



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
SAM NUNN ATLANTA FEDERAL CENTER
61 FORSYTH STREET, SW, SUITE 23T85
ATLANTA, GEORGIA 30303-8931

October 30, 2008

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

SUBJECT: MIXED OXIDE (MOX) FUEL FABRICATION FACILITY- NRC INSPECTION
REPORT 70-3098/2008-003 AND NOTICE OF VIOLATION

Dear Mr. Stinson:

During the period of July 1 through September 30, 2008, the US Nuclear Regulatory Commission (NRC) completed inspections of construction activities related to the construction of the Mixed Oxide Fuel Fabrication Facility (MOX FFF). 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, one violation of NRC requirements was identified regarding the failure to implement Section 3 of the MOX Quality Assurance Plan, Design Control. The violation was evaluated in accordance with the NRC Enforcement Policy available on the NRC's Web site at www.nrc.gov. The violation is cited in the enclosed Notice of Violation (Notice) and the circumstances surrounding it are described in detail in the subject inspection report.

The NRC has concluded that information regarding the reason for the violation, the corrective actions taken and planned to be taken to correct the violation and prevent recurrence, and the date when full compliance will be achieved, is already adequately addressed on the docket in Inspection Report No. 70-3098/2008-003, therefore no response to this letter is required.

If you choose to respond, your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>. Therefore, to the extent possible, the response should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the Public without redaction. In accordance with 10 CFR 2.390 of NRC's "Rules of Practice," a copy of this document 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: 1. Notice of Violation
 2. NRC Inspection Report 70-3098/2008-003 w/attachment

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PUBLICLY AVAILABLE NON-PUBLICLY AVAILABLE SENSITIVE NON-SENSITIVE

ADAMS: Yes ACCESSION NUMBER: ML08350388 SUNSI REVIEW COMPLETE

OFFICE	RII:DCP	RII:DCP	RII:DCP	RII:DCI	RII:DCI	NMSS:FCSS	
SIGNATURE	WBG	Via Email	Via Email	Via Email	Via Email	Via Email	
NAME	WGloersen	MShannon	MSheikh	JCalle	RJackson	PBell	
DATE	10/30/2008	10/28/2008	10/27/2008	10/30/2008	10/30/2008	10/30/2008	
E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	

D. Stinson

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cc w/encl:

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Letter to D. Stinson from Deborah A. Seymour dated October 30, 2008.

SUBJECT: MIXED OXIDE (MOX) FUEL FABRICATION FACILITY- NRC INSPECTION
REPORT 70-3098/2008-003 AND NOTICE OF VIOLATION

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PUBLIC

NOTICE OF VIOLATION

Shaw AREVA MOX Services
Aiken, South Carolina

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

During NRC inspection activities conducted between July 1 through September 30, 2008, a violation of NRC requirements was identified. In accordance with the NRC Enforcement Policy, the violation is listed below:

Condition 3.A of NRC Construction Authorization No. CAMOX-001 (Revision 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 (MOX) 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 June 20, 2007, and supplements thereto.

MPQAP, Section 3, Design Control, Paragraph 3.2.4.H.1) requires that design reviews shall be performed to ensure that design inputs are correctly incorporated into documents, calculations, drawings, etc.

Contrary to the above, the design reviews performed for base mats BMP 103 and BMP 107 were inadequate in that the reviews did not ensure that design inputs were correctly incorporated into the field drawings. Specifically, the design input for base mats BMP 103 and BMP 107 required the base mat reinforcing steel to be placed on 9-inch centers. This design input was incorrectly incorporated into the field drawings, which improperly specified that the base mat reinforcing steel be placed on 11-inch centers. Field drawings BMP RF-103 and BMP RF-103B had been inadequately reviewed and approved for construction activities on December 1, 2006 (Revision 0) and on February 7, 2007 (Revision 1). Placement of base mat BMP 103 was completed during October 2007, and the placement of base mat BMP107 was completed during March 2008, prior to discovery of the error.

This is a Severity Level IV violation (Supplement II).

The NRC has concluded that information regarding the reason for the violation, the corrective actions taken and planned to correct the violation and prevent recurrence and the date when full compliance was achieved is already adequately addressed on the docket in this letter and as documented in NRC Inspection Report No. 70-3098/2008-003. However, you are required to submit a written statement or explanation pursuant to 10 CFR 2.201 if the description therein does not accurately reflect your corrective actions or your position. In that case, or if you choose to respond, clearly mark your response as a "Reply to a Notice of Violation," and send it to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555 with a copy to the Resident Inspector and the Regional Administrator, Region II, within 30 days of the date of the letter transmitting this Notice.

If you contest this enforcement action, you should also provide a copy of your response, with the basis for your denial, to the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001.

Should you choose to respond, your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/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 CFR 19.11, you may be required to post this Notice within two working days.

Dated at Atlanta, Georgia this 30th day of October 2008.

U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.: 70-3098

Construction
Authorization No.: CAMOX-001

Report No.: 70-3098/2008-003

Applicant: Shaw AREVA MOX Services

Location: Savannah River Site
Aiken, South Carolina

Inspection Dates: July 1 – September 30, 2008

Inspectors: M. Shannon, Senior Resident Inspector, Construction Projects Branch 1
(CPB1), Division of Construction Projects (DCP), Region II (RII)
W. Gloersen, Senior Project Inspector, CPB1, DCP, RII
J. Calle, Senior Construction Inspector, Construction Inspection Branch 2
(CIB2), Division of Construction Inspection (DCI), RII
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(CIB1), DCI, RII
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(CPB3), DCP, RII
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P. Bell, Senior Quality Assurance Engineer, Nuclear Materials Safety and
Safeguards (NMSS), Division of Fuel Cycle Safety and Safeguards,
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Accompanying
Personnel: K. O'Donohue, Chief, CIB2, DCI
D. Seymour, Chief, CPB1, DCP
G. Crespo, RII/CCI/DCI/CIB1
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Approved: Deborah A. Seymour, Chief, CPB1, DCP

EXECUTIVE SUMMARY

Shaw AREVA MOX Services
Mixed Oxide Fuel Fabrication Facility (MOX FFF)
NRC Inspection Report No. 70-3098/2008-003

These routine inspections included activities conducted by specialists from the Region II and Nuclear Material Safety and Safeguards (NMSS) offices during August 25-28, September 8-12, and September 23-25, and by the senior resident inspector from July 1-September 30, 2008. These 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 control; problem identification, resolution, and corrective actions; inspection, control of materials, equipment, and services; management of electronic data; supplier and vendor activities; structural concrete activities; and geotechnical foundation activities.

The scope of this inspection encompassed a review of various MOX facility activities related to Quality Level (QL)-1 construction for conformance to NRC Regulations, the Construction Authorization Request (CAR), 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. Specific areas inspected included process tank receipt, non-conformances regarding commercial grade dedication, procurement specifications and trend analysis programs. The inspection also focused on MOX services' oversight of subcontractor activities. The inspectors reviewed applicable portions of MOX services' QA program to assess the adequacy of the program and whether it has been 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 PSSCs included: installations of reinforcing steel, embedded plates, embedded piping, and facility ground system cables; heavy lifts of equipment and supplies; verification of equipment placements by surveys; welding; non-destructive testing (NDT); receipt of materials; and concrete placements. 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).

Geotechnical/Foundation Activities (IP 88131)

Geotechnical backfill procedures and specifications were found to be adequate. Quality assurance records associated with these activities were properly maintained in accordance with project procedure. No findings of significance were identified (Section 3).

Structural Concrete Activities (IP 88132)

PSSC (structural concrete) construction activities of the MOX Fuel Fabrication Building Structure and QA/Quality Control (QC) oversight related to structural concrete were performed

in accordance with the project procedures and specifications. The QA records reviewed also demonstrated the implementation of the QA program related to structural concrete. The results of the inspection demonstrated the adequacy of the applicant's work related to structural concrete. No findings of significance were identified (Section 4(a)).

The control of concrete quality as measured by the standard deviation and assessed according to American Concrete Institute (ACI) rating criteria was excellent. The specified design strength requirement was always achieved. No findings of significance were identified (Section 4(b)).

Design and Documentation Control (IP 88107)

A violation was identified for failure to ensure that design requirements were correctly selected and incorporated into field drawings. Other design and document controls were being implemented in accordance with the QA program document. Minor drawing discrepancies observed did not lead to significant errors in construction (Section 5).

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

The applicant's process for control of materials, equipment and services as evident in the performance of physical receipt inspections of the conventional tanks were controlled in accordance with quality and technical requirements. No findings of significance were identified (Section 6).

Problem Identification, Resolution and Corrective Action (IP 88110)

The applicant had adequately implemented provisions to address identified problems and required corrective actions. MOX Services project procedures adequately implemented the provisions of the MOX Project Quality Assurance Program (QAP) for Nonconforming Materials, Parts or Components and Corrective Action in addressing inadequate commercial grade dedication of reinforcing steel, embedment piping and embedment plates (Section 7).

10 CFR Part 21, Inspection-Facility Construction (IP 88111)

The applicant had adequately implemented provisions to address identified problems and the required reportability determinations. MOX Services project procedures adequately implemented the provisions of the MOX Project QAP for corrective action in addressing the reportability of the inadequate commercial grade dedication of reinforcing steel, embed piping, and embed plates. The applicant has taken a proactive approach to resolve supplier quality assurance issues. No findings of significance were identified (Section 8).

Control of the Electronic Management of Data (IP 88113)

The applicant had adequately implemented provisions to control access to the MOX Services records storage facility. MOX Services project procedures adequately implemented the provisions of the MOX Project QAP for QA records management and for the permanent storage of QA records. No findings of significance were identified (Section 9).

Supplier / Vendor Inspection (Construction Phase) (IP 88115)

The applicant had adequately implemented provisions to control materials, equipment and services as evident in the performance of supplier evaluations of a prospective vendor for QL-1

reinforced structural steel. MOX Services project procedures adequately implemented the provisions of the MOX Project QAP (Section 10).

Safety Function Interface (IP 88116)

The applicant had established a program and procedures for control of safety function interfaces in the areas of integrated safety, design, procurement, and quality assurance controls in accordance with its CAR requirements, and the applicant's QAP (Section 11).

Attachment:

Persons Contacted

Inspection Procedures

List of Items Opened, Closed, and Discussed

List of Acronyms Used

List of Documents Reviewed

REPORT DETAILS

1. Summary of Facility Status

During the period, the applicant continued construction activities of principle structures, systems, and components (PSSCs) related to building construction up to ground level (Release 1). The applicant completed all of the major base mats associated with the Aqueous Polishing Building (BAP), the Receiving Building (BSR) and the Manufacturing Building (BMP). The applicant also continued Release 2 activities which included multiple inside and outside walls of the BMP and BSR. At the end of the inspection period, the applicant had placed more than 40,000 cubic yards of concrete and had placed more than 34,000 cubic yards of flowable concrete in place of engineered fill. The Mixed Oxide Fuel Fabrication Facility (MOX FFF) project received its first two Quality Level 2 (QL-2) stainless steel process tanks on August 6. The tanks will be stored in the Process Assembly Building until they are installed in the MOX FFF. Other construction activities included installation of the metal roof on the Process Assembly Facility.

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

a. Scope and Observations

During the inspection period, the inspectors observed the following activities:

- (1) installation of structural reinforcing steel in the MOX manufacturing building (BMP), the BAP, and the BSR;
- (2) installation of embedded piping and embedded support plates in all three buildings;
- (3) placements of concrete in base mats for the BMP;
- (4) operation of the concrete batch plants;
- (5) receipt of cement, fly ash, sand and gravel;
- (6) concrete testing in the field (slump, air entrainment, and temperature);
- (7) welding and non-destructive testing (NDT) of piping to be embedded;
- (8) installation of building grounding cables in various base mats and walls; and
- (9) surveys (proper positioning/location) of embedded piping and embedded plates.

In addition, the inspectors verified the following activities: (1) cleanliness of areas prior to concrete placement, and maintenance of cleanliness during the concrete placements; and (2) adequate consolidation of concrete during placement (vibration of concrete) in various base mats and walls.

The inspectors observed routine lifts conducted to position reinforcing steel, embedded piping, embedded plates; installation and removal of concrete retaining walls; and movement of equipment such as generators, pumps, temporary lighting, and toolboxes. The lifts were conducted in accordance with the applicant's procedures.

The inspectors reviewed the applicable sections of the applicant's Quality Assurance (QA) program and verified that the installations of the structural reinforcing steel, embedded plates, embedded piping, and electrical grounding of the MOX structures were in accordance with QA programmatic requirements. Specifically, the inspectors verified that installations were in accordance with applicable field drawings and met the

general construction notes 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 2).

The inspectors routinely attended the applicant's construction plan-of-the-day meetings in order to maintain current knowledge of construction activities. The inspectors also routinely held discussions with MOX Services civil engineers, field engineers, quality control/assurance personnel, US Concrete personnel, Titan steel workers, and Baker Construction personnel in order to maintain current knowledge of construction activities and to maintain current knowledge of any problems and concerns.

The inspectors routinely reviewed the status of work packages maintained at each work site. 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 inspector also observed proper communication in the work areas, observed that the work force was attentive, workers adhered to procedures in effect, 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). The inspectors also reviewed the closure of selected NCRs and CRs. The inspector concluded that the applicant was appropriately identifying conditions adverse to quality in their corrective action systems. 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, was completing 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.

b. Conclusions

Construction activities related to PSSCs included: installations of reinforcing steel, embedded plates, embedded piping, and ground cables; heavy lifts of equipment and supplies; verification of equipment placements by surveys; welding; non-destructive testing; receipt of materials; and concrete placements. 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. Geotechnical/Foundation Activities (IP 88131)

a. Scope and Observations

This portion of the inspection focused on the applicant's implementation of Quality Level 1 (QL-1) backfill activities. The inspection involved discussions with personnel performing backfill activities related to QL-1 structures. The intent of the inspection was to determine if geotechnical activities were accomplished in accordance with the applicants design specifications, drawings, and procedures.

The inspectors reviewed Controlled Low Strength Material (CLSM) specifications and testing procedures to determine the technical requirements associated with the backfill activity. These requirements were used to verify the proper installation of CLSM through the review of pre-placement and compression test records.

b. Conclusions

Geotechnical backfill procedures and specifications were found to be adequate. Quality Assurance (QA) records associated with these activities were properly maintained in accordance with project procedure. No items of safety significance were identified.

4. Structural Concrete Activities (IP 88132)

a. Concrete Placement Activities

(1). Scope and Observations

The inspectors evaluated the adequacy of ongoing concrete activities conducted by Baker, QORE, 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 MOX Fuel Fabrication Building Structure (MFFBS). Table 5.6-1 of the Construction Authorization Request specifies the MFFBS as one of the PSSCs.

The inspectors observed formwork cleanliness and alignment, reinforcing steel installation, and in-process testing of concrete (slump, air content, density, and temperature) related to both placements. The applicant's QA staff was observed conducting testing and surveillance of concrete activities as required by the QA program.

The inspectors observed various activities prior to and during each major concrete placement. Prior to each placement, the inspectors randomly checked for proper placement of reinforcing steel, including proper lap splices, supports, and bar quantity. The inspectors randomly checked for proper embed plate placement by observing ongoing surveys, and verified embed plate support structures were in place; verified cleanliness of the placement area; observed placement of embedded piping, installation of piping supports, mounting of piping to supports, and installation of galvanic sleeve between piping and supports. The inspectors also observed the installation of the grounding system for the reinforcing steel including embedded grounding posts for future equipment installation. The inspectors also noted minimal movement of wall dowels (reinforcing steel) during the placement activities. 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 all placements.

During the concrete placements, inspectors observed operations at the batch plant and at the point of placement. Concrete placement and testing activities were in accordance with procedural requirements. Minor difficulties observed 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 being transported to the off-site materials laboratory for curing and later testing. 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:

- July 1, 2008, Aqueous Polishing Building (BAP) W-4C, BAP Exterior Wall, 650 cubic yards, verified by field drawings BAP-WR-01 and BAP-WR-04.
- July 9, 2008, BAP W-5, BAP Exterior Wall, 630 cubic yards, verified by field drawings BAP-WR-03 and BAP-WR-04.
- July 15, 2008, BMP F-113A/B, BMP Basemat 1,450 cubic yards, verified by field drawing BMP-RF-113, BMP-RF-113A, BMP-RF-113B and BMF-01776.
- July 22, 2008, BMP-W-108A, BMP Interior Wall, 230 cubic yards, verified by field drawing BMP-WR-05, BMP-WR-07, BMP-WR09 and BMP-WR-14.
- July 24, 2008, BMP F-114B/C, BMP Basemat, 1,210 cubic yards, verified by field drawings BMP-RF113, BMP-RF113A, BMP-RF113B, and BMF-01776.
- July 28, 2008, BAP W-6, BAP Exterior Wall, 380 cubic yards, verified by drawing BAP-WR-03.
- July 29, 2008, BSR W-5B1/5B2/5C/5D, BSR Interior Walls, 50 cubic yards, visually observed.
- July 29, 2008, BAP W53B, BAP Exterior Wall, 60 cubic yards, visually observed.
- August 7, 2008, BSR W5A, BSR Interior Wall, 360 cubic yards, (placement not observed)
- August 14, 2008, BSR W-5E, BSR Interior Wall, 30 cubic yards, visually observed.
- August 14, 2008, BMP-F-115A/B, BMP Basemat, 1,330 cubic yards, verified by field drawing BMP RF-111, BMP-RF-111A, BMP-RF-111B and BMF-01776.

- August 19, 2008, BAP W-9-5.2.2 and BAP W-8-5.2.2, BAP Interior Walls, 280 cubic yards and 490 cubic yards respectively, (placement not observed).
- August 20, 2008, BMP W-111, BMP Exterior Wall, 210 cubic yards, (placement not observed) verified by field drawing BMP WR03.
- August 21, 2008, BSR F-101A, BSR Basemat, 1,040 cubic yards, (placement not observed) verified by field drawings BSR-RF-03 and BSR-RF-04.
- August 25, 2008, BMP W-108D, BMP interior Wall, 80 cubic yards, drawing BMP-WR-05, verified by field drawings BMP-WR-07, BMP-WR09 and BMP-WR-14.
- August 28, 2008, BMP- F-121A/B, BMP Basemat, 1,110 cubic yards, verified by field drawings BMP RF-111, BMP-RF-111A, BMP-RF-111B and BMF-01776.
- September 4, 2008, BSR F-101B, BSR Basemat, 1,000 cubic yards, verified by field drawings BSR-RF-03 and BSR-RF-04.
- September 9, 2008, BMP W- 112, BMP Exterior Wall, 270 cubic yards, verified by field drawing BMP-WR-02.
- September 10, 2008, BMP W-109A, BMP Interior Wall, 170 cubic yards, verified by field drawings BMP-WR08, BMP-WR09, BMP-WR18, BMP-WR 20, and BMP-WR 21.
- September 11, 2008, BMP F-122A/B, BMP Basemat, 1,210 cubic yards, verified by drawings BMP RF-113, BMP-RF-113A, BMP-RF-113B and BMF-01776.
- September 17, 2008, BMP F-116A/B, BMP Basemat, 1,000 cubic yards, verified by field drawings BMP BMP RF-113, BMP-RF-113A, BMP-RF-113B and BMF-01776.
- September 19, 2008, BSR F-102A, BSR Basemat, 650 cubic yards, verified by field drawings BSR RF05, BSR RF-06 and BSR RF07.
- September 24, 2008, BMP W-116A, BMP Interior Wall, 110 cubic yards, verified by field drawing BMP-WR14.
- September 24, 2008, BSR F-103, BSR Basemat, 620 cubic yards, verified by drawing BSR RF-04.

MOX Services Construction Specification, DCS01-BKA-DS-SPE-B-09201-2, Concrete Supply, Rev. 2, and DSC01-BKA-DS-SPE-B-09325-4, Mixing and Delivering for Quality Level QL-1a item relied on for safety (IROFS)), and QL-2 Concrete, Rev. 4, were reviewed for adequacy. QA documentation and US Concrete implementation procedures were also reviewed by the inspectors to verify whether activities being performed onsite were in accordance with internal procedures, specifications and NRC regulations.

The inspectors observed one concrete placement during the inspection. This placement was specifically related to pour card 08-10888-C-1609-BAP-W6-C. The work package for this pour was also reviewed to verify required QC inspections were conducted per procedure. The inspectors observed Baker and QORE conduct pre-placement concrete testing (slump test, air content, density, and ambient temperature). MOX QC staff was also observed conducting surveillance of concrete activities, formwork preparation, and reinforcing steel bar installation related to the placement.

The inspectors held interviews with MOX Services staff and contractors. The discussion focused on batch plant certifications, fly ash receipt inspections and concrete mixer truck inspections. The inspectors also discussed the QL-1 mix designs and qualifications with the MOX Services, and Baker representatives.

The inspectors visited the off-site QORE testing laboratory. QORE training and qualification records, testing lab certification, and equipment calibration logs were reviewed. Concrete cylinder compression testing for the most recent QL-1 concrete placement was reviewed by the inspectors. The concrete used in this placement was a 4000 pounds per square inch (psi) strength mix. One 7-day test was conducted which resulted in 4280 psi and two 28-day tests were conducted and resulted in strengths of 5100 and 5300 psi, respectively. The reviewed test results were within allowed specifications.

The inspectors also reviewed procedure PP 3-6, Corrective Action Process, Rev. 10, to evaluate the adequacy of the process associated with problem identification and corrective actions to resolve problems with concrete. Engineering change requests (ECRs), NCRs, and CRs generated by the applicant related to structural concrete were reviewed to verify the proper documentation and resolutions of problems identified on-site. The disposition of the NCRs, ECRs and CRs reviewed by the inspectors were adequately resolved in a timely manner by the applicant.

(2). Conclusions

Through direct observation of PSSC construction activities of the MFFBS and QA oversight related to structural concrete, the inspectors determined work activities were performed in accordance with the project procedures and specifications. The QA records reviewed also demonstrated the implementation of the QA program related to structural concrete. The results of the inspection demonstrated the adequacy of the applicant's work related to structural concrete. No items of safety significance were identified.

b. Concrete Testing

(1). Scope and Observations

The inspectors observed concrete cylinder compression test results for the most recent 28-day old concrete placement. The 28-day compressive strength exceeded the design requirement for all the test results reviewed. The design requirement for the concrete mix reviewed was 4000 psi based on the 56-day compressive strength. The analysis of concrete strength variation over time, conducted in accordance with American Concrete Institute (ACI) Report 214R, Evaluation of Strength Test Results of Concrete, was also reviewed.

(2). Conclusions

The control of concrete quality as measured by the standard deviation and assessed according to ACI rating criteria was excellent. The specified design strength requirement was always achieved. No findings of significance were identified.

5. **Design and Document Control (IP 88107)**

a. Scope and Observations

On July 9, 2008, an NRC technical reviewer was onsite reviewing seismic calculations. During the review, the technical reviewer asked to review the civil (reinforcing steel) design and field drawings related to manufacturing building base mat BMP-F-103. When the applicant obtained the drawings, the applicant noted a deficiency in one of the field drawings in that the design drawing required the reinforcing steel spacing to be on 9 inch centers and the field drawings specified reinforcing steel spacing to be on 11 inch centers.

The field/fabrication drawings in error were provided by Energy and Process (E&P). E&P was responsible for verifying the accuracy of the drawings. In addition, MOX Services engineering personnel were responsible for final review and acceptance of the E&P drawings. In this case, the field drawing was approved; however, the MOX services engineer failed to identify the reinforcing steel spacing deficiency. The field drawings were approved for fabrication of the reinforcing steel and for use in the field on December 1, 2006 (Rev. 0), and again on February 7, 2007 (Rev. 1). The BMP-F-103 base mat was placed on October 10 and 23, 2007, and the BMP-F-107 base mat was placed on March 20, 2008.

The applicant performed an analysis of the manufacturing building and concluded that the design requirements were met in that the design margin was reduced but still well within the design limit even assuming worst case conditions. NRC technical reviewers and inspectors reviewed the applicant's analysis and found it to be acceptable. The applicant correctly revised the design drawings to match the as-built drawings after completing the re-analysis of the BMP structure.

MPQAP, Section 3, Design Control, Paragraph 3.2.4.H.1), requires that design reviews be performed to ensure that design inputs are correctly incorporated into documents, calculations, and drawings. In addition, 10 CFR 50, Appendix B, Criterion III, Design Control, requires the applicant to translate properly design requirements into specifications, drawings, procedures and instructions. The failure by the MOX services civil engineer to identify the drawing error (properly translate design requirements to a drawing), was identified as a violation of MPQAP, Section 3 design control requirements and is identified as Violation (VIO) 70-3098/2008-03-01: Failure to Incorporate Design Requirements into Field Drawings. This issue was captured in the applicant's corrective action program as CR-2008-254 R1 and NCR EN-08-368.

On September 8-11, 2008, the specialist inspectors reviewed other examples of drawings for change control, QA audits and surveillances, and ECRs, and CRs, to determine if design and document controls were being implemented in accordance with the Quality Assurance program document. Field observations were made of one concrete wall pour and the associated documentation was reviewed. The inspectors

observed some very minor drawing discrepancies but none that could lead to significant errors in construction. The review of QA audits and surveillances, and Engineering Services assessments did not result in any findings of significance.

b. Conclusions

A violation was identified for failure to translate design requirements into field drawings. Other design and document controls were being implemented in accordance with the Quality Assurance program document. Minor drawing discrepancies observed did not lead to significant errors in construction.

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

a. Scope and Observations

The inspectors evaluated the applicant's program to determine compliance with Criterion 7, Control of Purchased Items and Services, and Criterion 8 Identification and Control of Items, of the MPQAP (Rev. 5). The inspectors reviewed and verified that selected elements associated with the applicant's processes, procedures, and programs for controlling purchased material, equipment, and services were in place and implemented. The inspectors evaluated receiving inspection reports of the KWD-TK-3000 Stripped Uranium Reception Tank and the KWD-TK-4000 Low-Level Reception Tank, fabricated by the Joseph Oat Corporation. The inspectors also toured the receiving inspection holding area for the reception tanks. The tanks were fabricated, constructed, tested and delivered in accordance with ASME Boiler and Pressure Vessel Code 1998, Section VIII, Rules for Construction of Pressure Vessels, Division 1.

The inspectors reviewed the following procedures pertaining to QA controls of materials, equipment and services:

- Procurement Specification DCS01-KKJ-DS-SPE-L-1625-3, Procurement Specification for Conventional Tanks
- Project Procedure PP3-28, Quality Control Receiving Inspection, Rev. 1.
- Joseph Oat Corporation Documentation Package for ASME Section VIII, Division 1, Low Level Reception Tank – Equipment No. KWD-TK-4000
- Joseph Oat Corporation Documentation Package for ASME Section VIII, Division 1, Stripped Uranium: Reception Tank – Equipment No. KWD-TK-3000

The inspectors observed that the applicant had initiated and completed the physical receipt inspection of the reception tanks. The inspectors reviewed the list of submittal documents and supporting documentation provided by the vendor to MOX Services. Inspectors reviewed the following submittal documents:

- Core Data Report
- Certificate of Compliance
- Engineering Certificate of Compliance
- Certified Mill Test Report and Certificated of Compliance for Weld Wire
- Hydrostatic and Helium Leak Test Reports
- Non-destructive Examination Reports for ultrasonic examination, penetration testing, and visual testing
- Radiographic Reader Sheets

During review of receiving inspection reports and submittal documents, the inspectors observed that receipt inspections performed to date were performed in accordance with QAPD requirements, approved procedures, and instructions. The inspectors noted that the applicant was still in the process of completing the non-physical receipt inspection of the reception tanks (test reports, core data reports, etc.)

b. Conclusions

The applicant's process for control of materials, equipment and services as evident in the performance of physical receipt inspections of the conventional tanks were controlled in accordance with quality and technical requirements. No findings of significance were identified.

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

a. Scope and Observations

The inspectors evaluated the applicant's program to determine compliance with Sections 15, Nonconforming Materials, Parts or Components, and 16, Corrective Action, of the MPQAP (Rev. 5). The inspectors reviewed three NCRs related to inadequate commercial grade dedication of reinforcing steel bar, embedment piping and steel embedment plates supplied as QL-1 IROFS by a supplier, Energy and Process. MOX Services closed out each of the NCRs to a specific CR which provided the detailed corrective actions to address the issues and complete the resolution. The CRs specified the performance of a 10 CFR Part 21 reportability evaluation and generation of a separate commercial grade item evaluation (CGIE) plan for the reinforcing steel bar installation, the embedment piping and steel embedment plates.

The inspectors reviewed the applicable NCRs, CRs, CGIE plans, 10 CFR Part 21 reportability evaluations, and the following procedures pertaining to the corrective action process and commercial grade dedication:

- PP3-6, Corrective Action, Rev. 10
- PP9-18, Commercial Grade Item Evaluations, Rev. 2

In addition, the inspectors interviewed the cognizant engineering personnel involved in generation of the commercial grade item evaluation plans for the subject items.

b. Conclusions

The applicant had adequately implemented provisions to address identified problems and the required corrective actions. MOX Services project procedures adequately implemented the provisions of the MOX Project Quality Assurance Program (QAP) for nonconforming materials, parts or components and corrective action in addressing inadequate commercial grade dedication of reinforcing steel bar, embedment piping and steel embedment plates. No findings of significance were identified.

8. 10 CFR Part 21, Inspection-Facility Construction (IP 88111)**a. Scope and Observations**

The inspectors evaluated the applicant's program to determine compliance with Section 16, Corrective Action, of the MPQAP (Rev. 5). The inspectors reviewed three 10 CFR Part 21 reportability evaluations generated in response to three CRs addressing inadequate commercial grade dedication of reinforcing steel bars, embedment piping and steel embedment plates. In addition, the inspectors interviewed the licensing personnel involved in the generation of the reportability evaluations. All three reportability evaluations adequately assessed the issues and correctly concluded that the conditions identified were not reportable based on the technical evaluations performed by MOX services. The critical characteristics of the subject items designated as IROFS were determined and verified.

The inspectors also evaluated the applicant's 10 CFR Part 21 program to determine whether the applicant complies with the requirements of 10 CFR Part 21, Reporting Defects and Noncompliance. The inspectors reviewed Inspection Follow-up Item (IFI) 70-3098/2008-01-04, regarding MOX Services vendor, Premier Technology Incorporated (PTI), and PTI's QL-1 supplier, Robatel Industries. Inspectors performed a follow-up of PTI's corrective actions regarding less than adequate control of fabrication activities for the annular tanks, and the process used by PTI to verify the implementation and flow-down of 10 CFR Part 21 to their suppliers. The response to SDR, PTI-08-VS38-01 and the associated corrective actions were reviewed in conjunction with PTI nonconformance report, NCR-08-267, and MOX Services (Vendor Evaluation) Audit Report ROB-08-VE61.

The inspectors reviewed the following documents pertaining to 10 CFR Part 21, Reporting Defects and Noncompliance:

- PP 8-3, Evaluation and Reporting of Defects and Non-Compliance, Rev. 3
- Premier Technology Nonconformance Report 08-267, dated May 06, 2008
- Shaw AREVA MOX Services, Audit Report ROB-08-VE61 Robatel Qualification Audit, dated August 19, 2008
- Supplier Deficiency Report PTI-08-VS38-01, Lack of Control of PTI on it's Suppliers for the Fabrication of the Annular and Slab Tanks, dated April 17, 2008

During the course of this inspection, the response to SDR, PTI-08-VS38-01 was facsimiled to MOX Services. Although the inspectors reviewed the response to the SDR, the applicant had not had the opportunity to evaluate the adequacy of PTI's response nor the corrective actions to the supplier deficiency report. Therefore, Inspection Follow-up Item, IFI 70-3098/2008-01-04, Lack of Control by MOX Services' Vendor PTI, will remain open for subsequent verification of corrective action resolution and completion.

b. Conclusions

The applicant had adequately implemented provisions to address identified problems and required reportability determinations. MOX Services project procedures

adequately implemented the provisions of the MOX Project QAP for corrective action in addressing the reportability of the inadequate commercial grade dedication of reinforcing steel, embed piping, and embed plates. The applicant has taken a proactive approach to resolve supplier quality assurance issues. No findings of significance were identified.

9. Control of the Electronic Management of Data (IP 88113)

a. Scope and Observations

The inspectors evaluated the applicant's program to determine compliance with Section 17, Quality Assurance Records, of the MPQAP (Rev. 5). The inspectors reviewed QA procedures for the management of QA records, and for the administration of the Electronic Document Management System (EDMS). The inspectors toured the Project Records Center (PRC) associated with the MOX project. The inspectors also toured the computer network operating center for the EDMS located in the satellite storage facility. The PRC was established to ensure that QA records were identifiable, retrievable, and protected against damage, deterioration, and loss.

The inspectors reviewed the following procedures pertaining to records management:

- PP 3-4, Records Management, Rev. 6, August 20, 2008
- PP 7-9, Electronic Data Management System, Rev. 2, February 21, 2008
- PP 14-3, Storage for Digital Archive Material, Rev. 1, April 7, 2008

The inspectors observed that the applicant had adequately implemented provisions to control access to the MOX Services PRC. Records not suitable for the EDMS, such as one-of-a-kind records, were permanently stored in the PRC in a two-hour fire rated cabinet. Measures were established to preclude the entry of unauthorized personnel into the storage areas. In addition, the inspectors verified that the applicant had acceptable controls established to control the document life cycle, including: document creation, active use, inactive phase, and final disposition.

Additionally, the inspectors noted the transfer and storage of EDMS back-up tapes was in accordance with PP 14-3. In addition to the monthly back-up tapes, the applicant performed weekly tape back-ups of recent changes to documents stored on the EDMS.

b. Conclusions

The applicant had adequately implemented provisions to control access to the MOX Services records storage facility. MOX Services project procedures adequately implemented the provisions of the MOX Project QAP for QA records management and for the permanent storage of QA records. No findings of significance were identified.

10. Supplier / Vendor Inspection (Construction Phase) (IP 88115)

a. Scope and Observations

The inspectors evaluated the applicant's program to determine compliance with Section 7, Control of Purchased Items and Services, of the MPQAP (Rev. 5). The inspectors reviewed and verified that selected elements associated with the applicant's process, procedures, and programs for controlling purchased material, equipment, and services

were in place and implemented. The inspectors evaluated the supplier evaluations of Consolidated Power Supply performed by MOX Services for the pending supply of QL-1 reinforced structural steel.

The inspectors reviewed the following procedures and documents pertaining to control of materials, equipment and services:

- PP3-12, Supplier Evaluation, Rev. 8
- CPS-08-VE21, Quality Assurance Audit Report
- Purchase Order 10888-P2532 (Consolidated Power Supply)

The inspectors verified that supplier selection was based on an evaluation, performed before the purchase order was awarded, of the supplier's capability to provide items or services in accordance with procurement document (technical and quality) requirements.

b. Conclusions

The applicant had adequately implemented provisions to control materials, equipment and services as evident in the performance of supplier evaluations of a prospective vendor for QL-1 reinforced structural steel. MOX Services project procedures adequately implemented the provisions of the MOX Project QAP. No findings of significance were identified.

11. Inspection of Safety Function Interfaces (IP 88116)

a. Scope and Observations

The inspectors reviewed selected aspects of the integrated safety process, design process and interface controls, procurement process and interface controls, and quality assurance controls as they related to the design and procurement of two purification unit processing tanks (KPA-TK-7000 and KPA-TK-9500). The two processing tanks were designated as QL-1 IROFS. They were also associated with the PSSC pertaining to criticality control.

The inspectors also reviewed project procedure PP 9-20, Safety and Design Integration, Rev. 3, and verified that the Integrated Safety Analysis (ISA) results were incorporated into the design of the annular tanks noted above. Specifically, the inspectors focused on the portion of the ISA that identified the IROFS noted above and verified that the results of the associated Nuclear Criticality Safety Evaluations, DCS01-KPA-DS-ANS-H-350513, dated July 2, 2007, and DCS01-KPA-CG-CAL-H-06973-0, dated May 22, 2007, were incorporated into the design of the tanks.

The inspectors conducted a detailed review of portions of the design process and interface controls documents that MOX FFF had established to meet the requirements of the QAP. Specifically, the inspectors reviewed PP9-1, SSS Quality Levels & Marking Design Documents, Rev. 10, and PP9-3, Design Control, Rev. 14. PP9-1, provided guidance on the identification of quality level and quality level markings pertaining to design documents. PP9-3 discussed the process used to ensure consistency of design with the integrated safety analysis requirements and provided guidance pertaining to the requirement that govern the design control process. The inspectors reviewed two

design calculations samples of the two purification unit processing tanks KPA-TK-7000 and KPA-TK-9500 to assess the applicant's implementation of design control procedures.

In addition, the inspectors reviewed PP9-9, Engineering Specifications, Rev. 8, which provided guidance for revision and control of engineering specifications and also it applied to procurement specification. A sample of procurement specification for the annular tanks was reviewed to evaluate the adequacy of this specific area of the procurement process. The inspectors noted that this document discussed functional and technical requirement from design documents, identified relevant codes, standards and design documents, and determined quality assurance requirements.

Lastly, the inspectors reviewed the applicant's QA controls as they applied to the safety analysis, engineering and design, and procurement of the two QL-1 annular processing tanks. The types of QA controls applied included audits, surveillances, assessments, procedure reviews, document reviews, and design implementation. The inspectors verified that the applicant performed the audits in accordance with PP 3-7, Audits, Rev. 5. Specifically, the inspectors reviewed DCS-07-A06, Structural Design and Nuclear Criticality Safety, dated October 31, 2007, and DCS-08-A02, Engineering Audit, dated June 18, 2008.. DCS-07-A06 focused on the nuclear criticality safety activities as they pertained to AP systems. DCS-08-A02 focused on the review of design to verify that the design met the commitments specified in design basis documents. Both audits reviewed were thorough and identified deficiencies were captured in CRs..

b. Conclusions

The applicant had established a program and procedures for control of safety function interfaces in the areas of integrated safety, design, procurement, and quality assurance controls in accordance with its CAR requirements, and the applicant's QAP.

12. Exit Interview

The inspection scope and results were summarized throughout this reporting period by specialist inspectors, and on September 24, 2008, by the Senior Resident Inspector. No dissenting comments were received from the applicant. Although proprietary documents and processes were 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

J. Adair, Civil - Mechanical Engineering Manager
C. Allen, Engineering Manager
D. Barnett, QA Specialist
F. Blanks, QA Specialist
B. Cliatt, QA Specialist
W. Crisler, QC Manager
W. Elliott, Engineering Vice-President
A. Fadeley, Quality Control
D. Gwyn, Regulatory Affairs Manager
G. Huttleston, Site Tech Representative
D. Ivey, Lead Auditor
R. Justice, Quality Assurance (QA) Programs Engineer
D. Kehoe, QA Engineer
F. Maranda, Construction Procurement Manager
O. Mendiratta, Licensing Engineer
J. Miller, Material Manager
B. Parks, Procurement Engineering Group Manager
T. Sau, Engineer
G. Shell, Quality Assurance Manager
D. Stinson, President and Chief Operating Officer
R. Whitley, Supply Quality Manager
L. Wood, Document Control Manager
S. Youngerman, Technical Services Manager

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

2. **INSPECTION PROCEDURES (IPs) USED**

IP 88107	Quality Assurance: Design and Document Control
IP 88108	Quality Assurance: Control of Materials, Equipment, and Services
IP 88110	Quality Assurance: Problem Identification, Resolution and Corrective Action
IP 88111	10 CFR, Part 21, Inspection-Facility Construction
IP 88113	Control of the Electronic Management of Data
IP 88115	Supplier/Vendor Inspections (Construction Phase)
IP 88116	Inspection of Safety Function Interfaces
IP 88130	Resident Inspection Program for On-Site Construction Activities
IP 88131	Geotechnical/Foundation Activities
IP 88132	Structural Concrete Activities

3. List of Items Opened, Closed, and Discussed

<u>Item Number</u>	<u>Status</u>	<u>Description</u>
2008-003-001	Open	VIO: Failure to Incorporate Design Requirements to Field Drawings
2008-001-04	Open	IFI: Lack of Control by MOX Services' Vendor PTI

4. LIST OF ACRONYMS USED

ACI	American Concrete Institute
ADAMS	Agency-Wide Document Access and Management System
ASME	American Society of Mechanical Engineers
BAP	Aqueous Polishing Building
BMF	Fuel Manufacturing Building
BMP	Manufacturing Building
BSR	Receiving Building
CAR	Construction Authorization Request
CFR	Code of Federal Regulations
CGIE	Commercial Grade Item Evaluation
CLSM	Controlled Low Strength Material
CR	Condition Report
DAR	Deficiency Action Request
E&P	Energy and Process
ECR	Engineering Change Request
EDMS	Electronic Document Management System
IP	Inspection Procedure
IROFS	Item Relied on for Safety
MOX	Mixed Oxide
MFFBS	MOX Fuel Fabrication Building Structure
MOX FFF	MOX Fuel Fabrication Facility
MPQAP	MOX Project Quality Assurance Plan
NCR	Nonconformance Report
NDT	Nondestructive Testing
NMSS	Nuclear Materials Safety and Safeguards
PRC	Project Records Center
psi	Pounds per Square Inch
PSSCs	Principle Structures, Systems, and Components
QA	Quality Assurance
QAP	Quality Assurance Program
QC	Quality Control
QL	Quality Level
QORE	Geotechnical Engineering and Construction Materials Testing Laboratory
Rev.	Revision
SC-1	Seismic Category
SSC	System, Structure, Component
SDR	Supplier Deficiency Report
SR	Surveillance Report
UL	Underwriters' laboratories label
UT	Ultrasonic Examination

5. LIST OF DOCUMENTS REVIEWED

Specifications & Procedures

CP 12-1, Contract Calibration Procedure, Rev. 1
 CP 12-2, Slump Mold Calibration Procedure, Rev. 0
 CP 12-3, Gradation Sieve Verifications, Rev. 1
 CP 12-4, Air Content Meter Calibration, Rev. 1
 CP 12-5, Gradation Sieve Calibration, Rev. 1
 CP 12-6, Thermometer Calibration, Rev. 0
 CP 12-7, Moisture Probes Calibration Procedure, Rev. 2
 CP 12-8, Batch Plant Water Meter Calibration, Rev. 0
 CP 12-9, Mixer Truck Water Meter Sight Glass Calibration, Rev. 1
 CP 12-10, CLSM Flow Cylinder Calibration Procedure, Rev. 0
 PP 3-4, Records Management, Rev. 6
 PP3-5, Control of Non Conforming Items, Rev. 3
 PP 3-6, Corrective Action Process, Rev. 10
 PP 3-7, DCS Project Procedures - Audits, Rev. 5
 PP 3-11, Assessments, Rev. 6
 PP 3-12, Supplier Evaluation, Rev. 8
 PP 3-21, Engineering Change Reports, Rev. 4
 PP 3-26, Surveillance Activities, Rev. 0
 PP 3-28, Quality Control Receiving Inspection, Rev. 1
 PP 7-9, Electronic Data Management System, Rev. 2
 PP 8-3, Evaluation and Reporting of Defects and Non-Compliance, Rev. 3
 PP 9-1, SSC Quality Levels and Marking Design Documents, Rev. 10
 PP 9-3, Design Control, Rev. 15
 PP 9-5, Supplier/Subcontractor Technical Document Control, Rev. 2
 PP 9-6, DCS Project Procedures - Calculations, Rev. 8
 PP 9-7, Drawing, Rev. 11
 PP 9-8, DCS Project Procedures - Technical Documents, Rev. 8
 PP 9-9, Engineering Specifications, Rev. 8
 PP 9-13, Software Development and Acceptance, Rev. 5
 PP 9-18, Commercial Grade Item Evaluations, Rev. 2
 PP 9-20, Safety and Design Integration, Rev. 3
 PP 9-21, Engineering Change Requests, Rev. 4
 PP 10-3, MOX Services Procedures - Procedure Planning, Rev. 1
 PP 10-8, Requisitioning Items and Services, Rev. 5
 PP 10-10, DCS Project Procedures - Procurement Change Management, Rev. 2
 PP 10-13, MOX Services Procedures - Offer/Proposal Evaluation and Award Recommendation, Rev. 2
 PP 10-14, Vendor Submittal Management, Rev. 2
 PP 10-15, Shaw-Areva MOX Services Project Procedures - Supplier/Subcontractor Requests, Rev. 1
 PP 11-25, Control of QL-1 & QL-2 Material, Rev. 0
 PP 11-26, Material Handling, Storage & Control, Rev. 1
 PP 11-28, Reservation, Issue & Return of Material, Rev. 1
 PP 14-3, Storage for Digital Archive Material, Rev. 1
 QI 11-1, Aggregate Gradation Test Procedure, Rev. 5
 QP 3-1, Mix Design, Rev. 1
 QP 3-2, Concrete Mix Validation, Rev. 0

QP 11-1, Test Control, Rev. 2
 QP 12-1, Calibration of Test Equipment, Rev. 1
 QP 13-1, Handling Storage & Shipping, Rev. 0
 WI 9-4, New Mix Design Input or Modification Control, Rev. 5
 WI 9-6, Concrete Delivery Procedure, Rev. 3
 MOX Services Specification, DSC01-BKA-DS-SPE-B-09325-4, Mixing and Delivering for Quality Level QL-1a (IROFS) and QL-2 Concrete, Rev. 4
 MOX Services Specification, DCS01-BKA-DS-SPE-B-09201-2, Concrete Supply, Rev. 2
 MOX Services Specification, DCS-01-KPA-DS-ANS-H-35051-3, Aqueous Polishing Nuclear Criticality Safety Evaluation (NCSE-D) of Purification Unit (KPA) - Quality Level 1a - IROFS, Rev. 3
 MOX Services Specification, DCS-01-KKJ-CG-NTE-L-07657-0, AP Area Annular and Slab Tank Sizing, Rev. 0
 MOX Services Specification, DCS-01-KPA-CG-PLG-L-06742-3, Aqueous Polishing Area Purification Equipment Data Sheet Annular Tank KPA TK7000 Details - Quality Level 1a IROFS, Rev. 3
 MOX Services Specification, DCS-01-KPA-CG-CAL-H-06973-0, Criticality Safety of the Tanks in Cell C-141 of Unit KPA-QL 1a - IROFS, Rev. 7
 MOX Services Specification, DCS-01-AAJ-DS-QAG-Q-65909-2, QA Grading Evaluation for QL 2 Commercial Items, Rev. 1
 MOX Services Specification, DCS-01-LLJ-DS-QAG-Q-65960-0, Quality Assurance Grading Evaluation for Select Laboratory Analyzers and Related Equipment - Quality Level 1 (IROFS), Rev. 1
 MOX Services Specification, DCS-01-KKJ-DS-SPE-L-16264-3, Procurement Specification for Annular Tanks; Quality Level 1a (IROFS), Rev. 0
 DCS-08-A02, Engineering Audit Plan, Rev. 0
 DCS-07-A06, Engineering Audit Plan, Rev. 0

Nonconformance Reports

NCR EN-08-0368, Discrepancy in rebar spacing, 11 versus 9 spacing.

NCR CE-08-0319, Door opening size discrepancy.

NCR EN-08-0434, Discrepancies in rebar size and spacing, initiated September 10, 2008.

QC-08-0266, Embedded Plates was received and installed in the MOX FFF without Commercial Grade Dedication Package by the Supplier making the acceptability of these embedded items as QL-1 material indeterminate

QC-08-0267, Embedded Piping was received and installed in the MOX FFF without Commercial Grade Dedication Package by the Supplier making the acceptability of the piping items as QL-1 material indeterminate

QC-08-0268 Reinforcing Steel was received and installed in the MOX FFF without Commercial Grade Dedication Package by the Supplier making the acceptability of the steel as QL-1 material indeterminate

QC-08-0183, Low Flow Test Measurement

Premier Technology Nonconformance Report 08-268, Rev. 4
 Premier Technology Nonconformance Report 08-267, Rev. 1
 Premier Technology Nonconformance Report 08-297, Rev. 1
 Premier Technology Nonconformance Report 08-299, Rev. 2
 Premier Technology Nonconformance Report 08-286, Rev. 3
 US-08-0213, Controlled Low-Strength Material
 US-08-0234, Concrete Mix/Slump Test
 US-08-0250, Concrete

Corrective Action Program Documents (Condition Reports)

CR 20080254, Revision 1, Discrepancies between design and shop drawings
 CR 20080172, E&Ps subcontractor CMC, has not been performing checks on fabrication detail drawings, August 12, 2008.
 CR 20080295, Inappropriate Signatures.
 CR 20080178, Vendor documents Approved Except as Noted, August 26, 2008.
 CR 20070162, Commercial Grade involving vendor drawings, April 21, 2008.
 CR 20080010, Commercial Grade involving vendor drawings, May 22, 2008.
 CR 20080361, NRC identified that ECR-001054 was not posted against affected documents.
 CR 20080333, Construction Specification 16111 – Embedded Conduit, DCS01-EEJ-DS-SPE-E-25099 – Rev. 2 needs to be revised back to QL-1, Aug. 13 2008.

Purchase Orders (POs)

Solicitation #10888-P2532, Rebar

Procurement Specifications

DCS01-KKJ-DS-SPE-L-1625-3, Procurement Specification for Conventional Tanks

QA Audit Reports and Surveillances

CPS-08-VE21, QA Audit Report of Consolidated Power Supply
 ROB-08-VE61, QA Audit Report of Robatel
 Engineering Management Assessment Report for 2007, dated August 2, 2007
 Activity Assessment Report; Assessment of Implementation of Final Design Confirmation Checklist from PP9-3, Design Control CY08-A-ENG-012, dated July 10, 2008
 QA Audit Report DCS-07-A01, Construction Readiness, May 30, 2007
 QA Audit Report DCS-08-A01, Construction, May 8, 2008
 Surveillance QC -07-0023, E&P Rebar Kickoff at CMC, January 08, 2007
 Surveillance AP-08-VS34, CMC Drawing Process, March 27, 2008
 Surveillance AP-08-VS35, CMC Drawing Process, April 16, 2008
 Surveillance SR-QA-08-111, Case of Vendor Documents noted as Approved except as noted, May 19, 2008
 Surveillance EAP-07-VS15, E&P Vendor Drawings, April 16, 2007
 Surveillance SR-QA-08-0002, Commercial Grade involving vendor drawings, January 7, 2008
 Surveillance SR-QA-08-012, Commercial Grade involving vendor drawings, January 14, 2008

Surveillance SR-QA-08-026, Baker Work Packages, February 04, 2008

Supplier Deficiency Reports

PTI-08-VS38-01

Records and other Documents

Certificate of Conformance, Concrete Production Facilities, MOX Plant #1 and MOX Plant #2, Inspection Date July 17, 2007, Expiration Date July 17, 2009
 Concrete Field Test Report, dated July 17, 2008
 DCS01-BKA-DS-CGD-M-65827-0, Commercial Grade Item Evaluation for Concrete Reinforcements
 DCS01-BKA-DS-CGD-M-65829-0, Commercial Grade Item Evaluation for Steel Plates
 DCS01-UFJ-DS-CGD-T-12017-0, Commercial Grade Item Evaluation for Carbon and Stainless Steel Piping
 MOX Project Quality Assurance Plan, Rev. 5
 Material Certification Report, dated April 10, 2008
 Schedule of Project Mixes, Rev. 13, dated July 30, 2008
 Truck Mixer Uniformity Report/Vendor Review Form, dated July 21, 2008
 Truck Mixer Uniformity Test Calculations, dated July 17, 2008
 Water Flow Meter Calibration Record Form, dated July 17, 2008
 Shop drawing approval routing slip (Traveler) used for CMC Shop Drawing BMP-WR02 dated July 16, 2008, for wall pour W113
 Inspection Plan E225-08-001 Rev. 7 for conduits CCW54050 and CCW54051 dated February 25, 2008
 Inspection Plan E225-07-006 Rev. 2 for safety related conduits CCO34001 through CCO34015 and non-safety related conduits DXN04010 through DXN04012 and CHN14001 through CHN14003, dated 9 Aug 2007 – Work Package #07-10868-C-1069-BMP-SDB-456-C

Drawings

Quality Level 1 – IROFS – Concrete and Reinforcing / Intermediate Elevations 2.3
 CS01 / BMF / DS / PLF / B / 01421, Rev. 3, Sheet 1 of 3, dated January 24, 2008
 Quality Level 1 – IROFS – Concrete and Reinforcing / Intermediate Elevations 4.1
 DCS01 / BMF / DS / PLF / B / 01421, Rev. 3, Sheet 2 of 3, dated January 24, 2008
 Quality Level 1 – IROFS – Concrete and Reinforcing / Intermediate Elevations 5.1, 5.3
 DCS01 / BMF / DS / PLF / B / 01421, Rev. 3, Sheet 3 of 3, dated July 7, 2008
 Quality Level 1a – IROFS – Concrete and Reinforcing / Elevation H DCS01 / BMF / DS / PLF / B / 01393, Rev. 2, Sheet 2 of 3, dated January 8, 2007
 Quality Level 1 – IROFS – Concrete and Reinforcing / Elevation J DCS01 / BMF / DS / PLF / B / 01394, Rev. 3, Sheet 1 of 3
 Quality Level 1 – IROFS – Concrete and Reinforcing / Elevation J DCS01 / BMF / DS / PLF / B / 01394, Rev. 3, Sheet 3 of 3, dated February 4, 2008
 Quality Level 1 – IROFS – Concrete and Reinforcing / Elevation 3 DCS01 / BMF / DS / PLF / B / 01382, Rev. 4, Sheet 3 of 3, dated May 28, 2008
 Quality Level 1 – IROFS – Concrete and Reinforcing / Intermediate Elevations DCS01 / BMF / DS / PLF / B / 01422, Rev. 3, Sheet 1 of 2, dated July 15, 2008
 Quality Level 1 – IROFS – Embedded Plate Locations – Elevation 12 DCS01 / BMF / DS / PLF / B / 01360, Rev. 2, Sheet 1 of 1, dated December 16, 2006

Quality Level 1a – IROFS – Concrete and Reinforcing Plan @ EL. 0' – 0"
DCS01/BMF/DS/PLS/B/11391, Rev. 4, Sheet 1 of 3 dated May 14, 2008

Quality Level 1a – IROFS – Concrete and Reinforcing Plan @ EL. 0' – 0"
DCS01 / BMF / DS / PLF / B / 01361, Rev. 3, Sheet 1 of 1, dated September 26, 2007

Quality Level 1a – IROFS – Concrete and Reinforcing – Plan at Elevation 0'-0"
DCS01 / BMF / DS / PLF / B / 01362, Rev. 3, dated July 10, 2008

Quality Level 1a – IROFS – Concrete and Reinforcing Plan @ EL. 0' – 0" DCS01 / BMF / DS / PLF / B / 01363, Rev. 3, Sheet 1 of 1, dated November 14, 2007

Quality Level 1 – IROFS – BSR Area– Concrete and Reinforcing–Plan @ Elevation 0'-0"
DCS01/BMF/DS/PLF/B/03361, Rev. 3, dated: February 4, 2008

Quality Level 1 – IROFS – Concrete and Reinforcing Elevation 4 DCS01 / BMF / DS / PLF / B / 01383, Rev. 3, Sheet 3 of 3, dated December 18, 2007

Quality Level 1 – IROFS – Concrete and Reinforcing Elevation 5 DCS01 / BMF / DS / PLF / B / 01384, Rev. 3, Sheet 3 of 3, dated December 18, 2007

Quality Level 1 – IROFS – Concrete and Reinforcing Elevation 6 DCS01 / BMF / DS / PLF / B / 01385, Rev. 3, Sheet 3 of 3, dated December 18, 2007

Quality Level 1 – IROFS – Concrete and Reinforcing Elevation T DCS01 / BMF / DS / PLF / B / 01402, Rev. 4, Sheet 1 of 3, dated April 3, 2008

Quality Level 1 – IROFS – Concrete and Reinforcing Elevation T DCS01 / BMF / DS / PLF / B / 01402, Rev. 5, Sheet 2 of 3, dated June 12, 2008

Quality Level 1 – IROFS – Concrete and Reinforcing Elevation V DCS01 / BMF / DS / PLF / B / 01403, Rev. 4, Sheet 1 of 3, dated May 28, 2008

Quality Level 1 – IROFS – Concrete and Reinforcing Elevation V DCS01 / BMF / DS / PLF / B / 01403, Rev. 6, Sheet 2 of 3, dated April 30, 2008

Quality Level 1 – IROFS – Concrete and Reinforcing Intermediate Elevation 5.3 DCS01 / BMF / DS / PLF / B / 01423, Rev. 4, Sheet 2 of 3, dated May 6, 2008

Quality Level 1a – IROFS – Concrete and Reinforcing Intermediate Elevation S.1, T.2, V.2, V.1 DCS01 / BMF / DS / PLF / B / 01424, Rev. 3, Sheet 2 of 2, dated April 30, 2008

DCS01 / BMF / DS / PLF / B / 01391 , Rev. 3 Sheet 2 of 3 dated 16 Nov. 07 DCS01 / BMF / DS / PLF / B / 01391, Rev. 2, Sheet 1 of 3, dated November 10, 2007

CMC Rebar Carolinas–Job No. SC-70123, Drawing No. BMP–WR09, dated October 8, 2007

CMC Rebar Carolinas–Job No. SC-70123, Drawing No. BMP–WR15, dated October 8, 2007

CMC Rebar Carolinas–Job No. SC-70123, Drawing No. BMP–WR18, dated November 11, 2007

CMC Rebar Carolinas–Job No. SC-70123, Drawing No. BMP–WR20, dated November 28, 2007

CMC Rebar Carolinas–Job No. SC-70123, Drawing No. BMP–WR21, dated December 3, 2007

CMC Rebar Carolinas–Job No. SC-70123, Drawing No. BMP–WR02, dated July 16, 2008

CMC Rebar Carolinas–Job No. SC-60258, Drawing No. BMP-RF113, dated March 6, 2007

CMC Rebar Carolinas–Job No. SC-60258, Drawing No. BSR-RF05, dated August 18, 2008

Specifications

16111 Embedded Conduit QL-4 – DCS01-EEJ-DS-SPE-E-25099, Rev. 2, dated August 27, 2007.

Work Packages

07-10888-C-1935-BMP-W112-C for wall W112
 07-10888-C-1609-BMP-F111A-EC for System - F111A-EC Electrical Conduits
 07-10888-C-1609-BSR-W3-E for System – Embedded Electrical Conduit
 08-10888-C-1609-BAP-W6-C

Engineering Change Requests

ECR 000866, Add dowels in ECR 000353 to shop drawing
 ECR 000865, Add dowels to entire wall.
 ECR 000815, Cut and add rebar in pour fill to correct door opening size.
 ECR 000353, Secondary poured walls at the North and South ends of room B-123.
 ECR 000378, Rev. 3 CRT Shielded Panels – Add Embeds and Through Room B194
 ECR 000386, Rev. 0 Vault shift South Room 158 (DCM)
 ECR 000637, Rev. 0 Update Structural Drawings to match current design (DCM) in association with ECR-000386.
 ECR 000399, Rev. 1 Add Wall Penetration Room B-157 to B-158
 ECR 000404, Rev. 0 DDP Process–Door design required between Rooms B275 – B276.
 ECR 000449, Rev. 2 DCM vault requires steel angle support on ledge corner.
 ECR 000528, Rev. 0 Provide embeds for Norshield Type Security Doors in BMP.
 ECR 000578, Rev. 0 TAS Rod Assembly Cooling mounting interferences in Room B183.
 ECR 000599, Rev. 0 Embed plates for PML-C2 in Rooms B117, B121, B136, and B137.
 ECR 000639, Rev. 0 Replace ABC wall with concrete wall in airlock B198 and B120.
 ECR 000645, Rev. 0 Remove Mezzanine stub walls from Room B152.
 ECR 000906, Rev. 0 Revise concrete slab thickness to 18” from 20” at BMP Floor Plan @ El. 0'-0” located between column lines 10 and 12 and G to H to eliminate piping interference.
 ECR 001063, Rev. 0 Dowels required for attaching the topping slab to the main basemat not identified in the shop drawings to be included with Pour BMP-F122.
 ECR 000339, Rev. 0 Embedded Conduit Separation Criteria: Change specification DCS01-EEJ-DS-SPE-E-25099-1, Section 3.1.D to maintain a minimum of 3 inches clear separation between parallel runs.
 ECR 000173, Revisions to the Tank Procurement Specifications for Latest Version of the Code, Rev. 0
 ECR 000254, Revisions to Slab and Annular Tank Specifications, Rev. 0
 ECR 000881, Procurement Specification for Annular Tanks Requires Updating, Rev. 0