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

April 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 FUEL FABRICATION FACILITY- NRC INSPECTION REPORT 70-3098/2008-001 AND NOTICE OF VIOLATION

Dear Mr. Stinson:

During the period of January 1 thru March 31, 2008, the US Nuclear Regulatory Commission (NRC) completed inspections of construction activities related to the construction of the proposed Mixed Oxide Fuel Fabrication Facility (MFFF). The purpose of the inspections was to determine whether activities authorized by the construction authorization were conducted safely and in accordance with NRC requirements. The enclosed inspection report documents the inspection results. At the conclusion of the inspections, the findings were discussed with those members of your staff identified in the enclosed report.

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

Based on the results of this inspection, the NRC has determined that violations of NRC requirements occurred. The violations were evaluated in accordance with the NRC Enforcement Policy. The current Enforcement Policy is available on the NRC's Web site at www.nrc.gov/about-nrc/regulatory/enforcement/enforce-pol.html. The violations are cited in the enclosed Notice of Violation (Notice) and are being cited in the Notice because they were identified by the NRC. The circumstances surrounding them are described in detail in the subject inspection report.

You are required to respond to this letter and should follow the instructions specified in the enclosed Notice when preparing your response. For your consideration, NRC Information Notice 96-28, "SUGGESTED GUIDANCE RELATING TO DEVELOPMENT AND IMPLEMENTATION OF CORRECTIVE ACTION," is available on the NRC's Web site. The NRC will use your response, in part, to determine whether further enforcement action is necessary to ensure compliance with regulatory requirements.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosures, and 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, your response should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the Public without redaction.

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

Sincerely,

/RA by Cynthia D. Taylor acting for/

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 70-3098/2008-001 w/attachment

cc w/encl: (See page 3)

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ADAMS: ☐ Yes ACCESSION NUMBER: ML081210717

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SIGNATURE	WBG	Via Email	KFO	Via Email	CDT for	Via Email	
NAME	WGloersen	MShannon	KO'Donohue	JTapia	RJackson	PBell	
DATE	4/29/2008	4/28/2008	4/30/2008	4/28/2008	4/30/2008	4/28/2008	
E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	

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cc w/encl:
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Letter to D. Stinson from Deborah A. Seymour dated April 30, 2008

SUBJECT: MIXED OXIDE FUEL FABRICATION FACILITY – NRC INSPECTION REPORT 70-3098/2008-001 AND NOTICE OF VIOLATION

Distribution w/encl:
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D. Tiktinsky, NMSS
D. Jackson, NMSS
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D. Seymour, RII
M. Lesser, RII
K. O'Donohue, RII
M. Shannon, RII
W. Gloersen, RII
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 January 1 through March 31, 2008, two violations of NRC requirements were identified. In accordance with the NRC Enforcement Policy, the violations are listed below:

A. Condition 3.A of NRC Construction Authorization No. CAMOX-001 (Revision 1, dated November 30, 2006) authorizes, in part, the certificate holder to construct a plutonium processing and mixed oxide fuel fabrication plant, known as the Mixed Oxide Fuel Fabrication Facility (MFFF) located at the Department of Energy's Savannah River Site, in accordance with the statements, representations, and conditions of the Construction Authorization Request (CAR) dated October 30, 2002 (as revised in supplements dated December 12, 2002; February 18, 2003; April 1, 2003; April 8, 2003; July 28, 2003; June 10, 2004; January 27, 2005, and February 9, 2005).

   Condition 3.C of the construction authorization authorizes MOX Services to construct the facility in accordance with the design bases of the primary systems, structures, and components (PSSCs) described in the CAR, and environmental protection commitments set forth in MOX Services' Environmental Report and revisions thereto.

   MFFF CAR Section 11.1.7.3 specifies the codes and standards applied to the MFFF for Seismic Category 1 (SC-I) structures and includes American Concrete Institute (ACI) 349-97, Code Requirements for Nuclear Safety-Related Concrete Structures and Commentary.

   ACI 349-97, Chapter 7, Details of Reinforcement, Section 7.2, Minimum Bend Diameters, requires that the diameter of bend measured on the inside of the bar, shall not be less than the values in Table 7.2. Table 7.2, Minimum Diameters of Bend, requires that the minimum diameter for a number 11 reinforcing bar be eight times the nominal diameter of the bar. The nominal diameter for a number 11 bar is 1.41 inches; therefore the required minimum bend diameter for a number 11 bar is 11.28 inches.

   Contrary to the above, the certificate holder failed to ensure that numerous pieces of reinforcing steel bars met the minimum bend diameter specified in ACI 349-97. Between February 4 and 7, 2008, the NRC inspectors identified numerous reinforcing bars (both released for construction and installed) with minimum bend diameters less than 11.28 inches in staging areas northwest and southwest of the MOX Aqueous-Polishing Building (BAP) and in installed Concrete Placement BAP-F5B-C.

   This is a Severity Level IV violation (Supplement II)

B. Condition 3.A of NRC Construction Authorization No. CAMOX-001 (Revision 1, dated November 30, 2006) authorizes, in part, the certificate holder to construct a plutonium processing and mixed oxide fuel fabrication plant, known as the Mixed Oxide Fuel Fabrication Facility (MFFF) 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 28, 2007 (Revision 5). Section 16 of the

MPQAP, Corrective Action, requires in part, that appropriate corrective actions shall be taken for conditions adverse to quality.

Contrary to the above, on October 23, 2007, the certificate holder failed to take appropriate corrective actions for conditions adverse to quality. The certificate holder failed to provide adequate resolution to justify the use of non conforming number 11 reinforcing steel splices that did not meet design or ACI code requirements, in that Non-Conformance Report (NCR) EN-07-0110 was closed on October 23, 2007, accepting the non-conforming condition of the splices and to use as is, without providing adequate justification for the closure.

This is a Severity Level IV violation (Supplement II)

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

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

Because your response will be made available electronically for public inspection in the NRC Public Document Room (PDR), or from the NRC's document system (ADAMS), which is accessible from the NRC web site at http://www.nrc.fob/reading-rm/adams.html, to the extent possible, it should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the public without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request withholding of such material, you must specifically identify the portions of your response that you seek to have withheld, and provide in detail the bases for your claim of withholding (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information). If safeguards information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21.

In accordance with 10 CRR 19.11, you may be required to post this Notice within two working days. Dated at Atlanta, Georgia this 30th day of April 2008.

U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.:	70-3098
Construction Authorization No.:	CAMOX-001
Report No.:	70-3098/2008-001
Certificate Holder:	Shaw AREVA MOX Services
Location:	Savannah River Site Aiken, South Carolina
Inspection Dates:	January 1 – March 31, 2008
Inspectors:	M. Shannon, Senior Resident Inspector, Construction Projects Branch 1 (CPB1), Division of Construction Projects (DCP), Region II (RII), MOX FFF W. Gloersen, Senior Project Inspector, CPB1, DCP, RII J. Tapia, P.E., Senior Reactor Inspector Senior Construction Inspector, Construction Inspection Branch 2 (CIB2), Division of Construction Inspection (DCI), RII
Accompanying Personnel:	R. Jackson, Construction Inspector Trainee, CIB2, DCI, RII P. Bell, Senior Quality Assurance Engineer, NMSS
Approved:	Deborah A. Seymour, Chief Construction Projects Branch 1 Division of Construction Projects

EXECUTIVE SUMMARY

Shaw AREVA MOX Services
Mixed Oxide Fuel Fabrication Facility
NRC Inspection Report No. 70-3098/2008-001

These routine inspections included activities conducted by specialists from the Region II and Nuclear Material Safety and Safeguards offices during January 3-4, February 4-8, and March 11-12, 2008, and the senior resident inspector from January 1 through March 31, 2008, and involved the observation and evaluation of the certificate holder's programs for facility construction of principle structures, systems, and components (PSSCs) which included; quality assurance (QA) related to problem identification, resolution, and corrective actions; inspection, test control, and control of measuring and test equipment; structural concrete activities; and geotechnical foundation activities. The inspections identified the following aspects of the certificate holder's programs as outlined below:

Resident Inspection Program for On-Site Construction Activities

- Construction activities related to principle structures, systems, and components (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 (NDT); receipt of materials; and concrete placements. The construction activities were performed in a safe and quality related manner and in accordance with procedures and work packages (Section 2).

Quality Assurance: Inspection, Test Control, and Control of Measuring and Test Equipment (Pre-Licensing and Construction)

- Equipment and instruments used to perform concrete specimen strength testing were properly calibrated. Concrete specimens were properly prepared and stored under proper temperature and humidity conditions at the geotechnical engineering and construction materials testing laboratory (Section 3.(a)).

- The concrete plant chemical addition system was properly calibrated (Section 3 (b)).

Geotechnical/Foundation Activities

- The use of concrete-low strength mix, (CLSM) did not adversely affect the design of the structure based on a worse case analysis. However, the certificate holder's analysis did not consider the final as-built condition of the structure nor the effect on exterior walls. Additional analyses were planned, including the adequacy of CLSM under foundations (in yet to be built in areas) that were currently excavated, and the impact of CLSM on the lateral soil-structure interaction (Section 4).

- The placement and testing activities observed were controlled in accordance with technical and quality requirements. The use of CLSM was an effective method for backfilling the areas around and under the MOX facility. No issues of significance were identified (Section 4).

Quality Assurance: Problem identification, Resolution and Corrective Action

- The disposition of a non-conformance report (NCR) related to concrete cracks lacked detail to support the technical conclusion. The QA surveillance program was actively identifying inadequate NCR dispositions and corrective action is planned to address this issue. A proper engineering review and disposition process was implemented for available engineering change requests. No issues of concern were identified (Section 5.(a)).

- A violation was identified for the failure to provide adequate disposition of non-conforming reinforcing steel splices (Section 5.(b)).

Structural Concrete Activities

- Piping and plates were properly installed, cleanliness was more than adequate, and concrete placement activities were appropriate. No items of concern were identified (Section 6.(a)).

- The control of concrete quality as measured by the standard deviation and assessed according to American Concrete Institute (ACI) rating criteria was classified as excellent. The specified design strength requirement was satisfied. No items of concern were identified (Section 6.(b)).

- The results of the investigation into the failure of the reinforcing bar did not disclose any failure to meet material specification requirements or unexpected chemical or material defects. The failure of the bar resulted from excessive impact loading of a work hardened section. The use of sledge hammers to relocate reinforcing bars has been discontinued by the certificate holder. No items of concern were identified (Section 6.(c)).

- The failure to meet ACI Code requirements for reinforcing bar minimum bend radius was identified as a violation of Construction Authorization Request (CAR) Section 11.1.7.3 requirements (Section 6 (c)).

Supplier/Vendor Inspection (Construction Phase)

- Implementation of the QA program pertaining to the certificate holder's conduct of vendor audit activities for the Georgia Tech Computer Aided Structural Engineering Center was adequate. The certificate holder attained planned audit objectives and had clearly communicated the identified deficiencies to the vendor. The certificate holder's audit culminated in the identification of two findings and three observations. The two findings of noteworthy significance identified programmatic deficiencies regarding less than adequate timeliness of completion of an annual audit and a less than adequate program for trend analysis of software error reports (Section 7 (a)).
- Effective implementation of the vendor's quality processes to meet applicable codes, standards and regulatory requirements was noted, with the exception of the lack of maintaining certain controls on subcontractors for the fabrication of annular and slab tanks. Premier Technology had developed and implemented an adequate program to evaluate and correct conditions adverse to quality (Section 7 (b)).

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 certificate holder continued construction activities of principle structures, systems, and components (PSSCs) related to building construction up to ground level (Release 1). The certificate holder completed seven additional base mats (now at 14 of 28) needed to bring building construction up to ground level. The certificate holder also started Release 2 activities and two walls of the fuel manufacturing building (BMF) have been completed. At the end of the inspection period, the certificate holder had placed approximately 18,000 cubic yards of concrete, finished the lower level base mats for the receiving building, finished the base mats of the aqueous polishing building, completed six of 16 base mats in the manufacturing building, and placed approximately 17,000 cubic yards of flowable concrete in place of engineered fill.

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 Mixed Oxide (MOX) fabrication building, aqueous polishing building, and receiving building; (2) installation of embedded piping and embedded support plates in all three buildings; (3) placements of concrete in basemats for the BMF, aqueous polishing building, and receiving building; (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) and concrete testing in the lab (strength); (7) welding and non-destructive testing (NDT) of piping to be embedded; (8) installation of building grounding cables in various basemats 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 basemats and walls. No items of concern were identified.

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 certificate holder's procedures. No items of concern were identified.

The inspectors reviewed the applicable sections of the certificate holder'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 the program. Specifically, the inspectors verified that installations were in accordance with applicable design drawings and met the general construction notes detailed on the drawings: (1) MOX Fuel Fabrication Facility, Concrete and Reinforcing General Notes, DCS01-01352, Revision 9 (Sheet 1 of 2); and

(2) MOX Fuel Fabrication Facility, Concrete and Reinforcing General Notes and Tolerance Details, DCS-01352, Revision 6 (Sheet 2 of 2). No items of concern were identified.

The inspectors routinely attended the certificate holder'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 and 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 work packages maintained at each work site to verify construction personnel obtained proper authorizations to start work and maintained the packages up to date as tasks were completed. No items of concern were identified.

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 carried out 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 exceptional 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 as they were generated. The review included non-conformance reports (NCRs), condition reports (CRs), root causes and supplier deficiency reports (SDRs). The inspectors also reviewed the closure of all NCRs and selected CRs. The inspector concluded that the certificate holder was appropriately identifying conditions adverse to quality in their corrective action systems. These items were identified during routine daily activities, special inspections, audits, and self assessments. The certificate holder 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 certificate holder entered issues into the corrective action system identified during self assessments.

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 (NDT); receipt of materials; and concrete placements. The construction activities were performed in a safe and quality related manner and in accordance with procedures and work packages.

3. Inspection, Test Control, and Control of Measuring and Test Equipment (IP 88109)

a. Concrete Testing Lab

(1). Scope and Observations

As part of the evaluation to assess the certificate holder's test control and control of measuring and test equipment, the inspectors observed slump testing, air entrainment testing, and monitoring of concrete temperature as various concrete placements occurred. The testing was performed by a geotechnical engineering and construction materials testing laboratory (QORE) personnel and observed by MOX Services Quality Control (QC) personnel. No items of concern were identified.

The inspectors observed QORE personnel preparing concrete specimens. The specimens were prepared and stored in accordance with the American Society for Testing and Materials (ASTM) C 31, Standard Practice for Making and Curing Concrete Test Specimens in the Field. No items of concern were identified.

The inspectors inspected the concrete specimen curing room located at the QORE test facility on January 17. The inspectors noted that the temperature was maintained at 73 degrees Fahrenheit (F) and that the specimens were properly sprayed with water as part of the curing process. The inspectors noted that the additional specimens generated from the flow-able fill concrete being used in place of engineered fill was resulting in the curing room approaching maximum specimen capacity. Discussions with QORE personnel indicated that the QORE test lab facility, including the curing room, would be relocated to a larger facility during May 2008. No items of concern were identified.

The inspectors verified that the testing equipment was calibrated, and observed proper calibration stickers on equipment used to strength test concrete specimens at the QORE test facility. The inspectors witnessed concrete strength testing during February 4-8, 2008. The inspectors also verified that the curing room for the concrete samples met the requirements of the American Concrete Institute (ACI) for temperature and humidity. The testing was performed in accordance with ASTM C 39, Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens. The inspectors also routinely reviewed the Concrete Statistical Summary maintained by US Concrete for MOX concrete testing. This summary included all testing to date.

(2). Conclusions

Equipment and instruments used to perform concrete specimen strength testing were properly calibrated. Concrete specimens were properly prepared and stored under proper temperature and humidity conditions at the QORE testing laboratory.

b. Concrete Production Plant

(1). Scope and Observations

The inspectors observed appropriate and current calibration stickers on the concrete chemical addition systems. In addition, the inspectors inspected the on-site concrete

production facility. The inspectors reviewed the concrete supplier's National Ready Made Concrete Association (NRMCA) QC manual plant certification for truck numbers 101, 102, 103. 104, and 105, and determined that the documentation was in order. No items of concern were identified.

(2). Conclusions

The concrete plant chemical addition system was properly calibrated.

4. Geotechnical/Foundation Activities (IP 88131)

a. Scope and Observations

The inspection focused on the certificate holder's use of Controlled Low Strength Material (CLSM) in lieu of compacted engineered fill.

During the inspection period, the inspectors observed various placements of CLSM. Approximately 10,000 yards of CLSM was placed during this inspection period. The inspectors noted that following substantial rainfall, affected CLSM was removed prior to addition of the remaining CLSM. The inspectors verified proper preparation of embankments prior to addition of CLSM. The inspectors verified CLSM strength test results and noted that the CLSM material strength remained within specification limits. Discussions with survey crews indicated that there was no settlement problems.

The inspectors reviewed analysis report DCS01-XGA-DS-CAL-B-01101-0, Study for Using CLSM Locally and Analysis Update of BMF Structure, dated December 12, 2007. The analysis was a finite element calculation to determine the effect of using CLSM in a localized area under the foundation mat of the MOX Fuel Building (BMF) structure instead of engineering fill as originally specified. The calculation was a postulated local worse-case condition and did not include the final as-built condition defined by the total use of CLSM in other areas in the future. The defined worse case condition was a 20 by 80 foot segment of foundation along the outside edge of the building. Results showed a reduction of 6% in the existing design margin of 17%. The inspectors also noted that the calculation only addressed the foundation and did not include a lateral analysis which considered the use of CLSM adjacent to exterior walls. Although the exterior walls are stiff due to their thickness, the effect, if any, on the rest of the structure should be reviewed. The certificate holder representatives informed the US Nuclear Regulatory Commission (NRC) inspectors that the current analysis would be revised to assess both the final as-built condition, once defined, and the lateral effect of the CLSM. Since additional analyses are planned by the certificate holder to include these items, Inspection Follow-up Item (IFI) 70-3103/2008-01-01, Review of Final CLSM Analysis, is identified for this issue. The IFI will address the adequacy of CLSM under foundations (yet to be built) in areas that are currently excavated and the impact of CLSM on the lateral soil-structure interaction.

The inspection also included direct observation of a 500 cubic yard placement of CLSM along the north side of the Aqueous Polishing Building (BAP). Both placement and testing activities were observed. Technical requirements were specified in Engineering Change Request (ECR) 000430, Revision 7 and the work instructions were delineated in Work Package 08-10888-C-1609-ENG-FILL, dated February 2, 2008. Both documents

were reviewed by the inspectors to determine the adequacy of technical and quality requirements.

b. Conclusions

The use of CLSM did not adversely affect the design of the structure based on a worse case analysis. However, the analysis did not consider the final as-built condition of the structure nor the effect on exterior walls. Consequently, an IFI was identified for this issue.

The placement and testing activities observed were controlled in accordance with technical and quality requirements. The use of CLSM was an effective method for backfilling the areas around and under the MOX facility. No issues of significance were identified.

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

a. Resolution of Concrete Cracking

(1). Scope and Observations

The inspectors reviewed a NCR related to the identification of cracks in the finished surface of concrete in placements BSR-F1A and BSR-F1B. While the technical evaluation of the cracks was based on an unexpected low ambient temperature coupled with a large cross-section which resulted in a very large temperature gradient, the documentation of the NCR disposition did not contain adequate detail. It was necessary for the NRC inspectors to interview cognizant personnel to obtain all pertinent facts supporting the technical disposition. Subsequent discussion with the certificate holder disclosed that a recent QA surveillance of NCRs identified several dispositions that did not have adequate technical justification and lacked detail. The QA surveillance program was actively identifying inadequate NCR dispositions. A CR was generated to address this issue and implement corrective action. The inspectors evaluated available engineered change requests (ECRs) and concluded that the proper engineering review and disposition process was implemented.

(2). Conclusions

The disposition of a NCR related to concrete cracks lacked detail to support the technical conclusion. The QA surveillance program was actively identifying inadequate NCR dispositions and corrective action is planned to address this issue. A proper engineering review and disposition process was implemented for available ECRs. No issues of concern were identified.

b. Resolution of Insufficient Basemat Reinforcing Steel Overlap

(1). Scope and Observations

The inspectors reviewed NCR EN-07-110 related to the identification that for basemat BMP-105, a few bottom basemat number 11 reinforcing steel splices did not meet the minimum overlap splice of 7 foot (ft.) 3 inches minus 1 inch for allowed tolerance

(7 ft. 2 inch design minimum). On October 23, 2007, the NCR had been improperly closed in that insufficient information had been provided to justify closure. The inspectors noted that MOX Services field engineering failed to accurately document the as found condition of the reinforcing steel splices and subsequently had to estimate the number and location of the improper splices. This issue was brought to MOX Services management's attention and another NCR, EN-08-178, was initiated to resolve the issue. This NCR was closed on January 28, 2008, by stating that the bars were nearly within tolerance, the full tension capacity of the lap was minimally reduced, and a redistribution of stresses would be highly likely throughout the slab. MOX Services failed to provide actual design calculations to justify the out-of-tolerance splices.

MOX Services design drawing, BMF-01352, states the following: (1) "The complexity of the BMF reinforcing dictates strict adherence to the fabrication tolerances in ACI 117-90;" and (2) "Lap splice lengths of reinforcing steel shall be as shown in the schedules of reinforcing development length and lap splice length." The Schedule of Reinforcing Development Length and Lap Splice Length Walls and Slabs list the minimum lap splice for number 11 rebar as "7 ft. 3 inches." ACI-90, Standard Specifications for Tolerances for Concrete Construction and Materials, Section 2.2.8, allows a tolerance of -1 inch for number 11 rebar. The failure to adequately disposition the non-conforming condition was considered to be a violation of the requirements of the MOX Project Quality Assurance Plan (MPQAP), Section 16, Corrective Action, and is identified as Violation (VIO) 70-3098/2008-01-02: Inadequate Disposition of Non-Conforming Reinforcing Steel Splices. At the end of the inspection period MOX Services had not adequately resolved this issue.

(2). Conclusions

A violation was identified for the failure to adequately disposition non-conforming reinforcing steel bar splices.

6. Structural Concrete Activities (IP 88132)

a. Concrete Placement Activities

(1). Scope and Observations

The inspectors evaluated the adequacy of the ongoing Quality Level (QL) -1 concrete placement activities which are considered to be items relied on for safety (IROFS). The inspection focused on reinforcing steel installation, pre-placement preparation, materials testing, and placement procedures utilized.

Construction Specifications DCS01-BKA-DS-SPE-B-09325-4, Section 03051 - Mixing and Delivering For Quality Level QL-1a (IROFS) and QL-2 Concrete, and DCS01-BKA-DS-SPE-B-09330-3, Section 03301 - Placing Concrete and Reinforcing Steel for Quality Level 1a, 2, 3, and 4, were reviewed to determine the adequacy of technical and quality requirements for concrete placement activities. The implementation of these requirements was controlled by Baker Concrete Construction, Inc., Project Procedure 110, Procedure for Concrete Placement, Revision 5, which was also reviewed by the inspectors.

During the inspection period, the inspectors observed various concrete placements. Prior to the placements, the inspectors reviewed the concrete and reinforcing steel drawings for the scheduled work, and randomly inspected the formwork and reinforcing steel to verify that ACI Code requirements were satisfied. Inspectors observed two concrete placements, one in the BAP and one in the Shipping/Receiving Building (BSR). The work and testing activities related to these placements were observed and evaluated for adequacy of implementation. The specific implementing requirements for the BSR placement were contained in Work Package 07-10888-C-1609-BSR-W3-C, dated February 5, 2008, and in Work Package 07-10888-C-1609-BAP-F5B-C, dated February 7, 2008, for the BAP placement.

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 certificate holder's QA and QC staff was observed conducting testing and surveillance of concrete activities as required by the QA program.

The inspectors observed various activities prior 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 support. 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 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 Quality Control inspections and corrected by the certificate holder. 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 observed concrete placement activities:

- January 9, 2008, BMP F-104, BMP Basemat, 1140 cubic yards, verified by drawings BMP-RF104, BMP-RF104A, BMP-RF104B, and BMF-01776.

- January 15, 2008, BSR W-4, BSR Wall, 100 cubic yards, verified by drawings BSR-WR02, and revised BSR-WR02, and BMF-01778.

- January 16, 2008, BAP F-4, BAP Basemat, 940 cubic yards, verified by drawings BAP-FR01, BAP-FR02, BAP-FR03, and BMF-01774.

- January 22, 2008, BMP F106, BMP Basemat, 1340 cubic yards, verified by drawings BMP-RF104, BMP-RF104A, BMP-RF104B, and BMF-01776.

- January 29, 2008, BMP F-108, BMP Basemat, 960 cubic yards, verified by drawings BMP-RF104, BMP-104A, BMP-RF104B, and BMF-01776.

- February 7, 2008, BAP-F5, BAP Basemat, 910 cubic yards, verified by drawings BAP-FR01, BAP-FR02, BAP-FR03, and BMF-01774.

- February 28, 2008, BMP F-102A, BAP Elevator Basemat, 50 cubic yards

- March 5, 2008, BMP-W101, BMP 23 ft interior wall, 260 cubic yards, verified by drawing BMP-WR01.

- March 6, 2008, BAP-F6, BAP Basemat, 1250 cubic yards, verified by drawings BAP-FR01, BAP-FR02, BAP-FR03 and BMF-01774.

- March 18, 2008, BMP W102, BMP 23 ft interior wall, 215 cubic yards, verified by drawings BMP-WR02

- March 20, 2008, BMP F-107, BMP Basemat, 1400 cubic yards, verified by drawings BMP-RF103, BMP-RF103A, BMP-RF103B, and BMF-01776

- March 26, 2008, BAP-W1, BAP wall 1 first lift, 225 cubic yards, verified by drawings BAP-WR01. Placement not observed by SRI/NRC.

No items of concern were identified.

(2). Conclusions

Piping and plates were properly installed, cleanliness was more than adequate, and concrete placement activities were appropriate. No issues of significance were identified.

b. Concrete Testing

(1). Scope and Observations

Concrete cylinder compression test results for the most recent 28-day old concrete placement were reviewed by the inspectors. 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 pounds per square inch (psi) based on the 56-day compressive strength.

The analysis of concrete strength variation over time, conducted in accordance with ACI Report 214R, Evaluation of Strength Test Results of Concrete, was also reviewed. The review, performed by US Concrete, noted a variation in the production of the cement which accounted for the observed variation in the seven day and 28-day strength test results.

(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 satisfied. No issues of significance were identified.

c. Reinforcing Steel

(1). Scope and Observations

The failure of a number 11 reinforcing steel bar that occurred on January 30 as a result of impact with a sledge hammer during location adjustment of the reinforcing steel was reviewed by the NRC inspectors. The failure occurred in the bend area of a horizontal reinforcing bar with a 90 degree section intended for development of the design strength of the bar. The certificate holder developed a project plan of action to investigate the failure of the bar. The plan included: (a) a bend test of a straight section of the failed bar, two bend tests on bars from the same heat number and two bend tests on bars from alternative heat numbers; (b) visual and liquid penetrant tests in the bend areas of the tested bars; (c) chemical and mechanical analysis on all five samples from the bend tests; (d) microstructure examination of the tested samples; and (e) review of all Certified Mill Test Reports of all heats received on site.

The inspectors reviewed the results of all elements of the plan and witnessed the performance of visual and penetrant testing.

During inspection of reinforcing bars in staging areas, installed in formwork, and partially embedded in concrete, the inspectors identified numerous number 11 bars that appeared to be sharply bent. Because cold bending of reinforcing steel causes work hardening and may reduce ductility, limits on minimum radius are prescribed by the ACI Code. Additionally, because the reinforcing bars are manufactured from relatively high strength steel (60,000 psi yield strength), and because the deformations on the bar surface act as stress concentrators, reinforcing bars may fracture on bending if the radius of bend is too tight.

Mixed Oxide Fuel Fabrication Facility (MFFF) Construction Authorization Request (CAR) Section 11.1.7.3 specifies the codes and standards applied to the MFFF for Seismic Category 1 (SC-I) structures including ACI 349-97, Code Requirements for Nuclear Safety-Related Concrete Structures and Commentary. ACI 349-97, Code Requirements for Nuclear Safety-Related Concrete Structures & Commentary, Chapter 7, Details of Reinforcement, Section 7.2, Minimum bend diameters, requires that the diameter of bend measured on the inside of the bar, shall not be less than the values in Table 7.2. Table 7.2, Minimum diameters of bend, requires that the minimum diameter for a number 11 reinforcing bar be eight times the nominal diameter of the bar. The nominal diameter for a number 11 reinforcing bar is 1.41 inches; therefore the required minimum

bend diameter is 11.28 inches. Subsequent measurement of actual bend diameters of bars in lay down areas northwest and southwest of the MOX BAP and in installed Concrete Placement BAP-F5B-C, identified numerous bars with bend diameters less than 11.28 inches. The failure to meet ACI Code 349-97 requirements for reinforcing bar minimum bend radius is identified as a violation of CAR Section 11.1.7.3 (VIO 70-3098/2008-01-03: Failure to Meet ACI Code Requirements).

In response to the inspector's finding, MOX Services issued NCR QC-08-0203 on February 6, 2008. The initial actions taken by MOX Services included rejecting the defective bars that had not been installed, adding additional bars in areas needed, and evaluating, by calculation, the impact of the defect on installed concrete placements. The following reports were reviewed by the inspectors:

a. Technical Justification of Rebar Bend Diameter Inadequacy in Existing Concrete of BMF Structure, February 26, 2008

b. Technical Report on Reinforcing Bar Failing Minimum Bend Radius Requirements, February 26, 2008

The reports documented a thorough extent of condition review and a basis for acceptability of the installed reinforcing steel. The assessment of potential impact was addressed by performing an ANSYS stress analysis with the worse case condition defined. The inspectors and Nuclear Materials Safety and Safeguards (NMSS) staff reviewed the analysis and determined that it provided technical justification for the acceptance of reinforcing steel already installed. However, the determination of root cause had not been identified, nor actions to prevent recurrence.

(2). Conclusions

The results of the investigation into the failure of the reinforcing bar did not disclose any failure to meet material specification requirements or unexpected chemical or material defects. The failure of the bar resulted from excessive impact loading of a work hardened section. The use of sledge hammers to relocate reinforcing bars has been discontinued by the certificate holder.

The failure to meet ACI Code requirements for reinforcing bar minimum bend radius was identified as a violation of CAR Section 11.1.7.3.

7. Supplier/Vendor Inspection (IP 88115)

a. Georgia Institute of Technology

(1). Scope and Observations

The inspectors observed the certificate holder conduct an audit and corresponding surveillance activities at the Atlanta, Georgia campus of the Georgia Institute of Technology (Georgia Tech) Computer Aided Structural Engineering Center on January 3 and 4, 2008. The purpose of the certificate holder's audit was to evaluate Georgia Tech's implementation of their QA program relating to the acquisition, development, operation and maintenance

of computer software for nuclear facility structural engineering applications. In addition, the audit scope included review and evaluation of the appropriate software engineering controls such as software configuration management, problem reporting and corrective action, software design and design verification, implementation of standards, conventions, and the review of other work practices used to facilitate software life cycle activities. According to the certificate holder's procurement documents and audit plan, Georgia Tech supplied structural design language engineering software (GT STRUDL™) to the MOX MFFF to support the facility's structural design.

The inspectors reviewed the certificate holder's audit plan, scope, and overall audit objectives as well as information identified during a previous audit. The inspectors discussed the audit plan and objectives with the certificate holder. It should be noted that during the course of the audit, deficiencies were identified by the certificate holder and not the certificate holder's vendor. The objectives of the audit plan were clearly stated and primarily focused on the certificate holder identified issues. The audit checklist was adequate; however some of attributes covered were not stated in the objectives. Two members of the certificate holder's quality assurance (QA) organization conducted the audit. The inspectors verified that one individual was qualified as a lead auditor while the second individual was an auditor-in-training.

The inspectors observed the certificate holder's performance regarding the following activities: (1) pre-audit conference; (2) execution and performance of the audit investigation by two members of the certificate holder's QA organization; (3) identification, categorization, and summarization of deficiencies; and (4) the exit interview/post audit conference. The inspectors noted that the audit was conducted in a professional manner and adequately covered key programmatic aspects of the vendor's QA Program. Overall, the certificate holder's planned audit objectives were attained and the safety-significance of the vendor's activities was clearly communicated during the exit meeting. Throughout the audit, the certificate holder caucused and debriefed the inspectors of issues and the status of ongoing activities. The inspectors noted that the results of the certificate holder's audit culminated in the identification of two findings and three observations. The two findings of noteworthy significance identified programmatic deficiencies regarding less than adequate timeliness of completion of an annual audit and a less than adequate program for trend analysis of software error reports. At the conclusion of the audit, the certificate holder briefed the vendor regarding programmatic deficiencies and as a result, the vendor recognized the significance of the findings that were issued and was in the process of developing a response and subsequent corrective actions.

(2). Conclusions

Implementation of the QA program pertaining to the certificate holder's conduct of vendor audit activities for the Georgia Tech Computer Aided Structural Engineering Center was adequate. The certificate holder had attained planned audit objectives and had clearly communicated the identified deficiencies to the vendor. The certificate holder's audit culminated in the identification of two findings and three observations. The two findings of noteworthy significance identified programmatic deficiencies regarding less than adequate timeliness of completion of an annual audit and a less than adequate program for trend analysis of software error reports.

b. Premier Technology, Inc.

(1). Scope and Observations

The inspectors observed the certificate holder conduct surveillance activities at the Premier Technology, Inc. (PTI) facility located in Blackfoot, Idaho, from March 11–12, 2008. The inspection was performed to verify that appropriate QA controls were used or will be used during design, fabrication, inspection, testing, and ultimately, the delivery of components that have been designated as IROFS. The inspectors also assessed selected portions of MOX Services QA oversight of PTI.

MOX Services selected PTI as a QL-1 supplier for the static and seismic design, fabrication, inspection, testing, and delivery of 24 slab tanks, slab tank supports, and slab tank neutron absorption panels for the aqueous polishing (AP) process of the MFFF. In addition, PTI was selected to design, fabricate, inspect, test, and deliver 13 annular tanks, including the neutron absorption panels and the Colemanite grout for the annular tanks, for use in the AP process of the MFFF. MOX Services had designated the annular and slab tanks and the tank supports and neutron absorption panels as IROFS.

The inspectors observed the vendor's performance regarding implementation of their QA plan and implementing procedures. In addition, the inspectors performed physical facility tours and walk-downs observing in-process welding and fabrication activities. The inspectors observed effective implementation of the vendor's quality processes. Technical requirements, work instructions and drawings were readily available to the fabricators on the floor. PTI staff was knowledgeable of their work procedures and quality responsibilities. The inspectors noted the welding and fabrication areas were controlled from an occupational safety perspective and were clean with adequate controls to exclude foreign materials. No problem areas were noted.

The inspectors examined procurement and fabrication activities related to Premier Technologies' contract with Shaw/AREVA MOX Services. The inspectors reviewed selected procedures and records, observed activities and interviewed personnel. Based on the results of this inspection, inspectors noted one deficiency on which AREVA/MOX Services issued a Supplier Deficiency Report No. PTI-08-VS38-01.

The deficiency identified the lack of maintaining the appropriate controls on suppliers for the fabrication of annular and slab tanks. More specifically, PTI's audit of Robatel Industries (a subcontractor) was performed in accordance with American Society of Mechanical Engineers (ASME) NQA-2000. However, the contractual requirements flowed-down from AREVA/MOX services to PTI specified compliance to ASME NQA-1-1994 and 1995 Addendum. Additionally, the inspectors noted that checklists used in audits performed by PTI did not include the appropriate attributes to verify Title 10 Part 21 of the Code of Federal Regulations (10 CFR Part 21) reporting requirements. Subsequently, PTI proactively initiated CAR 08-07 to address the issue.

The inspectors noted that Robatel Industries had been approved as a supplier of the neutron absorption panels that will supply the neutron shielding for the annular tanks in accordance with MOX design specifications. PTI performed an audit to qualify this vendor to fabricate the neutron shield tank skirt. However, the PTI lead auditor who

performed audit verification activities did not document a written report summarizing the audit results of the activity audited. Additionally, the audit checklist specifically did not address 10 CFR Part 21 reporting of defects and non-compliances. Consequently, it was not clear that Robatel's QA Program contractually complied to NQA-1 1994/1995, prior to PTI approval and placement of Robatel on their Approved Supplier List. After the inspectors discussed this issue with PTI and MOX Services, PTI placed a restriction on Robatel, limiting their approval activities to only the fabrication of prototypes. PTI committed to initiate further corrective action by conducting an audit to qualify Robatel as a QL-1 supplier.

The follow-up on the supplier's deficiencies and subsequent corrective actions will be tracked as IFI (70-3098/2008-001-004: Lack of control by MOX Services vendor (PTI) on its suppliers on the fabrication of the annular and slab tanks).

(2). Conclusions

Effective implementation of the vendor's quality processes to meet applicable codes, standards and regulatory requirements was noted, with the exception of the lack of maintaining certain controls on subcontractors for the fabrication of annular and slab tanks. PTI had developed and implemented an adequate program to evaluate and correct conditions adverse to quality.

8. Exit Interview

The inspection scope and results were summarized on April 7, 2008. Although proprietary documents and processes may have been reviewed during this inspection, the proprietary nature of these documents or processes was deleted from this report. No dissenting comments were received from the certificate holder.

1. PARTIAL LIST OF PERSONS CONTACTED

Certificate Holder Personnel

J. Adair, Civil - Mechanical Engineering Manager
C. Berger, Quality Assurance Specialist
J. Bodden, Lead Auditor
W. Crisler, Quality Control Manager
W. Elliott, Engineering Vice-President
D. Gwyn, Regulatory Affairs Manager
J. Henard, Construction Engineer
P. Hooks, Quality Assurance Specialist
R. Justice, Quality Assurance (QA) Programs Engineer
D. Kehoe, QA Engineer
H. Lawrence, Construction Supervisor
D. Leach, Deputy Director, Mixed Oxide Fuel Fabrication Facility Project
O. Mendiratta, Licensing Engineer
T. Sau, Structural Engineer
G. Shell, QA Manager
G. Sheppard, Civil Engineer
D. Stinson, President and Chief Operating Officer
J. Vaughn, Civil Engineer

Georgia Institute of Technology Computer Aided Structural Engineering Center

L. Emkin, Ph.D., Co-Director
D. Key, Configuration Control Manager

Premier Technology

J. Kensel, Quality Engineering
D. Morgan, QA Manager
S. Raben, Project Manager
D. Sayer, President

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

National Nuclear Security Administration

K. Chacey, Assistant Deputy Administrator
S. Glenn, Project Engineer
C. Ramsey, MOX Site Project Manager
G. Smith, Project Manager

2. INSPECTION PROCEDURES (IPs) USED

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 88111	10 CFR, Part 21, Inspection-Facility Construction
IP 88115	Supplier/Vendor Inspection
IP 88130	Resident Inspection Program for On-Site Construction Activities
IP 88131	Geotechnical/Foundation Activities
IP 88132	Structural Concrete Activities

3. LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Item	Status	Description
70-3098/2008-01-01	Open	IFI: Review of Final CLSM Analysis (Section 4)
70-3098/2008-01-02	Open	VIO: Inadequate Disposition of Non-Conforming Rebar Splices (Section 5 (b))
70-3098/2008-01-03	Open	VIO: Failure to Meet ACI Code Requirements (Section 6 (c)).
70-3098/2008-01-04	Open	IFI: Lack of control by MOX Services vendor (PTI) on its suppliers on the fabrication of the annular and slab tanks (Section 7 (b)).

4. LIST OF ACRONYMS USED

ACI	American Concrete Institute
ADAMS	Agency-Wide Document Access and Management System
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
BAP	Aqueous Polishing Building
BMF	Manufacturing Facility Building
BMP	Manufacturing Building
BSR	Receiving Building
CAR	Construction Authorization Request
CFR	Code of Federal Regulations
CR	Condition Report
CLSM	Controlled Low Strength Material
DCS	Duke, Cogema Stone and Webster
DAR	Deficiency Action Request

ECR	Engineering Change Request
F	Fahrenheit
Georgia Tech	Georgia Institute of Technology
GT STRUDL	Georgia Tech Structural Design Language
IFI	Inspector Follow-up Item
IP	Inspection Procedure
IROFS	Items Relied on for Safety
MFFF	MOX Fuel Fabrication Facility
MOX	Mixed Oxide
MPQAP	MOX Project Quality Assurance Plan
NCR	Non Conformance Report
NDT	Non Destructive Test
NMSS	Nuclear Material Safety and Safeguards
NRC	Nuclear Regulatory Commission
NRMCA	National Ready Mix Concrete Association
psi	Pounds per Square Inch
PSSCs	Principle Structures, Systems, and Components
PTI	Premier Technology
QA	Quality Assurance
QC	Quality Control
QL	Quality Level
QORE	Geotechnical Engineering and Construction Materials Testing Laboratory
SC-1	Seismic Category
SDR	Supplier Deficiency Report
VIO	Violation

5. LIST OF DOCUMENTS REVIEWED

Specifications & Procedures

Shaw Areva Mox Services, Construction Specification DCS01-BKA-DS-SPE-B-09330-3, Section 03301, Placing Concrete and Reinforcing Steel for Quality Level 1a, 2, 3 and 4, 6/4/07

Baker Concrete Construction, Inc., Specification BPP-110, Concrete Placement, 10/11/07.

Drawings

Shaw AREVA MOX Services No. 01353, Revision 3, BAP, BMP & BSR Areas Concrete and Reinforcing Typical Details.

Shaw AREVA MOX Services No. 02360, Revision 4, BAP Area Concrete and Reinforcing Plan @ El. -17'-6.

CMC Rebar Carolinas No. BAP-FR03, Revision 4, BAP Bldg – Fdn Mat, Top Bars.

CMC Rebar Carolinas No. BAP-FR02, Revision 8, BAP Fdn Mat @ Elev -17'-6 Wall Dwls.

Engineering Change Requests

Engineering Change Request 000430, Revision 7, Controlled Low Strength Material (CLSM) Concrete.

Nonconformance Reports

Nonconformance Report QC-08-0203, February 6, 2008.

Nonconformance Report QC-08-0187, January 8, 2008.

Condition Reports

Condition Report 20080047, February 4, 2008.

Condition Report 2000060, February 7, 2008.

Miscellaneous Documents

Report DCS01-XGA-DS-CAL-B-01101-0, Study for Using Controlled Low Strength Material (CLSM) Locally and Analysis Update of BMF Structure, December 12, 2007.