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

July 26, 2011

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

SUBJECT: MIXED OXIDE FUEL FABRICATION FACILITY- NRC INSPECTION REPORT NO. 70-3098/2011-002

Dear Mr. Trice:

During the period of April 1 through June 30, 2011, 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 this inspection, no violations or deviations were identified.

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

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

Sincerely,

/RA/

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

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

Enclosure: NRC Inspection Report 70-3098/2011-002 w/attachment

cc w/encl: (See next page)

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SIGNATURE	**Via Email**	Via Email	Via Email	Via Email			
NAME	W Gloersen	M. Shannon	B. Adkins	Carl Jones			
DATE	7/25/2011	7/25/2011	7/25/2011	7/26/2011			
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cc w/encl:
Mr. Clay Ramsey, Federal Project Director
NA-262.1
P.O. Box A
Aiken, SC 29802

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

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

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

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

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

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

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

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

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

Letter to Kelly Price from Deborah A. Seymour dated July 26, 2011.

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U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.:	70-3098
Construction Authorization No.:	CAMOX-001
Report No.:	70-3098/2011-002
Applicant:	Shaw AREVA MOX Services
Location:	Savannah River Site Aiken, South Carolina
Inspection Dates:	April 1 – June 30, 2011
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 G. Crespo, Senior Construction Inspector, Construction Inspection Branch 1 (CIB1), Division of Construction Inspection (DCI), RII D. Terry-Ward, Construction Inspector, CIB1, DCI, RII C. Jones, Senior Construction Inspector, CIB1, DCI, RII R. Mathis, Construction Inspector, CIB1, DCI, RII
Accompanying Personnel:	C. Storms, Center for Nuclear Waste and Regulatory Analyses (CNWRA)
Approved by:	D. Seymour, Branch Chief, CPB1, DCP

Enclosure

EXECUTIVE SUMMARY

Shaw AREVA MOX Services
Mixed Oxide (MOX) Fuel Fabrication Facility (MFFF)
NRC Inspection Report No. 70-3098/2011-002

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. The inspections included a review of the engineering processes and design documents developed using the Electrical Transient Analysis Program (ETAP) conducted during April 18-21 and an inspection of engineering and construction activities associated with electrical cables and raceways (Principal System, Structure, and Component (PSSC)-012 and PSSC-015) conducted during June 13-17. This included, as applicable, the following inspection attributes: design control; control of materials, equipment, and services; inspection, problem identification, resolution, and corrective action; and mechanical components. 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 PSSCs discussed in this inspection report include: PSSC-009, Criticality Control; PSSC-012, Emergency AC Power System; PSSC-015, Emergency DC Power System; PSSC-023, Process Vessels and Pipes; and PSSC-036 MOX Fuel Fabrication Building Structure (including vent stack).

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)

Routine inspections were conducted by the resident inspectors from April 1 – June 30, 2011. The inspections involved the observation and evaluation of the applicant's programs for facility construction of PSSCs and included non-PSSC related activities related to control of materials, equipment and services; inspection, problem identification, resolution, and corrective action; and mechanical components. 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)

PSSC Related Inspections

PSSC-009 (Criticality Control)

MOX Services adequately verified criticality requirements of the rod storage racks during fabrication and receipt inspection. No findings of significance were identified. (Section 3.a.(1))

MOX Services properly installed the neutron absorber panels in accordance with MOX Services specifications and American Welding Society (AWS) code requirements. No findings of significance were identified. (Section 3.a.(2))

PSSC-012 (Emergency Alternating Current Power System) and PSSC-015 (Emergency Direct Current Power System)

The applicant properly employed design and documentation control requirements related to the implementation of the Electrical Transient Analysis Program (ETAP). The applicant's engineering staff adequately tracked ongoing development of this work. No findings of significance were identified. (Section 3.b.(1))

MOX Services properly categorized the quality level of Nuclear Incident Monitoring System (NIMS) fiber optic cables in a manner that was consistent with the safety significance of the function performed by the cables. No findings of significance were identified. (Section 3.b.(2))

MOX Services properly applied the Quality Assurance Program Description (QAPD) requirements to the specification and verification of detailed design for sizing, selection, and routing of electrical cables and raceways. The applicant's engineering staff adequately tracked ongoing development of this work. No findings of significance were identified. (Section 3.b.(3))

MOX Services adequately translated applicable technical and quality requirements into finalized procurement specifications. In addition, measures for receipt, storage, issuance, and handling of electrical components met applicable requirements. No findings of significance were identified. (Section 3.b.(4))

PSSC-023 (Process Vessels and Pipes)

MOX Services performed welding activities in accordance with MOX Services welding specifications and AWS code requirements. No findings of significance were identified. (Section 3.c.(1))

The inspectors concluded that the piping material met the requirements of the MOX Services material specification for 304L piping material as well as American Society of Mechanical Engineers (ASME) SA-312. No findings of significance were identified. (Section 3.c.(2))

The inspectors concluded that MOX Services properly installed the concrete anchor bolts for CHP-TK2314/2305. No findings of significance were identified. (Section 3.c.(3))

PSSC-036 (MOX Fuel Fabrication Building Structure (including vent stack))

Construction activities related to PSSC-036 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, rebar installation, placement of concrete, welding, non-destructive testing, installation of tanks, assembly of gloveboxes 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 3.d.(1))

The inspectors concluded that the redesign of MOX Process building (BMP) T.1 line shear wall (W-317) and its impact on the connected structural components was satisfactory. The review included a evaluation of the recently revised structural analysis and design methodology, review of the structural analysis of BMP T.1 line shear wall W317 and floor slab F305, evaluation of the redesign of BMP T.1 line shear wall W317 and floor slab F305, review of the methodology for demolition of floor slab F305, and review of the methodology for reconstruction of floor slab F305 and reconstruction of T.1 line shear wall W317. No findings of significance were identified. (Section 3.d.(2))

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, elevated floors, and roof of the Mixed Oxide (MOX) Process Building (BMP), Aqueous Polishing Building (BAP), and the Shipping Receiving Building (BSR). MOX Services continued installation of Quality Level (QL)-1 tanks during this inspection period. Fifty-eight tanks had been installed at the time of this inspection. The applicant continues with the application of coatings on the walls and ceilings of the BMP and BAP lower level rooms and hallways. Other construction activities included installation of process piping and supports in the BAP, installation of ventilation system ductwork and supports in the BAP and BMP, installation of cable trays (temporary supports), and installation of rod storage rack neutron absorber shield panels.

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

a. Scope and Observations

The inspectors routinely attended the applicant's construction plan-of-the-day meetings and civil engineering meetings. The inspectors routinely held discussions with Shaw AREVA MOX Services' (MOX Services) design engineers, field engineers, quality control/assurance personnel, batch plant personnel, steel workers, 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 various work sites. 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.

The inspectors noted that MOX Services significantly improved the overall housekeeping and cleanliness of the BMP and BAP including the posting of areas to prevent tobacco use, eating, and drinking in areas where safety-related equipment is stored or installed.

b. Conclusions

Construction activities, as noted in Section 2.a, were performed in a safe and quality related manner and in accordance with procedures and work packages. No findings of significance were identified.

3. PSSC Related Inspections

a. PSSC-009 (Criticality Control)

(1) Control of Material, Equipment and Services Attribute (IP 88109, Inspection, Test Control, and Control of Measuring Equipment)

(a) Scope and Observations

The inspectors selected the rod storage racks as an inspection sample for verification of PSSC-009, Criticality Control. The inspectors reviewed DCS01-STK-CG-CAL-H-06391-0, Criticality Safety of the Rod Tray Store, to identify the nuclear criticality safety requirements applicable to the rod storage racks. The inspectors reviewed completed dimensional inspection reports and laboratory test reports contained in Receipt Inspection Report (RIR) QC-RIR-10-1095 to determine if MOX Services performed the necessary inspections and tests to verify that the requirements established in the nuclear criticality safety evaluation (NCSE-D) were adhered to. Specifically, the inspectors reviewed laboratory test reports that measured the density, hydrogen content, and boron content of the neutron absorber shield panel material. The inspectors also reviewed Design Change Request (DCR) 09-352 and DCR 09-356, which permitted the use of a lightweight mixture of mortar, concrete, and boron powder in lieu of borated polyethylene plaster as described in the NCSE. The inspectors discussed this change with MOX Services and were informed that the NCSE-D was currently undergoing a revision to replace neutron absorption control with moderation control as a controlled parameter for the prevention of criticality in the rod storage rack. MOX Services had documented this change in vendor NCR# 5941.

(b) Conclusion

MOX Services adequately verified criticality requirements of the rod storage rack during fabrication and receipt inspection. No findings of significance were identified.

(2) Inspection Attribute Installation (IP 55050, Nuclear Welding General Inspection Procedure, and IP 88136, Mechanical Components)

(a) Scope and Observations

The inspectors observed installation of the wall-mounted neutron absorber panels adjacent to the STK rod storage racks. The inspectors reviewed work package 11-CP24-B186-STK-M-0001 to determine if the work package contained the necessary pre-requisites and work steps to adequately execute the scope of work. The inspectors observed welding of structural supports and installation of shield panels including mounting brackets. The inspectors verified that the weld size met the minimum size called out on the design drawing. The inspectors verified that the welder used the correct weld filler metal material as identified on the weld procedure specification (WPS). The inspectors verified that the filler metal was properly stored in accordance with American Welding Society (AWS) code requirements. The inspectors verified that the voltage, current, travel speed and polarity was consistent with the WPS. The inspectors observed concrete repair activities around the perimeter of the embedded plates used to support the shield panels. MOX Services identified areas of concrete spalling that required repair prior installation of the shield panels.

(b) Conclusion

MOX Services properly installed the neutron absorber panels in accordance with MOX Services specifications and AWS code requirements. No findings of significance were identified.

b. PSSC-012 (Emergency AC Power System), and PSSC-015 (Emergency DC Power System)

(1) Design Control Attribute (IP 88107, Quality Assurance: Design and Documentation Control (Pre-Licensing and Construction))

(a) Scope and Observations

Shaw/AREVA MOX Services used Electrical Transient Analysis Program (ETAP) to perform alternating current (AC) and direct current (DC) short circuit analysis and underground duct bank design and feeder sizing. ETAP was also used to verify cable sizes, battery sizes, battery discharge profile, and equipment ampacity ratings by performing load flow analyses.

The inspectors reviewed the applicant's process for control of design inputs into ETAP to determine that documentation, review, and approval commitments were met. The inspectors compared design input one-line diagrams against ETAP generated diagrams to determine the accuracy of input information and the manner in which differences were tracked within the body of the Electrical System Calculations. The inspectors reviewed verification processes used by the applicant based on MOX Services' Project Procedures (PP) PP9-3, Design Control, including samples of Form PP9-3A, Final Design Confirmation Checklist, and Form PP9-3C, Design Verification Review and Summary, for document DCS01-EEJ-DS-CAL-E-25093, Revision (Rev.) 13, MFFF Electrical Distribution System Calculation. The inspectors reviewed the applicant's process for developing engineering calculations using PP9-6, Engineering Calculations, and the manner in which these processes were applied to the MFFF Electrical

Distribution Systems Calculation. The inspectors reviewed samples of calculations on underground feeder sizing, short circuit calculations, load flow analyses, battery manufacturer data uploading, battery discharge calculations, aboveground feeder sizing verification, voltage drop calculations, and diesel harmonics analysis. The inspectors reviewed the applicant's design change control program to determine if design changes were controlled in accordance with Quality Assurance Program Document (QAPD) commitments and requirements. The inspectors noted that the applicant will not finalize the circuit breaker and fuse time current curve library in ETAP until procurement of these devices is completed, thereby providing the most accurate and up-to-date information.

(b) Conclusion

MOX Services properly applied the QAPD requirements related to the use of the ETAP to adequately develop design calculations and verification results. The applicant's engineering staff adequately tracked ongoing development of this work. No findings of significance were identified.

(2) Quality Assurance Attribute (IP 88106 Program Development and Implementation (Pre-Licensing and Construction))

(a) Inspectors reviewed the finalized engineering specification for procurement of fiber optic cable as detailed in DCS01-EEJ-DS-SPE-E-25106-2. The review was performed to determine if the applicant had identified proper safety significance for the component, and to verify it had been properly categorized for quality classification. In addition, the inspectors reviewed the specification to determine whether NRC requirements and licensing document commitments were properly translated into the detailed design standard.

The fiber optic cable addressed by specification DCS01-EEJ-DS-SPE-E-25106-2 included cable to be used in the Nuclear Incident Monitoring System (NIMS). MFFF has designated the NIMS to perform the criticality accident monitoring and alarm function prescribed by 10 CFR 70.24. Construction Application Request (CAR) 6.4, Design Bases for Principal SSCs, identifies the design criteria for the criticality accident alarm system (i.e. NIMS), and states that all of the provisions of American National Standards Institute (ANSI)/American Nuclear Society (ANS)-8.3-1997, Criticality Accident Alarm System, represent part of the design bases for the MFFF process and fissile material handling and storage areas.

A review of specification DCS01-EEJ-DS-SPE-E-25106-2, drawing DCS01-NIM-DS-SCH-C-30926, and interviews with the applicant's nuclear engineering staff determined that although the NIMS provides a significant life safety function, the portion of the system served by the fiber optic cables provided less significant functions, including equipment status monitoring and system maintenance. The inspectors noted that specification DCS01-EEJ-DS-SPE-E-25106-2 conservatively classified the fiber optic cables as QL-1, and imposed appropriate quality and technical requirements upon the cable supplier.

(b) Conclusion

The applicant properly categorized the quality level of the NIMS fiber optic cables in a manner that was consistent with the safety significance of the function performed by the cables. No findings of significance were identified.

(3) Design Control, Procedures, Quality Assurance Attributes (IP 88137 Electrical Cable)

(a) Scope and Observations

The inspectors reviewed the applicant's use of the Edison software platform to translate the licensing document commitments into the detailed design. The review involved use of the Edison system to execute a number of sample operations which provided design documents for cable and raceway sizing. The phase conductor sizing outputs were properly developed and the routing information was complete and properly documented.

The inspectors reviewed the applicant's process for developing engineering calculations using PP9-6, Engineering Calculations, and the manner in which these processes were applied to the MFFF Electrical Distribution Systems Calculation. The inspectors reviewed samples of calculations on underground and above ground feeder sizing, and voltage drop calculations. The inspectors reviewed the applicant's design change control program to determine if design changes were controlled in accordance with QAPD commitments and requirements.

(b) Conclusion

MOX Services properly applied the QAPD requirements related to the use of the Edison software platform to adequately develop design calculations and verification results. The applicant's engineering staff adequately tracked ongoing development of this work. No findings of significance were identified.

(4) Design Control, Procedures, Procurement, Quality Assurance Attributes (IP 88138 Electrical Components and Systems)

(a) Scope and Observations

The inspectors interviewed responsible engineers and reviewed finalized engineering procurement specifications to verify that technical requirements detailed or referenced in the MFFF CAR, Basis of Design (BOD), and the MOX Project Quality Assurance Plan (MPQAP) were specified to assure adequate work performance and control.

The review of the following procurement specifications and associated consensus industry standards determined that technical requirements were adequately specified:

- DCS01-EEJ-DS-SPE-E-25148, Variable Frequency Drives as compared to the requirements in IEEE 519-1992, Recommended Practices and Requirements for Harmonic Control in Electrical Power Systems;
- DCS01-EEJ-DS-CCT-E-40560-3, Specification for Facility and Process Unit Electrical Cables Quality Level Drives as compared to the requirements in Institute of Electrical and Electronics Engineers (IEEE)-323, Standard for Qualifying Class 1E Equipment for Nuclear Power Generating Stations; IEEE-383, Standard for Type Test of Class 1E Electric Cables, Field Splices and Connections for Nuclear Power Generating Stations; and IEEE-690, Standard for the Design and Installation of Cable Systems for Class 1E Circuits in Nuclear Power Generating Stations;

- DCS01-EEJ-DS-SPE-E-2514-1, Medium Voltage Metal-Clad Switchgear (Emergency), as compared to the requirements in American Society of

Mechanical Engineers (ASME)/ANSI NQA-1-1994, Quality Assurance Requirements for Nuclear Facility Applications, and IEEE C37.20.2-1999, Standard for Metal-Clad Switchgear.

A review of Final Technical Review (FTR Form 9-9A) 10888-R-24106, General Service Pumps, verified that the applicant adequately documented the completion of a final technical review of procurement specification DCS01-EEJ-DS-SPE-E-25148. Document Package Review/Comment Sheet (Form 10-13H) for Subcontract # 10888-P-4174 and 10888-P-4217 were also reviewed to verify proper controls were in place to assure that finalized procurement specifications were used in awarding procurement contracts.

The inspectors also conducted direct inspections of the warehouse facility to verify that received and staged cables were controlled and that measures were established to prevent inadvertent use of nonconforming items. The inspectors interviewed responsible personnel, examined inspection records, and viewed the associated cables in stores to verify the purchased items conformed to specified requirements, the acceptance status of cables was clearly identified, and the cables were protected against damage or degradation.

(b) Conclusion

Technical requirements were adequately included in procurement specifications for electrical components. Controls for receipt, handling, storage, and issuance of electrical components met quality requirements. No findings of significance were identified.

c. PSSC-23, Process Vessels and Pipes

(1) Installation Attribute (IP 88150, Structural Welding General Inspection Procedure & IP 88135)

(a) Scope and Observations

The inspectors observed welding of Fluid Transport System (FTS) piping supports in the BAP. Specifically, the inspectors observed welding of pipe support C141-PS-00077-FW003-C0R0 contained in Work Package 10-CP27-C141-ZMS-S-M-003A. The inspectors verified that the correct weld process, polarity, and filler metal were used as specified in WPS D1.6-GT-A-B-01. The inspectors verified that the tungsten electrode was the correct size and the amps, voltage, weld travel speed, and shield gas flow rate were per the WPS. The inspectors verified that the weld size was correct per the design drawing. The inspectors verified that the tools used were marked for stainless steel use only to prevent corrosion and cross-contamination between carbon steel and stainless steel.

(b) Conclusion

MOX Services performed welding activities in accordance with MOX Services welding specifications and AWS code requirements. No findings of significance were identified.

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

(a) Scope and Observations

The inspectors reviewed completed receipt inspection records for FTS QL-1 piping (304L material) to determine if the piping was procured, fabricated, and tested in accordance with the requirements of DCS01-KKJ-DS-NTE-L-16272-6, Welded Equipment and Piping General Specification for 304L Stainless Steel Materials; and ASME SA-312, Specification for Seamless and Welded Austenitic Stainless Steel Pipes. The inspectors selected QC-RIR-1-17523 (KCD piping spools) as the sample for this inspection. Specifically, the inspectors verified the following: (1) maximum carbon content did not exceed 0.03%, (2) piping was pickled and passivated after heat treatment, (3) weld repair was not performed on the raw material, (4) intergranular corrosion testing was performed in accordance with American Society of Testing and Materials (ASTM) A 262, Practice A, Oxalic Acid Test for Classification of Etch Structures of Austenitic Stainless Steels, (5) surface finish of the pipe interior was less than 125 micro-inches, and (6) 100% of the piping was subjected to nondestructive testing in accordance with ASME SA 999, Section 22, Specification for General Requirements for Alloy and Stainless Steel Pipe. The inspectors verified that the vendor provided a Certificate of Compliance as required by the MOX Services material specification. The inspectors reviewed the certified material test reports and laboratory test reports to determine if the chemical composition and physical properties of the piping material met the requirements of ASME SA-312, and the MOX Services material specification.

(b) Conclusion

The inspectors concluded that the piping material met the requirements of the MOX Services material specification for 304L piping material as well as ASME SA-312. No findings of significance were identified.

(3) Installation Attribute (IP 88136 Mechanical Components)

(a) Scope and Observations

The inspectors observed installation of CHP-TK2314/2305 in the lower level of the BAP. Specifically, the inspectors observed installation of Hilti concrete anchor-bolts in accordance with PP 11-80, Post-Installed Anchor Installation, and work package 11-CP27-C126-CHP-M-TK2314/2305. The inspectors verified that the anchor type, anchor diameter, total anchor length, embedment depth, and location were in accordance with the design drawings and MOX Services design specification. The inspectors verified that the stop drill bit, setting tool, and hammer drill were correct based on the guidance contained in PP 11-80, Attachment D. The inspectors verified that QC inspectors were present to monitor the work activities and sign-off on Quality Control (QC) hold points. The inspectors noted that reinforcing steel was encountered during drilling of the concrete. The inspectors verified that the abandoned holes were filled in accordance with the design specification and construction procedure. The inspectors observed installation of the anchor using the hammer drill and setting tool.

(b) Conclusion

The inspectors concluded that MOX Services properly installed the concrete anchor bolts for CHP-TK2314/2305. No findings of significance were identified.

d. PSSC-036, MOX Fuel Fabrication Building Structure (including vent stack)

(1) Installation and Test Control Attributes (IP 88132, Structural Concrete)

(a) Scope and Observations

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

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

The inspectors observed routine lifts conducted to position reinforcing steel and embedded plates; installation and removal of concrete retaining walls; and movement of equipment such as generators, pumps, temporary lighting, and toolboxes. The lifts were conducted in accordance with the applicant's procedures. The inspectors reviewed the applicable sections of 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) MFFF Concrete and Reinforcing General Notes, DCS01-01352, Rev. 9 (Sheet 1 of 2); and (2) MFFF 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 evaluated the adequacy of ongoing concrete activities conducted by 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 MFFF building structure.

The inspectors observed various activities prior to and during each major concrete placement. Prior to selected placements, the inspectors selectively checked for proper placement of reinforcing steel, including proper lap splices, supports, and bar spacing, alignment, and proper clear cover. The inspectors selectively checked for proper embed plate placement by observing ongoing surveys, and verified embed plate support

structures were properly restrained; observed placement of embedded piping, installation of piping supports, mounting of piping to supports, installation of galvanic sleeves between piping and supports; and verified cleanliness of the placement area.

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

The inspectors observed that concrete samples were collected at the prescribed frequency and noted that the slump and air content met the acceptance criteria or were appropriately dispositioned with NCRs, and that the concrete test cylinders were collected and temporarily stored per procedure prior to transport to S&ME for curing and later testing. Batch plant operators correctly implemented procedural requirements and were in constant communication with the concrete placement crews. The inspectors reviewed concrete cylinder break test records performed and documented by S&ME. The inspectors noted that the cylinder breaks met the acceptance criteria specified in American Concrete Institute (ACI)-349.

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

April 6, 2011, BMP-W 220.5, BMP Interior Wall, 76 cubic yards
April 7, 2011, BMP-W318.2, BMP Interior Wall, 68 cubic yards
April 14, 2011, BMP-Roof0001.1, BMP Roof, 117 cubic yards
April 19, 2011, BSR-W207/205/208, BSR Interior Walls, 288 cubic yards
April 20, 2011, BMP-W223/209, BMP Interior Wall, 260 cubic yards
April 21, 2011, BAP-W110.4/111.3, BAP Interior Wall, 125 cubic yards
April 27, 2011, BMP-W226.1/224.3, BMP Interior Wall, 49 cubic yards
April 29, 2011, BAP-B168, BAP Beam, 8 cubic yards
April 29, 2011, BMP-W302.3, BMP Interior Wall, 78 cubic yards
May 2, 2011, BAP-B167, BAP Beam, 10 cubic yards
May 5, 2011, BMP-F222, BMP Elevated Floor, 18 cubic yards
May 11, 2011, BAP-W212.1, BAP Interior Wall, 134 cubic yards
May 12, 2011, BMP-W217.9/F306.2/303/308.2, BMP Walls and Floors, 490 cubic yards
May 13, 2011, BAP-W212.2/212.3, BAP Interior Wall, 96 cubic yards
May 18, 2011, BMP-W220.2, BMP Interior Wall, 190 cubic yards
May 19, 2011, BMP-W219B/207B, BMP Interior Wall, 221 cubic yards
May 20, 2011, BMP-W226.2/224.3, BMP Interior Wall, 263 cubic yards
June 8, 2011, BMP Gabion Wall-W003, BMP Gabion Wall, 84 cubic yards
June 10, 2011, BSR-W103B, BSR Interior Wall, 195 cubic yards
June 15, 2011, BMP Gabion Wall-W003.2, BMP Gabion Wall, 41 cubic yards
June 23, 2011, BAP-F201/203, BAP Elevated Floor, 350 cubic yards
June 24, 2011, BSR-F302.2, BSR Elevated Floor, 170 cubic yards
June 28, 2011, BMP-W302.1/R1/R2, BMP Roof, 694 cubic yards
June 30, 2011, BMP-F310/311/312, BMP Elevated Floor, 813 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.

(b) Conclusions

Construction activities related to PSSC-036 as described in Table 5.6-1 of the MFFF CAR were adequately performed and included installations of embedded plates and ground cables, heavy lifts of equipment and supplies, verification of equipment placements by surveys, rebar installation, placement of concrete, welding, non-destructive testing, installation of tanks, assembly of gloveboxes 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.

(2) Installation Attribute (IP 88107, Design and Document Control)

(a) Scope and Observations

The inspectors performed a review of the redesign of BMP T.1 line shear wall (W-317) and its impact on connected structural component. On June 6-16, 2011, an onsite review was conducted on the removal of dowels and redesign and reconstruction of MOX BMP T.1 line shear wall, W317 from line 10 to line 12 at elevation 46 feet (')-10 inches (") to 73'-0". This onsite review also included demolition, requalification/redesign, and reconstruction of segments of BMP floor slab, F305 between line 10 and line 12 that supports shear wall W317. Modifications to the design and construction of shear wall W317 are needed before pouring shear wall concrete because it cannot be qualified as designed due to recent addition of penetrations in this shear wall. As a part of these modifications, MOX Services also revised structural analyses and design methodologies. The onsite review activities included review and assessment of MOX final and draft reports, engineering change requests (ECRs), NCRs, calculation packages, and draft design drawings; technical discussions with MOX staff; and construction site inspection.

This review included the following five areas: (1) revised structural analysis and design methodologies; (2) structural analysis of a subsystem that includes shear wall W317 and floor slab F305; (3) redesign of shear wall W317 and requalification/redesign of floor slab F305; (4) methodology for demolition of segments of constructed floor slab F305 between line 10 and line 12 and removal of dowels of shear wall W317; and (5) methodology for reconstruction of demolished segments of floor slab F305 and shear wall W317.

1) Revised Structural Analysis and Design Methodologies.

ECR-011013, Update to Attachment F&G of DCS01-XGA-DS-CAL-B-01064-01, Revision 2, referenced calculation packages to provide revised structural analysis and design methodologies that included use of more rigorous options of structural design codes and standards than used in the MOX fuel fabrication facility license application. ECR-011013 also included additional features recommended by the MOX Structural Consulting Board. The NRC staff determined that the revised structural analysis and design methodologies were acceptable because they conformed to design codes and standards for nuclear facilities and the structural analysis results provided enhanced prediction of the responses of the designed and as-built structural and foundation systems.

2) Structural Analysis of a Subsystem Including BMP T.1 Line Shear Wall W317 and Floor Slab F305

The three-dimensional subsystem model and the Solver Macro Spreadsheet structural analysis results for the redesign of T.1 line shear wall W317 and requalification/redesign of the floor slab F305 that will support the redesigned shear wall W317 were provided in ECR-012533, Qualification of Walls in BMP from P to W and 9 to 12 at Elevation 46'-10" to 73'-0, BMP Pours W317 and W313, Revision 1; and the referenced calculation packages. The NRC staff found that the selection of the domain for the subsystem consisting of T.1 line shear wall W317, floor slab F305, and the neighboring structural components such as other shear walls and floor slabs, beams, and columns was acceptable because the extent of the domain in all three directions was large enough not to have boundary effects on the analysis results of shear wall W317 and floor slab F305. The staff also found that the modeling details for primary structural components for this analysis such as the mesh size and explicit modeling of penetrations for shear wall W317 and the modeling assumptions for secondary structural components such as use of reduced Young's modulus to account for the effect of penetrations for walls below floor slab F305 were reasonable because they were either better or similar to those used in the license application structural analysis. The boundary conditions used for the subsystem were also similar to those used in the license application Solver Macro Spreadsheet structural analysis.

3) Redesign of T.1 Line Shear Wall W317 and Requalification/Redesign of Floor Slab F305

MOX Services provided information on redesign of T.1 line shear wall W317 from line 10 to line 12 at elevation 46'-10" to 73'-0" in Appendix B of ECR-012533, Revision 1, and the referenced draft design drawings. This redesigned shear wall has a thickness of 18" with a horizontal reinforcement of #6 bars at a center to center spacing of 6" and a vertical reinforcement of #7 bars at a center to center spacing of 6". Stress averaging option of design code, ACI 349-97 was used in the design of T.1 line shear wall W317. The inspectors found that the calculations for the redesign of shear wall W317 was acceptable; however, the adequacy of the detailed design drawings for the redesigned shear wall could not be assessed since they were in draft form at the time of the inspection. The resident inspectors will continue to follow-up on this issue.

Appendix T of ECR-012533, Revision 1, and the referenced draft drawings provided information on requalification of floor slab F305 at elevation 46'-10" with demolition and reconstruction done over 6' wide strips along a significant portion of T.1 line from line 10 to line 12. The contact area to transfer load from shear wall W317 to floor slab F305 along T.1 line from line 10 to line 12 was significantly reduced due to the creation of large openings in the redesigned shear wall W317 thereby creating high shear load on floor slab F305 in areas along T.1 line from line 10 to line 12. Even with the use of the ACI 349-97 stress averaging option, the maximum shear interaction ratio was as high as 0.99 for some load combinations. MOX Services had not reached a conclusion regarding the structural adequacy of the F305 floor slab at the time the inspection was concluded. The resident inspectors will continue to follow-up on this issue.

4) Methodology for Demolition of Floor Slab F305 and Removal of Dowels for Shear Wall W317

ECR-012276, Reconstruction of T.1 Line (BMP W317), Revision 1, and referenced draft drawings provided methodology for demolition of 6' wide strips of floor slab F305 along a significant portion of T.1 line from line 10 to line 12 and removal of dowels for shear wall W317. The demolition of concrete will be done so that no embed plates on the bottom of floor slab F305 and its existing reinforcement are damaged. MOX Services proposed to use a hydro-demolition technique for this purpose. This technique has been used in the industry for controlled demolition of bridges. MOX Services' preliminary draft document, Hydro-demolition ECR-12276 and NCR-2114, provided the step-by-step procedure that will be used for hydro demolition of floor slab F305. This procedure included testing the hydro demolition technique on an 8' x 8' x 1'-6" slab whose reinforcement placement and material properties were comparable to those of floor slab F305. The testing of this slab is expected to facilitate further refinement of the procedure for hydro demolition of floor slab F305 without damaging the embed plates and reinforcement. The resident inspectors will continue to follow-up on this issue.

5) Methodology for Reconstruction of Floor Slab F305 and T.1 Line Shear Wall W317

The reconstruction of demolished floor slab F305 and T.1 line shear wall W317 were discussed briefly in ECR-012276, Reconstruction of T.1 Line (BMP W317), Revision 1, and the referenced draft drawings. The reconstruction technique was further discussed by MOX construction and engineering staff during construction site inspections. The staff found that the proposed reconstruction technique was reasonable and acceptable because it used standard construction methods.

(b) Conclusions

The inspectors concluded that the redesign of BMP T.1 line shear wall (W-317) and its impact on the connected structural components was satisfactory. The review included a evaluation of the recently revised structural analysis and design methodology, review of the structural analysis of BMP T.1 line shear wall W317 and floor slab F305, evaluation of the redesign of BMP T.1 line shear wall W317 and floor slab F305, review of the methodology for demolition of floor slab F305, and review of the methodology for reconstruction of floor slab F305 and reconstruction of T.1 line shear wall W317. No findings of significance were identified.

4. Exit Interviews

The inspection scope and results were summarized throughout this reporting period and by regional inspectors on April 21 and June 20, 2011, and by the senior resident inspector on June 30, 2011. No dissenting comments were received from the applicant. Although proprietary documents and processes may have been reviewed during this inspection, the proprietary nature of these documents or processes was not included in the report.

1. PARTIAL LIST OF PERSONS CONTACTED

MOX Services

H. Baldner, Compliance
A. Berry, Electrical Engineer
I. Bhavsar, Electrical Engineer
A. Burney, Electrical Engineer
E. Chassard, Executive Vice President & Deputy Project Manager
J. Collins, Lead Electrical Engineer
M. Gober, Vice President Engineering
D. Gwyn, Licensing Manager
W. Hennessey, Nuclear Safety Analysis Manager
V. Joshi, Electrical Engineer
A. King, Electrical Engineer
L. Lamb, Vice President Facility Design and Construction
R. Large, Lead Construction Engineer
S. Mikhail, Electrical Engineer
J. Morris, Electrical Superintendent
E. Najmola, Vice President Construction
J. Nicely, Electrical Engineering Consultant
J. O'Dell, Compliance Manager
A. Olorunniwo, Civil/Structural Manager
B. Pemberton, Electrical and I&C Manager
J. Peregory, Quality Control Manager
J. Rose, Construction Electrical Engineer
J. Shipalowski, Lead Electrical Design Engineer
N. Simpson, Compliance Engineer
R. Whitley, Vice President Project Assurance
K. Trice, President and Chief Operating Officer
R. Whitley, Quality Assurance/Control Manager
R. Williams, Electrical Engineer

2. INSPECTION PROCEDURES (IPs) USED

IP 88106	Quality Assurance: Program Development and Implementation
IP 88107	Quality Assurance: Design and Document Control
IP 88108	Quality Assurance: Control of Materials, Equipment and Services
IP 88109	Quality Assurance: Inspection, Test Control, and Control of Measuring and Test Equipment
IP 88110	Quality Assurance: Problem Identification, Resolution, and Corrective Action
IP 88130	Resident Inspection Program For On-Site Construction Activities at the Mixed-Oxide Fuel Fabrication Facility
IP 88132	Structural Concrete Activities
IP 88135	Pipe Supports and Restraints
IP 88136	Mechanical Components
IP 88137	Electrical Cable
IP 88138	Electrical Components and Systems

3. LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

None

4. LIST OF ACRONYMS USED

AC	Alternating Current
ACI	American Concrete Institute
ADAMS	Agency-Wide Document Access and Management System
ANS	American Nuclear Society
ANSI	American National Standards Institute
ASME	American Society of Mechanical Engineers
ASTM	American Society of Testing and Materials
AWS	American Welding Society
BAP	Aqueous Polishing Building
BMP	MOX Processing Building
BOD	Bases of Design
BSR	Shipping and Receiving Building
CA	Construction Authorization
CAR	Construction Authorization Request
CFR	Code of Federal Regulations
CIB2	Construction Inspection Branch 2
CPB1	Construction Projects Branch 1
CR	Condition Report
DC	Direct Current
DCI	Division of Construction Inspection
DCP	Division of Construction Projects
DCR	Design Change Request
DCS	Duke, Cogema, Stone & Webster
ECR	Engineering Change Request
ETAP	Electrical Transient Analysis Program
FTR	Final Technical Review
FTS	Fluid Transport System
IEEE	Institute of Electrical and Electronics Engineers
IP	Inspection Procedure
MFFF	MOX Fuel Fabrication Facility
MOX	Mixed Oxide
MOX Services	Shaw AREVA MOX Services
MPQAP	MOX Project Quality Assurance Plan
M&TE	Measuring and Test Equipment
NCR	Non-conformance Report
NCSE-D	Nuclear Criticality Safety Evaluation-Design
NIMS	Nuclear Incident Monitoring System
NQA-1	NQA-1-1994, Quality Assurance Requirements for Nuclear Facili Applications
NRC	Nuclear Regulatory Commission
PP	Project Procedure
PSSC	Principal System, Structure, and Component
QA	Quality Assurance
QAPD	Quality Assurance Plan Document
QC	Quality Control

QL	Quality Level
QL-1	Quality Level 1
Rebar	Reinforcing bar
RII	Region II
Rev.	Revision
RIR	Receiving Inspection Report
S&ME	Soils and Materials Engineering Inc.
SDR	Supplier Deficiency Report
SSCs	Systems, Structures, and Components
WPS	Weld Procedure Specification

5. LIST OF PSSCs REVIEWED

PSSC-009	Criticality Control
PSSC-012	Emergency AC Power System
PSSC-015	Emergency DC Power System
PSSC-023	Process Vessels and Pipes
PSSC-036	MOX Fuel Fabrication Building Structure (including vent stack)

6. RECORDS AND DOCUMENTS REVIEWED

Drawings

ETAP – The MFFF Electrical Distribution System – Main One Line Diagram printed on 4/18/2011.

ETAP – One Line Diagram – Main=>ECC*MCC1110 Loads (Edit Mode) 480V Emergency Train A MCC-ECC*MCC1110 (no date) printed on 4/21/2011.

ETAP – One Line Diagram – Main=>ECC*MCC1120 Loads (Edit Mode) (no date) printed on 4/21/2011.

ETAP – One Line Diagram – Main=>EEC Train A (Edit Mode) Vital System – Train A (no date) printed on 4/21/2011.

ETAP – One Line Diagram – Main=>EBB Train A (Edit Mode) 125VDC Emergency Train A (no date) printed on 4/21/2011.

DCS01-EAC-DS-SCE-E-26005, QL1 - MFFF 4.16 KV Emergency Bus A SWGR EAC*SWG1000 One Line Diagram, Rev. 6

DCS01-ECC-DS-SCE-E-26012, QL1 - MFFF 480V AC Emergency Bus A & B SWGR ECC*SWG1100 & ECC*2100 One Line Diagram, Rev. 6

DCS01-ECC-DS-SCE-E-26063, QL1 - MFFF 480V U.P.S. Emergency VHD*UPS0001A/B One Line Diagram, Rev. 6

DCS01-ECC-DS-SCE-E-26063, QL1 - MFFF 480V U.P.S. Emergency VHD*UPS0002A/B One Line Diagram, Rev. 5

DCS01-EEJ-DS-SCE-E-26001, QL3 - MFFF Main One Line Diagram, Rev. 8 & 9

DCS01-EEJ-DS-SCE-E-26001, QL1 - MFFF Main One Line Diagram, Rev. 5

DCS01-EBB-DS-SCE-E-26061, QL1 - MFFF 125V DC Power Emergency Train A EBB*SWBD1100 One Line Diagram, Rev. 5

DCS01-EEC-DS-SCE-E-26062, QL1 - MFFF 208/120V AC Vital Power EEC*PNL1000 & 2000 One Line Diagram, Rev. 6

DCS01-EEJ-DS-SCE-E-26000, QL1 - MFFF Generators, Transformers, Disconnect Switches & Transfer Switches Drawing Index, Rev. 2

DCS01-EEJ-DS-SCE-E-26000, QL1 - MFFF 480V AC Power DISTR Panels, 240/120V AC EMERG PWR DISTR Panels, 125V DC Normal Switchboards, and 125V DC NORM & EMERG DISTR PNLS Drawing Index., Rev. 2

DCS01-EEJ-DS-SCE-E-26000, QL1 - MFFF Batteries, Battery Chargers, Inverters, UPS'S, VFD'S and Main Control Panels Drawing Index, Rev. 3

DCS01-ECC-DS-SCE-E-26049, QL1 - MFFF 480V AC Emergency Train A MCC ECC*MCC1110 One Line Diagram, Rev. 9

DCS01-ECC-DS-SCE-E-26050, QL1 - MFFF 480V AC Emergency Train A MCC ECC*MCC1120 One Line Diagram, Rev. 6

DCS01-NIM-DS-SCH-C-30926, Rev. 0, Nuclear Incident Monitoring Architecture, Sheet 1 of 3

DCS01-GRS-DS-PLI-E-27002, QL1 – MOX Fuel Fabrication Facility BMP & BSR Areas Level 1 Grounding Plan, Rev.16

DCS01-GRS-DS-PLI-E-27000, QL1 – Grounding – Embedded Grounding Insert Installation, Rev. 4 (Detail EGG12)
DCS01-GRS-DS-PLI-E-27000, QL1 – Grounding General Notes, Rev. 7

DCS01-GRS-DS-PLI-E-27000, QL4 – Grounding – Motor Grounding Connection, Rev. 2 (Detail EGG35)

DCS01-EEJ-DS-PLI-E-27548, QL-1, MOX Fuel Fabrication Facility – Aqueous Polishing Area Room C-425 & C-432 Conduit Plan, Rev. 0.

DCS01-EEJ-DS-PLI-E-27520, QL-1, MOX Fuel Fabrication Facility – Aqueous Polishing Area Rooms B-215, B-216, B-217 Conduit Plan, Rev. 0.

ETAP Generated One Line Diagram – Main EEC Train A (Load Flow Analysis) (particularly Feeder EECLBN1000301)

ETAP Generated One Line Diagram – Main EEC Train B (Load Flow Analysis) (particularly Feeder EECLYN200101/02 & EECLYN200301)

DCS01-EEJ-DS-PL1-E-27400 R4: Drawing: MOX Fuel Fabrication Facility – Cable Tray General Notes, Symbol & Legend

Calculations

DCS01-EEJ-DS-CAL-E-25093, MFFF Electrical Distribution System Calculation, Revisions 12 & 13 – Quality Level 1

Emergency Diesel Generator Loading – Diagram with load step listing and timing sequence values based on EAB-SWGR1000.

EDISON – Screen Print on Cable ECCLON111001, ECCLON111001G, and WBP-1 covering all aspects provided within the software package.

DCS01-EEJ-DS-CAL-E-25093, MFFF Electrical Distribution System Calculation, QL-1, Rev. 13.

ETAP Study Case: LF-Normal, Voltage Drop Analysis

DCS01-EEJ-DS-CAL-E-25065, QL-1, 120/208Volt Feeder Sizing and Voltage Drop Calculation Rev. B / Superseded by DCS01-EEJ-DS-CAL-E-25093.

DCS01-EEJ-DS-CAL-E-25061, QL-1, MOX Emergency Low Voltage Feeder Cable Sizing and Voltage Drop Calculation Rev. C / Superseded by DCS01-EEJ-DS-CAL-E-25093.

DCS01-EEJ-DS-CAL-E-25025, QL-1, Preliminary Power Cable Sizing for Medium Voltage Distribution System, Rev. 1 / Superseded by DCS01-EEJ-DS-CAL-E-25093.

DCS01-EEJ-DS-CAL-E-25052, QL-1, Emergency Diesel Generator Lead Sizing, Rev. B / Superseded by DCS01-EEJ-DS-CAL-E-25093.

DCS01-EEJ-DS-CAL-E-25060, QL-1, MOX Medium Voltage Feeder Cable Sizing and Voltage Drop Calculation, Rev. 1 / Superseded by DCS01-EEJ-DS-CAL-E-25093

Procedures

PP3-5, Control of Non-Conforming Items, Revision 6

PP9-3, Design Control, Revision 18

PP9-6, Engineering Calculations, Revision 9

PP9-14, Design Process, Revision 6

PP9-16, Basis of Design Documents, Revision 7

MOX Electrical and I&C Desktop Procedure ETAP Change Control ELE-DTI-002 Rev. 0

DCS01-EEJ-DS-NTE-E-25071, Cable Sizing Guideline, QL1, Revision 1

Condition Reports

CR 10888-MOX-CR-11-232

CR 10888-MOX-CR-11-334

CR 10888-MOX-CR-11-343

Other Documents

DCS01-AAJ-DS-DOB-E-40111, NNSA Technical Baseline – Basis of Design for Electrical Systems QL 1, Rev. 3

Genesis Report – Cable Pull Card for cable EECLON100001P

Genesis Report – Cable Pull Card for cable EECLON100001N

DCS-NRC-000274 – Shaw AREVA MOX Services Revised Reply to Notice of Violation, dated May 18, 2010.

DCS01-EEJ-DS-CCT-E-40560-3, Specification for Facility and Process Unit Electrical Cables Quality Level 1, Rev. 3

DCS01-EEJ-DS-SPE-E-25106-2, Fiber Optic Cable, Rev. 2

DCS01-EEJ-DS-SPE-E-2514-1, Medium Voltage Metal-Clad Switchgear (Emergency), Rev. 1

DCS01-EEJ-DS-SPE-E-25148, Variable Frequency Drives Quality Level 1 (QL-1) IROFS, Rev. 2

DCS01-GME-AG-WPK-E-50102: Work Scope Package: Fabricate and Install Groups 1, 2 and 3 cables and Equipment

DCS01-AAJ-DS-DOB-E-40111, NNSA Technical Baseline – Basis of Design for Electrical Systems QL 1, Rev. 3

DCS01-EEJ-DS-SPE-E-25098, Electrical Installation Specification – Section 7.13.6 Terminal Lugs – Bending, Rev. 0

DCS01-EEJ-DS-SPE-E-25202, QL-1, Specification for Medium Voltage Electrical Cables, Rev. 0

ECR-011249, Engineering Change Request, QL-1, Subject: Changes to emergency motor control center one lines. (ECC*MCC1110 and ECC*MCC2110)

DCS01-EEJ-DS-LST-E-50380, QL-1, Raceway Release Report for Room C-432, Rev. 0

ETAP generated Time-Current Curves for ECC*SWGR1100-3A to indicate cable damage to cables ECCLON111001G/02G/03G/04G using 3-phase bolted fault

10888-R-24106, General Service Pumps, Final Technical Review (Form 9-9A)

10888-P-4174, General Service Pumps, Document Package Review (Form 10-13H)

10888-P-4217, Emergency Diesel Generators, Document Package Review (Form 10 13H)

E-mail dated 6/14/2011 @ 11:10 am Subject Line: Cable Reel 101014-064 “PassPort” Screen Shot

QC-RIR-10-1403: RIR Inspection Summary, PO# B1572 Release #006

QC-RIR-10-1426: RIR Inspection Summary

QC-RIR-09-5806: RIR Inspection Summary, PO# B-1572-2, Release #001