858-2, Commercial Grade Item Evaluation for Ferrous Steel Material for Gloveboxes and Subassemblies and the MOX QAPD. During the inspection, the inspectors questioned the validity of using PMI for 304L stainless steel material because PMI can only detect metallic constituents, such as chromium, nickel, and manganese, and it cannot measure or determine non-metallic constituents.

PMI is not capable of measuring carbon content, which is the main differentiator between 304 and 304L stainless steel materials. MOX Services referred the inspectors to report, DCS01-ZMJ-DS-NTE-N-65973-2, Technical Basis for Generic Critical Characteristics for Acceptance for QL-1 Materials and Purchased Parts for the MFFF, to provide the technical basis for using PMI for 304L material. According to this report, PMI combined with material identification and dimensional checks provide reasonable assurance that the material specified is the material received. This MOX Services report states, in part, that the chemical analysis performed as part of the PMI process is used to validate the certified material test report (CMTR). The 304L stainless steel materials, as well as most materials and components, which Flanders procures, are from unaudited, commercial grade suppliers. The documentation provided by these commercial suppliers is not considered certified, therefore, they are not providing a true CMTR only an MTR. MOX Services explained that the following checks are made with regards to use of PMI:

1. Compare MTR results to ASTM Standard for 304/304L material (ASTM A240).

2. Compare PMI results to ASTM Standard (ASTM A240) – this includes the application of product tolerances identified in ASTM A480. These product tolerances are applied to the ASTM A240 values for chromium, manganese, and nickel to account for inherent uncertainties associated with the PMI equipment.

3. Compare PMI results to the values reported on the MTR for chromium, nickel, and manganese. MOX Services stated that the tolerances identified in ASME Code Case N-483, Alternative Rules to the Provisions of NCA-3800, Requirements for Purchase of Material Section III, Divisions 1 and 3, were applied to the reported MTR values to account for inherent uncertainties in the PMI process. The allowable tolerances are the lesser of 0.5% or 15% as applied to the values reported on the MTR. It should be noted that the NRC has not endorsed ASME Code Case N-483 as stated in Regulatory Guide 1.193, ASME Code Cases Not Approved for Use, nor has MOX Services included use of this ASME Code Case in their MPQAP or CAR.

MOX Services has specified 304L stainless steel material in the detailed design for the majority of the gloveboxes, equipment, and piping to address general concerns associated with corrosion. The MFFF Integrated Safety Analysis (ISA) Summary, Section 4.3.9.1 states, in part, "The function of gloveboxes is to maintain a confinement barrier for the radioactive and other hazardous materials that may be present in the glovebox…The typical glovebox is a large, stainless steel (material S30403) enclosure that is mounted on a structural steel stand, which is anchored to the floor and/or ceiling." ISA, Section 4.7.5.1, Materials of Construction, states, in part, "…stainless steel 304L or 316L and specialty materials titanium and zirconium are used for FTS category 1 components that handle process fluids with acidic or radiological properties. FTS category 2 and 3 components handling process fluids that are acidic or alkaline in nature are also constructed from stainless steel 304L or 316L materials."

MPQAP, Section 7.1, states, in part, "MOX Services procurement of Quality Level 1 and Quality Level 2 material, equipment and services is controlled to assure conformance with specified technical and QA requirements… evaluations of received items and services are performed, as necessary, upon delivery or completion to ensure requirements specified in procurement documents are met." MPQAP, Section 7.2.12.C.5, states, in part, "Prior to release as a commercial grade item, MOX Services shall determine that inspection and/or testing is accomplished as required, to assure conformance with critical characteristics and that documentation, as applicable to the item, was received and is acceptable." Based on the review of the PMI process with regards to CGD, as outlined in DCS01-ZMJ-DS-NTE-65973-2, the inspectors concluded that MOX Services had not provided reasonable assurance to confirm that the material received was 304L verses other grades of stainless steel such as 304 and 304H (high carbon content). This conclusion is based on the following:

1. The check performed by MOX Services to confirm that the PMI results are correlated to the reported MTR values expanded by the 15% not to exceed 0.5% tolerances are not adequate to confirm that the results reported on the MTR were obtained from the material tested. Specifically, there is not enough variability in the chemical content between 304, 304L, and 304H (except carbon content) to provide reasonable assurance that an issue related to a loss of material traceability could be detected.

2. MOX Services did not perform certified (QL-1) laboratory analysis to confirm the carbon content of the 304L stainless steel material as reported on the commercially supplied MTR. PMI (X-Ray fluorescence) can only measure metallic content such as chromium, nickel, and manganese, but cannot measure carbon content or other non-metallic components. PMI can only provide reasonable assurance of the metallic contents of the material to determine whether it is 304/304L/304H stainless steel material.

3. MOX Services has not performed certified (QL-1) laboratory testing to confirm physical properties such as tensile and yield strength as reported on the MTR.

4. MOX Services has not performed a commercial grade survey of the material suppliers to confirm the ability of their suppliers to maintain material traceability. See item 1 above.

MOX Services generated CR number MOX CR 10888-MOX-CR-10-312 to address this issue.

(2) Conclusion

One violation was identified related to the failure to properly implement an adequate commercial grade dedication process through the incorrect use of PMI for verification of 304L stainless steel material ((VIO) 70-3098/2010-002-004: Inadequate CGD of QL-1 materials).

Based on the sampling, documents reviewed, and adherence to CGD procedures of other observed activities, the inspectors concluded that Flanders had adequately implemented the MOX CGD program and met the applicable requirements.

e. Inspection, Test Control & Control of Measuring Equipment (IP 88109)

(1) Scope and Observations

The inspectors conducted a review to verify inspection, test control and control of measuring and test equipment (M&TE) conformed to technical and quality requirements. The inspectors reviewed Flanders' program procedures, records of inspection and calibration activities. Personnel responsible for handing of M&TE were interviewed. The inspectors found the calibration program and associated records of M&TE to be adequate in meeting the requirements of the MPQAP and ASME NQA-1.

(a) Inspection

The inspectors reviewed Flanders procedure WI-02-007, Qualification of Inspection and Test Personnel per NQA-1, to assess compliance with ASME NQA-1 requirements. The inspectors reviewed qualification records for Flanders QC personnel that performed non-destructive examinations (NDE), receipt inspection, and special tests and inspections as required by the CGD program. The inspectors reviewed Flanders procedure JS-MOX-014, I/P Shop Inspection & QC Final Dimensional, Surface Finish inspection. The inspectors witnessed QC inspectors perform glovebox dimensional inspections and positive material identification (PMI) testing of glovebox materials. The inspectors reviewed completed receipt inspection reports for glovebox materials and components.

The inspectors reviewed Flanders procedures JS-MOX-003, Liquid Penetrant Examination; JS-MOX-002, Visual Inspection of Welds; and JS-MOX-010, Ultrasonic Inspection to determine if the Flanders NDE inspection program meets the requirements of NQA-1. The inspectors interviewed Flanders NDE personnel to verify procedures were followed during NDE inspection. Based on the sampling, documents reviewed and adherence to NDE procedures, the vendor was found to meet the applicable requirements.

(b) Test Control

The inspectors reviewed Flanders procedure JS-MOX-011, Mechanical Penetration Testing, to determine if the Flanders test control program meets the requirements of NQA-1. The inspectors reviewed completed test records for leakage tests performed on glovebox mechanical penetration housings.

(c) Measuring and Test Equipment

The inspectors verified that M&TE used by QC inspectors for dimensional measurements and PMI testing was properly calibrated in accordance with the Flanders M&TE procedure.

(2) Conclusion

The inspectors concluded that the test control program related to the fabrication of MOX gloveboxes was found to meet the applicable requirements of NQA-1 based on the sample of documents reviewed. No findings of significance were identified.

f. 10 CFR 21 Inspection – Facility Construction (IP 88111)

(1) Scope and Observations

The applicant's vendor had adequately established procedures and program activities to effectively implement the requirements of 10 CFR Part 21. The vendor's procedure for addressing 10 CFR Part 21 posting requirements, procurement documents, evaluation of deviations, notifications, and maintenance of records were reviewed to verify compliance.

The inspectors performed walk-downs of several buildings at the Flanders manufacturing facility. Flanders had adequately implemented the postings requirement of 10 CFR 21.6. Flanders procurement documents were reviewed and found to have complied with the requirements of 10CFR 21.31 regarding specifying the applicability of Part 21.

The inspectors verified that the requirements of 10CFR 21.51 had been properly implemented. Flanders had adequate controls in place to assure proper maintenance of required records.

(2) Conclusion

Flanders' procedures, activities, documentation and corrective action program satisfied 10 CFR Part 21 requirements. No findings of significance were identified.

g. Supplier/Vendor Inspection (IP 88115)

(1) Scope and Observations

The inspectors reviewed the vendor's Quality Assurance Program (QAP) requirements for the control of special processes, such as: welding, weld defect repair, NDE procedures, NDE personnel qualification and certification, to ensure compliance with the applicable quality and technical requirements established by the MPQAP, MFFF construction specifications, and applicable ASME NQA-1 code requirements.

The inspector's activities consisted of an on-site record review and observation of in-process welding activities to determine compliance with the MPQAP and 1994 edition, including 1995 addenda, of the ASME NQA-1 Code. Additionally, the inspectors reviewed a sample of weld reports to verify that weld related indications, defects, nonconformances, and other related conditions adverse to quality, if present, were

appropriately evaluated and dispositioned in accordance with the MPQAP and applicable code acceptance standards. The inspectors reviewed the vendor's process and procedures for weld repairs and found them to be acceptable.

The inspectors reviewed MOX Services Assessment Report FFI-10-VS-171 – Flanders CSC, Inc. to determine if MOX Services had conducted adequate oversight of its vendor. This assessment report documented adequate oversight by MOX Services over its Flanders CSC, Inc. The inspectors observed a variety of welding activities at Flanders and reviewed a variety of documents associated with welding taking place at Flanders on QL-1 IROFS components being manufactured by Flanders for MOX Services.

The inspectors reviewed documentation and interviewed Flanders receiving personnel to verify that procedures were followed and compliance with MOX MPQAP and NQA-1. The inspectors verified that once procurement documents were in Flanders possession, the documents were controlled in the correct manner. Based on the sampling, documents reviewed and adherence to document control procedures was found to meet the applicable requirements.

(2) Conclusion

MOX Services conducted an adequate audit of its vendor. No findings of significance were identified.

h. Mechanical Components (IP 88136)

(1) Scope and Observations

The inspectors verified that the gloveboxes associated with PSSC-024 were designed, procured, and being manufactured in accordance with Construction Authorization No. CAMOX-001, Revision 2, dated June 12, 2008. The inspectors determined that the technical requirements associated glovebox mechanical components contained adequate detail and were appropriately referenced in the MPQAP. The gloveboxes being manufactured by Flanders as Seismic Category I (SC-I) or SC-II systems have been adequately addressed in construction and procurement specifications, drawings, and work procedures.

The inspectors determined that the requirements and commitments, in the approved MPQAP, have been adequately addressed in QA plans, instructions, and procedures, for mechanical components, and have been adequately established in the vendor's quality-related documents. The inspectors determined that the applicant and Flanders adequately implemented the QA program associated with mechanical components, to include: (1) preparing, reviewing, and maintaining a system of quality records; and (2) records reflected work accomplished consistent with NRC requirements, Construction Authorization Request commitments, and the MPQAP.

(2) Conclusion

No findings of significance were identified.

11. Exit Interviews

The inspection scope and results were summarized throughout this reporting period by the senior resident inspector on July 8, 2010 and region based inspectors on April 2, 2010, April 29, 2010, and June 18. On June 24, 2010, the inspectors described the areas inspected and discussed the inspection results in detail with one of the applicant's vendors (Flanders).

During subsequent teleconferences with the applicant, as noted below, the inspectors further discussed violations 70-3098/2010-002-002, 70-3098/2010-002-003, and 70-3098/2010-002-004.

With regard to violation 70-3098/2010-002-002, additional information related to MOX Services interpretation of NQA-1 was provided to the inspectors after the exit meeting. This information was reviewed by the NRC inspection staff and discussed in detail with MOX Services during a teleconference on July 27, 2010. Dissenting views pertaining to 70-3098/2010-002-002 were received from the applicant during the teleconference.

In addition, a re-exit meeting was held with MOX Services on July 28, 2010 for the NRC inspection conducted at MOX Services' vendor (Flanders CSC) during June 21-24, 2010. This re-exit meeting discussed the inspection findings identified at Flanders and the characterization of those findings as two violations of MPQAP requirements (70-3098/2010-002-003 (four examples) and 70-3098/2010-002-004). Dissenting comments were not received from the applicant during the teleconference.

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.

1. PARTIAL LIST OF PERSONS CONTACTED

Applicant Personnel

M. Bagale, Vice President Process Unit Design and Commissioning
L. Ballard, Compliance Manager
F. Carter, Civil/Structural Engineering Manager
J. Creech, Lead Mechanical Process Unit Engineer
R. Daniels, Lead Chemical and Mechanical Engineer Manager
J. Gomez, Electrical/I&C Engineering Manager
D. Gwyn, Licensing Manager
D. Ivey, Quality Assurance Manager
D. Kehoe, Compliance Manager
L. Lamb, Vice President Engineering
H. Lawrence, Vice President Construction
J. Peregoy, Quality Control Manager
G. Shell, Project Assurance and Regulatory Affairs Manager
J. Russotto, Project Manager, STR Assembly & Test Group
K. J. Sweet, QA Specialist, Shop Inspector
K. Trice, (Acting) President and Chief Operating Officer
X. Verdeil, Manager Engineer, Process Unit Design Commissioning
R. Whitley, Quality Assurance/Quality Control Manager

MOX Vendor - Flanders Personnel

P. Berna, Engineering Manager
S. Deans, MOX QC Inspector
E. Deal, Director of MOX Glovebox Project
P. Jones, Vice President of Procurement
R. Midgette, Project Manager Containment
M. Mizell, Inventory Supervisor and Commercial Dedication Supervisor
T. Morse, Director of Engineering
M. Sabol, Technical Application Manager
J. Urton, Director of Quality Assurance
S. Ward, Buyer / MOX Project
M. Waters, Welding Foreman

Other individuals contacted included supervisors, engineers, and inspection, measurement, and testing technicians.

2. INSPECTION PROCEDURES (IPs) USED

IP 55100	Structural Welding Inspection
IP 88106	Quality Assurance: Program Development and Implementation
IP 88107	Quality Assurance: Design and Documentation Control
IP 88108	Quality Assurance: Control of Materials, Equipment, & Services
IP 88109	Quality Assurance: Inspection, Test Control, and Control of Measuring and Test Equipment

IP 88110	Quality Assurance: Problem Identification, Resolution and Corrective Actions
IP 88111	10 CFR, Part 21, Inspection-Facility Construction
IP 88115	Supplier/Vendor Inspection
IP 88130	Resident Inspection Program for On-Site Construction Activities
IP 88131	Geotechnical/Foundation Activities
IP 88132	Structural Concrete Activities
IP 88134	Piping Relied on for Safety
IP 88136	Mechanical Components
IP 88138	Electrical Components and Systems

3. LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Item Number	Status	Description
70-3098/2010-002-001	Open	VIO: Failure to Identify Rebar Installations that did not Meet Clear Cover Requirements (Section 5.b)
70-3098/2010-002-002	Open	VIO: Inadequate Construction Specification Change (Section 6.b)
70-3098/2010-002-003	Open	VIO: Welding Process Control Problems (Section 10.a)
70-3098/2010-002-004	Open	VIO: Inadequate CGD of QL-1 Materials (Section 10.d)
70-3098/2009-002-004	Discussed	IFI: Follow-up Resolution of CR 2009-0163 on technical deficiencies of procurement specifications for batteries (Section 3.b)
70-3098/2009-002-002	Discussed	VIO: Failure to Correctly Translate Electrical Design Requirements into Design Documents (Section 3.b)

4. LIST OF ACRONYMS USED

AC	Alternating Current
ACI	American Concrete Institute
ADAMS	Agency-Wide Document Access and Management System
ANSI	American National Standards Institute
ASL	Approved Supplier's List
ASME	American Society of Mechanical Engineers
ASTM	American Society of Testing and Materials
AWS	American Welding Society
AWV	American Warming & Ventilating
BAP	Aqueous Polishing Building
BMF	Fuel Manufacturing Building
BMP	MOX Process Building
BOA	Basic Order Agreement
BOD	Basis of Design
BPVC	Boiler and Pressure Vessel Code
BSR	Shipping Receiving Building
CAR	Corrective Action Request
CAR	Construction Authorization Request
CES	Concrete Engineering Specialists
CFR	Code of Federal Regulations
CGD	Commercial Grade Dedication
CMTR	Certified Material Test Report
CR	Condition Report
DAR	Deficiency Action Request
DC	Direct Current
DCR	Design Change Request
DOE	Department of Energy
ECR	Engineering Change Request
EDG	Emergency Diesel Generator
FCAW	Flux Cored Arc Welding
FCSS	Fuel Cycle Safety and Safeguards
FTS	Fluid Transfer System
GTAW	Gas Tungsten Arc Welding
HVAC	Heating, Ventilating and Air Conditioning
IFI	Inspection Follow-up Item
IP	Inspection Procedure
IROFS	Item Relied on for Safety
ISA	Integrated Safety Analysis
ITL	Independent Testing Laboratory
M&TE	Measuring and Test Equipment
MCC	Motor Control Center
MFFBS	MOX Fuel Fabrication Building Structure
MFFF	MOX Fuel Fabrication Facility
MOX	Mixed Oxide
MPQAP	MOX Project Quality Assurance Plan
MTR	Material Test Report
NCR	Nonconformance Report
NDE	Nondestructive Examination
NDT	Non-Destructive Testing

NMSS	Nuclear Materials Safety and Safeguards
NNSA	National Nuclear Security Administration
NQA-1	Quality Assurance Program Requirements for Nuclear Facilities
NRC	Nuclear Regulatory Commission
PAD	Scrap Box Loading Unit
PAR	Pellet Repackaging Unit
PMI	Positive Material Identification
PO	Purchase Order
PP	Project Procedure
PSSC	Principle Structures, Systems, and Components
QA	Quality Assurance
QC	Quality Control
QL	Quality Level
Rebar	Reinforcing bar
Rev.	Revision
RIR	Receipt Inspection Report
RT	Radiographic Testing
SDR	Supplier Deficiency Report
S&ME	Soil & Material Engineers, Inc.
SMCI	Specialty Maintenance and Consulting, Inc.
STR	Subcontract Technical Representative
SRS	Savannah River Site
UNS	Unified Number System
VIO	Violation
VT	Visual Testing
WP	Work Package
WPS	Welding Procedure Specification

5. LIST OF PSSCs REVIEWED

PSSC-012	Emergency AC Power System
PSSC-015	Emergency DC Power System
PSSC-024	Glovebox
PSSC-034	MFFF Tornado Dampers
PSSC-036	MOX Fuel Fabrication Building Structure (including vent stack)
PSSC-044	Process Cell Exhaust System
PSSC-053	Waste Transfer Line

6. PARTIAL LIST OF DOCUMENTS REVIEWED

Shaw/Areva MOX Services Procedures:

PP3-4, Records Management, Rev. 6
PP3-5, Control of Non-Conforming Items, Rev. 6
PP3-6, Corrective Action Process, Rev. 13
PP3-12, Supplier Evaluation, Rev. 9
PP3-28, Quality Control Receiving Inspection, Rev. 2
PP7-4, Document Control, Rev. 6
PP8-3, Evaluation and Reporting of Defects and Noncompliance, Rev. 4
PP8-6, Licensing Basis Configuration Management, Rev. 7
PP9-3, Design Control, Rev. 17

PP9-6, Calculations, Rev. 9
PP9-9, Rev. 9, Engineering Specifications
PP9-14, Design Process, Rev. 4
PP9-18, Commercial Grade Item Evaluations, Rev. 4
PP9-19, Geotechnical Exploration and Testing, Rev. 1
PP9-21, Engineering Change Requests, Rev. 7
PP10-13, Offer/Proposal Evaluation and Award Recommendation, Rev. 3
PP11-3, Batch Plant Operating Instructions, Rev. 1
PP11-4, Batch Plant Mix Design and Validation Instructions, Rev. 0
PP11-5, Batch Plant Testing and Calibration Instructions, Rev. 1
PP11-12, Placement of concrete, Embedded Structural Items and Accessories, Rev. 0
PP11-25, Control of Issued QL-1 and QL-2 Material, Rev. 4
PP11-26, MOX Construction Material Management Storage, Handling and Control of Material, Rev. 2
PP11-35, Construction Inspection and Acceptance Testing, Rev. 3
PP11-45, Bending Reinforcing Steel, Rev. 1
PP11-46, Hydrostatic/Pneumatic Test Procedure, Rev. 0

Condition Reports

CR 20080180, dated 4/29/08, ECR80644 was approved without any QA Review
CR 20080384, Transformer Grounding
CR 20090142, NRC Inspection Items
CR 20090162, dated 04/29/2009, Documents detailing the EDG load shedding scheme are incongruent
CR 20090163, dated 4/29/2009, Ensure top tier information is transmitted down to requirements
CR 20090297, dated 08/04/2009, NRC Notice of Violation for failure to correctly translate electrical design requirements into design documents
CR 20090311, Transformer and cabling sizes inadequate
CR 20090355, Rev. 0, PP3-6 Calculation issued as QL-4 instead of QL-1
CR 20090408, Rev. 0, SDG Management Plan and Vendor Oversight for SPLC Systems
CR 20090414, Rev. 0, Procurement Specification QA requirements not evaluated at vendor
CR 20090418, Rev. 0, SPLC Vendor Activity Assessments
CR 20090419, Rev. 0, Internal I&C review issues with CP-23 Procurement Specs
CR 20090424, Rev. 0, Application of Codes and Standards in DCS01-EEJ-DS-DOB-E-40111-2
CR 20090427, Rev. 0, Electrical AC and DC Power System Deficient Items Identified from QA Audit SA09-A05
CR 20090444, Rev. 0, Procurement Documents for CGD
CR 20090467, Rev. 0, Co-ordination between Electrical and I&C, 12/8/09
CR-10-004, Rev. 0, IEEE 384 Standard applied to Fire Separation of Redundant IROFS
CR-10-136, Rev. 0, Vital Power System Analysis
CR-10-160, Rev. 0, Discrepancies in calculation DCS01-EEJ-DS-CAL-E-25093 resulted in non-conservative specification for battery size
CR-10-174, Rev. 0, ECR revision was not entered into Documentum
CR-10-177, Rev. 0, MFFF response to NRC NOV was incomplete
CR-10-156, Unit Weight Requirements for Select Structural Fill (QL-1 Activities)
CR-10-180, Soils Test Requirements Missed in Specification, updated June 17, 2010
CR-10-108, Conflicting ECR's regarding use of Controlled Low Strength Material (CLSM) in MOX Project
CR-10-282, Design and Analysis of Northern Safe Haven Walls and Slab Below Grade
CR-10-296, Record Not Processed into EDMS within Required Time Frame

Non-Conformance Reports (NCR):

EN-10-1784, The bend shall be made a minimum of 2" from the back of the plate
EN-10-1733, F Line between 2.4 and 3.4 Line Violates Maximum Clear Cover Requirements
CE-10-1498, Minimum clear spacing between re-bar
CE-10-2022, Embedded steel items
QC-10-1508, Molybdenum Boat Shoes CATID 8831
QC-10-1768, Rebar, Excessive Clear Cover
QC-10-1893, Glovebox Internal Junction Boxes
QC-10-1630, Bent Nelson Studs
NCR No. 554, MOX Glovebox KCB3000 Surface Flatness criteria not met
NCR No. 576, MOX Glovebox KCB4000 Hole found to be too small
NCR No. 586, Autogenous GTAW tack weld on FCAW weldment
NCR No. 587, Base plate welds of NBY Base failed visual examination

Supplier Deficiency Reports

FFI-10-SIR166-01, Weld fit-up & cleaning hold point inappropriately signed

Engineering Guidelines

EG05-5, Engineering Change Control

Engineering Change Request (ECR):

ECR-000631, Rev. 0, Vendor Cables Used in MDG Design
ECR-000633, Rev. 0, Accept Test Substitutes Proposed by Supplier for Test Procedures
ECR-000644, Rev. 1, Conduit Tray and Duct Bank
ECR-000747, Rev. 0, Flame Test Cables
ECR-002583, Rev. 1, Revised emergency diesel generator design requirements
ECR-003895, Rev. 0, Add switchgear to specification DCS01-EEJ-DS-SPE-E-25144-1
ECR-003900, Rev. 0, Add switch gear to specification DCS01-EEJ-DS-SPE-E-25144-1
ECR-004143, Rev. 0, Clarification of BOD for Electrical Systems
ECR-004294, Rev. 1, Necessary changes to Seismic Sections of Transformer Procurement Specifications
ECR-004341, Rev. 0, Add EMI/RFI Requirements to Electrical Procurement Specification
ECR-004358, Rev. 0, Revise Procurement Specification DCS01-EEJ-DS-SPE-E-25148-2 (VFDs) prior to award
ECR-004391, Rev. 0, Revise Quality Assurance Requirements
ECR-004477, Rev. 0, Additional transformers required in specification
ECR-004517, Rev. 0, Degraded Voltage/Under Voltage Changes
ECR-004673, Rev. 0 and Rev. 1, Errors in SRD for NBX
ECR-004674, Voided, Document Inconsistencies
ECR-004737, Rev. 0, Removal of UBC References from Electrical BOD
ECR-005250, Rev. 0, Revise Section 2.4 of DCS01-EEJ-DS-CGD-E-25208-2
ECR-005292, Rev. 0, Requirement Changes to DCS01-EEJ-DS-SPE-E-25106-2
ECR-005643, Rev. 0, EBA Battery Design Changes
ECR-005694, Rev. 0, Add submittals to DCS01-EEJ-DS-SPE-E-25120-3
ECR-005748, Rev. 0, Revise DCS01-EEJ-DS-SPE-E-25098-0 for Conduit Storage
ECR-005808, Rev. 0, NTM*CAB004 A and B 120 VAC power cable renumbered

ECR-005877, Rev 0, NCR-ZS1922 located in wrong room
ECR-006000, Rev. 0, Necessary changes to Switch specifications
ECR-006086, Rev. 0, Revise DCS01-EEJ-DS-SPE-E-25098-0 for Flex Conduit Lengths
ECR-006298, Rev. 0, Correct design requirements for variation in inverter output voltage and uninterruptible switching by maintenance bypass switch
ECR-005683, Rev. 0, To add another option for the correlation of the nuclear gauge
ECR-006415, Rev. 2, Revision to DCS01-WRT-DS-SPE-B-09307 to include unit weigh requirements
ECR-000613, Allowable tolerance for bending of embed plate studs/deformed
ECR-005507, Reinforcement needed around penetration and sump
ECR-006190, Disposition of NCR EN 10 1733
ECR-00-3224, NCR No.: BK-09-0825 (Concrete Pour No. BAP-W-107-A) Clear Cover Violations of 'BAP' 28" Wall @ F bet. 3.9 to 4.8, BAP 12" wall @ G.1 Bet. 4.8 & 5.2.1 & 18" walls @ 5.2.1 bet. G.1 and G.2 & at El. -17'-0" to +17'-0"
ECR-00-3281, Qualification of all the BAP Critical Walls @ El. – (17'-6") and @ El. 0'-0" for Clear Cover
ECR-007564, QL-1, FCAW downward progression of welding

Specifications

DCS01-ZMJ-DS-SPE-M-19113-5, Glovebox Shell Fabrication, Inspection and Test Requirements
DCS01-PPJ-ADG-SOW-M-50052, Statement of Work – Scrap Box Loading Unit (PAR) / Pellet Repackaging Unit (PAD)
DCS01-PRE-AG-SOW-M-50106-0, Statement of Work – Pellet Grinding Units (PRE / PRF)
DCS01-KCB-AG-SOW-M-50070-1, Statement of Work – Homogenization, Sampling and Filling Unit (KCB*GB2000*GB3000*GB4000*GB7000)
DCS01-KCB-DS-NTE-M-22459-B, MOX Fuel Fabrication Component Classification Summary for Homogenization – Sampling Unit (KCB) (KCB*GB2000*GB3000*GB4000*GB7000)
DCS01-KCB-MG-LDT-M-00001-2, List of Design Documents - Homogenization, Sampling and Filling Unit KCB (KCB*GB2000*GB3000*GB4000*GB7000)
DCS01-KCB-MG-NOM-M-00010-1, Mechanical Equipment List - Homogenization, Sampling and Filling Unit KCB (KCB*GB2000*GB3000*GB4000*GB7000)
DCS01-KCB-MG-CAL-M-30060-0, Potential Energy Calculation – Aqueous Polishing - Homogenization, Sampling and Filling Unit - KCB*GB3000
DCS01-KCB-MG-CAL-M-30050-2, Glovebox Structural Integrity Qualification – Aqueous Polishing - Homogenization, Sampling and Filling Unit - KCB*GB3000 Pneumatic Transfer Glovebox
DCS-01-KCB-MG-NOM-M-30000-1, KCB - Homogenization, Sampling and Filling Unit – Bill of Materials – KCB*3000 General Assembly
DCS-01-KCB-MG-NOM-M-31000-1, KCB - Homogenization, Sampling and Filling Unit – Bill of Materials – KCB*3000 General Assembly – Glovebox Shell
DCS-01-KCB-MG-NOM-M-33000-0, KCB - Homogenization, Sampling and Filling Unit – Bill of Materials – KCB*3000 General Assembly – Glovebox Standing
DCS01-PRE-CG-SDD-M-05849-2, System Description Document – Pellet Process Area / Pellet Grinding Unit (PRE / PRF)
DCS01-ZMJ-DS-SPE-M-19101-2, Process Equipment Glovebox Design Requirements
DCS01-ZMJ-DS-SPE-M-19102-1, Process Equipment Design Requirements
DCS01-ZMJ-DS-NTE-N-65961-0, Acceptable AWS Code Alternatives
DCS019-ZMJ-DS-NTE-N-65955-0, Use of European Steels In Process Equipment for the Mixed Oxide Fuel Fabrication Facility

DCS01-ZJJ-CG-NTE-H-00609-C, Summary of Thermal Design Criteria
DCS01-AAJ-DS-DOB-M-40110-0, Basis of Design for Seismic Systems and Components
DCS01-KCB-CG-SDD-F-06259-2, System Description Document - Aqueous Polishing Homogenization, Filling and Sampling Unit
DCS01-AAJ-DS-DOB-D-40101-2, Design Requirements Document
DCS01-XGA-DS-CAL-B-01072-0, Seismic Floor Response Spectra for BMF and BEG
DCS01-ZMJ-DS-SPE-19105-5, Process Equipment Qualification Requirements
DCS01-AAJ-DS-DOB-V-40106-2, Basis of Design for Heating, Ventilating, and Air Conditioning Systems
DCS01-POE-DS-SDD-V-12258-1, System Description Document for the Process Cells Exhaust (POE) System
DCS01-ZMJ-DS-CGD-M-65809-2, Commercial Grade Item Evaluation for MFFF Process Glovebox Bagport Assemblies and Bags
DCS01-ZMJ-DS-CGD-M-65809-0, Commercial Grade Item Evaluation for MFFF Process Glovebox Bagport Assemblies and Bags
DCS01-ZMJ-DS-CGD-M-65802-1, Commercial Grade Item Evaluation for MFFF Process Glovebox Gloveport Assemblies
DCS01-QGA-DS-SPE-V-15911-1, Procurement Specification Fire Dampers
DCS01-QGA-DS-SPE-V-13503-2, Procurement Specification HEPA Filters, Prefilters, and Roughing Filters
DCS01-QGA-DS-SPE-V-15865-2, Procurement Specification Centrifugal Fan
DCS01-QGA-DS-SPE-V-15910-2, Procurement Specification Dampers
DCS01-ZMJ-DS-CCT-M-40500-1, Procurement Specification for MFFF Process Glovebox Gloveport Assemblies
DCS01-ZMJ-DS-CCT-M-40553-1, Procurement Specification for MFFF Process Glovebox Bagport Ring Assemblies and Bags
DCS01-QGA-DS-SPE-V-15912-2, Procurement Specification Tornado Dampers
DCS01-QGA-DS-SPE-V-15010-1, Construction Specification Section 15010 HVAC Equipment Erection
DCS01-ZMJ-DS-SPE-M-21402-1, Equipment Seismic Qualification Specification
DCS01-ZMJ-DS-SPE-M-19107-5, Process Equipment Welding Requirements
DCS01-ZMJ-DS-NTE-N-65955-0, Use of European Steels In Process Equipment For The Mixed Oxide Fuel Fabrication Facility QL-1a (IROFS)
DCS01-ZMJ-DS-NTE-N-65961-0, Acceptable AWS Code Alternatives QL-1 (IROFS)
DCS01-CCJ-DS-SPE-C-28394, Rev. 0, Electromagnetic Interference (EMI) & Radio Frequency (RFI) Specification
DCS01-EEJ-DS-SPE-E-25106, Rev. 2, Fiber Optic Cable
DCS01-EEJ-DS-SPE-E-25109, Rev. 0, Construction Specification Section 16160 Cabinets and Enclosures
DCS01-EEJ-DS-SPE-E-25118, Rev. 3, 480V Dry Type Transformers
DCS01-EEJ-DS-SPE-E-25130, Rev. 1, 208/120 Volt AC Three Phase Vital Power & Essential Power Inverters
DCS01-EEJ-DS-SPE-E-25202, Rev. 0, Specification for Medium Voltage Electrical Cables
DCS01-EEJ-DS-SPE-E-25226, Rev. 1, Specification for Emergency Motor Control Centers
DCS01-EEJ-DS-SPE-E-25232, Rev. 1, Specification for 480 Volt AC Three Phase Static Uninterruptible Power Supplies
DCS01-EEJ-DS-SPE-E-25236, Rev. 0, Specification for Emergency Diesel Generators
DCS01-EEJ-DS-SPE-E-25332, Rev. 0, Procurement Specification, Emergency Power Distribution Control Panels (Trains A & B
DCS01-WRT-DS-SPE-B-09307, Construction Specification, Section 02316-Excavation, Backfilling, and Compaction for Utilities, Quality Level 1a (IROFS), Rev. 2

DCS01-BKA-DS-SPE-B-09325-4, Mixing and Delivering for Quality Level QL-1a (IROFS) and QL-2 Concrete
DCS01-BKA-DS-SPE-B-09330-5, Placing Concrete and Reinforcing Steel for Quality Level 1, 2, 3, and 4

Drawings:

DCS01-EAB-DS-SCE-E-26002, Sht. 1, Rev. 3, Normal Switchgear 13.8KV Bus 1 (EAA-SWGR1000) & 4.16KV Bus 1 (EAB-SWG1000) One-Line Diagram
DCS01-EAC-DS-SCE-E-26005, Rev. 4, 4.16KV Emergency Bus A Switchgear EAC*SWG1000 One-Line Diagram
DCS01-ECC-DS-SCE-E-26012, Rev. 4, 480 VAC Emerg. Bus A & B Switch Gear (SWGR) ECC*SWG1100 & ECC*SWG2100 One Line Diagram
DCS01-ECC-DS-SCE-E-26063, Sht. 1, Rev. 5, 480 Volt UPS Emergency VHD*UPS0001A/B, 002A/B One-Line Diagram
DCS01-ECC-DS-SCE-E-26063, Sht. 2, Rev. 4, 480 Volt UPS Emergency VHD*UPS0001A/B, 002A/B One-Line Diagram
DCS01-ECC-DS-SCE-C-29015, Sht. 2, Rev. 2, 480 VAC Emerg. Sgwr Bus A ECC*SWG1100, Bkr 1B Main Incoming Breaker Logic Diagram
DCS01-ECC-DS-SCE-C-29015, Sht. 5, Rev. 2, 480 VAC Emerg Sgwr Bus A ECC*SWG1100, Bkr 3A, EEC*MCC1110
DCS01-ECC-DS-SCE-C-29015, Sht. 6, Rev. 2, 480 VAC Emerg Sgwr Bus A ECC*SWG1100, Bkr 3B, EEC*MCC1120
DCS01-ECC-DS-SCE-C-29016, Sht. 2, Rev. 2, 480 VAC Emerg Sgwr Bus B ECC*SWG2100, Bkr 1B Main Incoming Breaker Logic Diagram
DCS01-ECC-DS-SCE-C-29016, Sht. 5, Rev. 2, 480 VAC Emerg Sgwr Bus B ECC*SWG2100, Bkr 3A EEC*MCC2110
DCS01-ECC-DS-SCE-C-29016, Sht. 6, Rev. 2, 480 VAC Emerg Sgwr Bus B ECC*SWG2100, Bkr 3B EEC*MCC21210
DCS01-ECC-DS-SCE-C-29318, Sht. 1, Rev. 4, 480V Emergency Bus A Swgr, ECC*SWG1100, Bkr 1B ECC*SWG1100 Main Incoming Bus Schematic
DCS01-ECC-DS-SCE-C-29318, Sht. 2, Rev. 2, 480V Emergency Bus A Swgr, ECC*SWG1100, Bkr 1B ECC*SWG1100 Main Incoming Bus Schematic
DCS01-ECC-DS-SCE-C-29325, Sht. 1, Rev. 3, 480V Emergency Bus A Swgr, ECC*SWG1100, Bkr 3A ECC*SWG1100 Schematic
DCS01-ECC-DS-SCE-C-29326, Sheet 1 of 2, Rev. 3, 480 VAC Emergency Bus A Swgr. EAC*SWG1100, Bkr. 3B ECC*MCC1120 Schematic
DCS01-EEA-DS-SCE-E-26058, Sht. 1, Rev. 5, 208/120 Volt Essential Power EEA-PNL1000 One-Line Diagram
DCS01-EEA-DS-SCE-E-26058, Sht. 2, Rev. 5, 208/120 Volt Essential Power EEA-PNL1000 One-Line Diagram
DCS01-EEA-DS-SCE-E-26058, Sht. 4, Rev. 1, 208/120 Volt Essential Power EEA-PNL2000 One-Line Diagram
DCS01-EEC-DS-SCE-E-26062, Sht. 1, Rev. 4, 208/120VAC Vital Power EEC*PNL1000 & 2000 One-Line Diagram
DCS01-EEJ-DS-PLI-E-27922, Rev. 2, MOX Fuel Fabrication Facility BSR Electrical Equipment Rooms D-202, D-210, D-211, D-214, D-215, D-217, D-218 Equipment plan
08716-10888-P-00002664-0030-D, MOX Fuel Fabrication Facility – Release 2, BAP Area, Precast, Topping Slab BTWN 3.9 & 4.8 and C & F, EL 0-0 (Pours F101, F102 & F104)
DCS01-BMF-DS-PLF-B-01352, MOX Fuel Fabrication Facility, BMF Area, Concrete and Reinforcing, General Notes, Rev. 14, Sheet 1 of 3

DCS01-BMF-DS-PLF-B-01352, MOX Fuel Fabrication Facility, BMF Area, Concrete and Reinforcing, General Notes Rev. 0, Sheet 3 of 3
DCS01-BMF-DS-PLS-B-21778, Quality Level 1A – IROFS, MOX Fuel Fabrication Facility, BSR Area, Embedded Plate Location, Plan at El. 23'-4", Rev. 1, Sheet 1 of 13
DCS01-BMF-DS-PLF-B-03362, Quality Level 1A – IROFS, MOX Fuel Fabrication Facility, BSR Area, Concrete and Reinforcing, Plan at El. 23'-4", Rev. 4, Sheet 1 of 1
DCS01-BMF-DS-PLF-B-03384, Quality Level 1A – IROFS, MOX Fuel Fabrication Facility, BSR Area, Concrete and Reinforcing, Intermediate Elev. D.5.1, E.6.1, F.6.3, Rev. 4, Sheet 1 of 3
Condor Rebar Consultants, Inc. Vendor Drawings: 4010 Rev. 1

MOX Vendor - Flanders Drawings

Flanders, DWG No. 200001822 Rev. A, NBX/NBY 1K Base Blank Weldment
Flanders, DWG No. NBXMG-PLDM11202-0100Y Rev. A, Weldment Mounting Member

Receipt Inspection Reports

QC-RIR-09-6213, 2/C 16 AWG Wire, Rockbestos Wire & Cable, CAT ID 4716, Reel No. 090205-035
QC-RIR-09-6271, 2/C 18 AWG Wire, Rockbestos Wire & Cable, CAT ID 4718, Reel No. 090220-125
QC-RIR-10-8848, dated 01/29/2010, 1/C 350 KCMIL Cable, Rockbestos Wire & Cable, CAT ID 8666, Reel No. 100104-042

Audit Reports

Audit Plan SA-09-A05, dated August 18, 2009, Engineering
Audit Plan SA-09-A06, dated August 24, 2009, Software Design Group
Audit Report NII-08-VE07, dated July 2, 2008, Nutherm International, Inc (NII)
Audit Report NLI-08-VE06, dated April 28, 2008, Nuclear Logistics, Inc.
Audit Report SA-09-A05, dated December 23, 2009, Engineering and Document Control
Audit Report SA-09-A06, dated November 16, 2009, Software Design Group Software Development
SME-10-VE149, Supplier Evaluation Summary Report, dated 4/12/10
MOX Audit Report FFI-08-VE143, Flanders Filters Inc., dated January 19, 2009
MOX Assessment Report FFI-10-VS-171, Flanders CSC Inc., dated June 10, 2010
NIAC Audit #14011 (Doosan Heavy Industries & Construction Co. #QA-09-304), Vendor Audit of Dubose National Energy Service, dated May 5, 2009
Calibration Services Survey: FARO Technologies Inc., dated April 30, 2010
Commercial Grade Survey Report: Tennessee Rand Inc., dated October 5, 2009
Commercial Grade Survey Report: Continental Field Systems Inc., dated May 28, 2010
Commercial Grade Survey Report: Stroke Herron Testing Laboratories, dated September 8, 2009
NQA-1 Audit: URS Engineering Services – Denver Office, dated June 2, 2010
Flanders Bi-Annual Internal Audit Report: Engineering Department, dated March 19, 2007
Flanders Bi-Annual Internal Audit Report: Engineering Department, dated September 28, 2009

Work Packages:

WP 09-10888-B2272-C-0013, Excavation and Backfilling of Rad Waste Piping

WP 09-10888-C-2697-BMP-W208-C, Release III Exterior Wall, Installation of Forms, Embedded Items, Rebar and Concrete, QL-1

Miscellaneous Documents

QC-RIR-09-7496 (Receipt Inspection Report PAR GB1000 / PAD GB1000)
NCR-QC-09-1062 (for QC-RIR-09-7496)
QC-RIR-09-7642 (Gloveport Assemblies)
QC-RIR-09-7716 (Bagport Assemblies)
QC-RIR-09-7496 (PAD Glovebox)
Robatel Welding Monitoring – Report of Examination, FSS 1/2/1
Robatel Sheet 1 of WPS for GTAW
Robatel P.O. 112033 for weld filler metal
Pourquery Laboratory CMTR-No. LQ03928/Q10904/0
Robatel Welder Qualification Record PP and RH
CEP Industries RT Report No. 185/02
Approved Suppliers List, Rev. 81
QA Audit Report AWV-10-VE130
CEP Industries RT Report No. 185/02
10888-R-24244, dated June 23, 2009, Proposal evaluation checklist for Emergency Power Distribution Panels
10888-R-24415, Emergency Diesel Generators
DCS01-EEJ-DS-CAL-E-25093, Rev. 11, MFFF Electrical Distribution System Calculation
DCS01-AAJ-DS-DOB-E-40111, Rev. 3, Basis of Design for Electrical Systems
DCS01-EEJ-DS-PVR-E-25042, Rev. 0, Extent of Condition Report for CR20090142, 20090144, 20090146, 20090162, 20090163, & 20090169
EE006-1, Technical Evaluation & Final Technical Review Information
NLI-QS-18040 Technical Proposal
NLI-QS-18138-3, dated September 23, 2009, Quotation for Emergency Power Distribution Control Panel Specification
DCR 09-0393, dated 02/22/2010, Redistribution of Electrical Loads
Lesson Plan, ENGR 2000, dated 10/05/2009, Design Requirements & Documentation
Lesson Plan, LP-ENG-2011, dated 02/11/2010, New to Nuclear
S&ME Field Density Report No. 45348, dated 5/11/10
S&ME Field Density Report No. 45377, dated 5/12/10
S&ME Field Density Report No. 45534, dated 5/24/10
S&ME Grain Size Distribution Test Report No. 44752, dated 4/7/10
Troxler Model 3430 Calibration Report, Calibration date 10/07/09

MOX Vendor – Flanders Procedures Reviewed

CP-01-001, Quality Assurance Levels, Rev.0
CP-01-002, Implementing 10 CFR 21, Rev. 0
CP-01-003, Reporting and Documenting Nonconforming Items, Rev. C
CP-01-005, Flanders Procedures and Work Instructions, Rev. 0
CP-01-006, Document Control, Rev. 0
CP-02-001, Qualification and Certification of NDT Personnel, Rev. A
CP-02-002, Training, Qualification, and General Guidelines for Auditing, Rev. A
CP-02-004, Identification, Control & Storage of Flanders Quality Assurance Records, Rev. A
CP-08-003, Commercial Grade Item Dedication, Rev. 0
CP-05-001, Receiving, Inspecting & Storing Purchased Materials & Items, Rev. B

CP-10-001, Handling of Materials & Items Rev. B
CP-14-001, Purchase Order Control, Rev. 0
CSC-WP-03, General Welding Practices for Cleaning, Welding and Weld Repair of 300 & 400 Series Stainless Steel, Rev. 1
JS-MOX-001, Commercial Grade Item Dedication for MOX Projects, Rev. C
JS-MOX-002, Visual Inspection of Welds, Rev. 0
JS-MOX-003, Liquid Penetrant Examination, Rev. 0
JS-MOX-005, Control of Weld Filler Material for MOX projects, Rev. B
JS-MOX-009, Cleaning, Passivation and Pickling, Rev. B
JS-MOX-010, Ultrasonic Inspection Procedure, Rev. 1
JS-MOX-011, Mechanical Penetration Testing, Rev. 0
JS-MOX-013, Control of Tools and Temporary fasteners for the MOX Projects(s), Rev 0
JS-MOX-014, I/P Shop Inspection & QC Final Dimensional, Surface Finish Inspection, Rev. 0
WI-02-006, Control of Safety Related Orders, Rev. 0
WI-02-007, Qualification of Inspection and Test Personnel per NQA-1, Rev. A
WI-04-008, Welding Machine Calibration, Rev. A
WI-06-001, Issuing Material, Parts or Items, Rev. A
WI-08-002, Design Control for Supplemental Control Jobs, Rev. 0
WI-08-005, MOX Glovebox: Steps for Creating File, Checking In, Itemizing and Releasing ECNs, Rev. A

Purchase Order Documents

Flanders PO #658, Phoenix Metals Co., dated March 15, 2010
Flanders PO #750, Dubose National Energy (NES) Inc., dated March 29, 2010
Flanders PO #801, Phoenix Metals Co., dated May 26, 2010
Flanders PO #803, Ken-Mac Metals Inc., dated March 25, 2010
Flanders PO #863, Ryerson Tull, dated March 26, 2009
Flanders PO#1095, URS Energy & Construction Inc., dated June 10, 2010
Flanders PO# 2655 A572 Grade 50 Steel, dated June 7, 2010
Flanders PO #2877, Ryerson Tull, dated June 14, 2010
Flanders PO# 110518 Weld Filler metal Heat No. 738975, dated 1/14/10
Flanders PO #109513, Ryerson Tull, dated June 12, 2010
Flanders PO #109650, National Specialty Alloy, dated July 10, 2009
DCS BOA #10888-B-2767, TOR #001, Cost Account #5491504, WBS #34435011, dated February 9, 2009
DCS BOA #10888-B-2767, TOR #002, Cost Account #5491504, WBS #34435011, dated June 2, 2009
DCS BOA #10888-B-2767, TOR #003, MOX Service Prime Contract #DE-AC02-99CH1088, dated September 21, 2009
DCS BOA #10888-B-2767, TOR #005, MOX Service Prime Contract #DE-AC02-99CH1088, dated September 21, 2009
DCS01-KCB-AG-SOW-M-50069-1, Homogenization, Sampling and Filling Unit (KCB*GB2000*GB3000*GB4000*GB7000) Statement of Work, QL1 Glovebox Shell and Ventilation, dated September 25, 2008

Commercial Grade Dedication

CGD Worksheet for PO #658, F/CSC Part #10000018, CGIE: DCS01-ZMJ-DS-CGD-M-65858-2
CGD Worksheet for PO #801, F/CSC Part #10000585, CGIE: DCS01-ZMJ-DS-CGD-M-65858-2

CGD Worksheets for PO#803, F/CSC Part#100000535, CGIE: DCS-01-ZMJ-DS-CGD-M-65858-2
CGD Worksheets for PO#863, F/CSC Part#10000022, #100000636, #100001634, CGIE: DCS-01-ZMJ-DS-CGD-M-65858-2
DCS01-ZMJ-DS-NTE-N-65973-2, Technical Basis for Generic Critical Characteristics for Acceptance for QL-1 Materials and Purchased Parts for the MFFF, Rev. 2
DCS01-ZMJ-DS-CGD-M-65858-2, Commercial Grade Item Evaluation for Ferrous Steel Material for Gloveboxes and Subassemblies, Rev. 2

MOX Vendor - Flanders Corrective Action Requests (CARs) Initiated

CAR No. 56, Weld fit-up & cleaning hold point inappropriately signed, dated June 22, 2010
CAR No. 57, Infrared thermometers used for preheat and interpass temperature not in M&TE program, dated June 23, 2010
CAR No. 58, NBY 1000 base plate welds failed visual examination, dated June 24, 2010
CAR No. 59, GTAW welding outside of WPS current / Filler rod size requirements, dated June 24, 2010
CAR No. 60, Weld map 200001822 incorrectly filled out, dated June 24, 2010
CAR No. 61, Symmetrical weldment with potential loss of tractability, dated June 24, 2010
CAR No. 62, Production travelers without clear hold points, dated June 24, 2010
CAR No. 63, Lack of procedural requirement for grinding wheel composition, dated June 24, 2010

MOX Vendor - Flanders Other Documents Reviewed

Quality Assurance Manual, Rev. 4; QAM-4
Production Traveler, EP NBX 02 GB1000
Mill Test Report for A572 Steel, heat No. 0500462
Test Certificate for A572-50 Steel, Heat No. E9F029
Welder Performance Qualification Record for welder No. 207
Welder Qualification continuity record for welder No. 361
Welding Procedure Specification No. WP-15 Rev. F
Welding Procedure Specification No. WP-38-1 Rev. 0
Welding Procedure Qualification Record No. 15
Welding Procedure Qualification Record No. WP-38
Weld Filler Control Audit Checklists for 6/22/10, 6/18/10, 6/17/10, and 6/15/10
NDT Personnel Qualification Records, Rev. C
NDT Personnel Qualification Record – LT, Rev. A

MOX, Other Documents Reviewed

Assessment Report FFI-10-VS-171 – Flanders CSC, Inc.