



UNITED STATES
NUCLEAR REGULATORY COMMISSION

REGION II
SAM NUNN ATLANTA FEDERAL CENTER
61 FORSYTH STREET, SW, SUITE 23T85
ATLANTA, GEORGIA 30303-8931

April 18, 2007

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
07003098/2007002

Dear Mr. Stinson:

During the week of March 5-8, 2007, the US Nuclear Regulatory Commission (NRC) completed a quality assurance inspection of the design and procurement activities associated with the site preservation and pre-construction activities of the proposed Mixed Oxide Fuel Fabrication Facility (MFFF). The enclosed inspection report documents the inspection results, which were discussed on March 8, 2007, with you and other members of your staff.

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

Based on the results of this inspection no findings of significance were identified. However, we did note that your staff had identified several aspects of your quality assurance program that needed improvement.

In accordance with 10 CFR 2.390 of NRC's "Rules of Practice," this document 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-room/adams.html>.

D. Stinson

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

Sincerely,

/RA/

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

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

Enclosure: NRC Inspection Report 07003098/2007002
w/attachment

cc w/encl:

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

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E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO

U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.: 70-3098

Construction
Authorization No.: CAMOX-001

Report No.: 70-3098/2007-002

Certificate Holder: Shaw AREVA MOX Services

Location: Savannah River Site
Aiken, South Carolina

Inspection Dates: March 5-8, 2007

Inspectors: W. Gloersen, Team Leader, Region II (RII)
P. Bell, Quality Assurance Analyst, Office of Nuclear Material Safety and
Safeguards (NMSS)
J. Fuller, Construction Inspector, RII
M. Shannon, Senior Resident Inspector, MOX FFF
J. Tapia, P.E., Senior Reactor Inspector, RII
G. Wertz, Senior Resident Inspector, BWXT

Accompanying
Personnel: R. Jackson, Construction Inspector, RII
D. Seymour, Branch Chief, RII

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

Enclosure

EXECUTIVE SUMMARY

Shaw AREVA MOX Services
Mixed Oxide Fuel Fabrication Facility
NRC Inspection Report No. 70-3098/2007-002

This team inspection included activities conducted by inspectors and quality assurance specialists during normal shifts and involved observation and evaluation of the certificate holder's program for implementation of its quality assurance program. The scope of this inspection included design and design change activities; procurement activities; quality assurance plan implementation; management measures and controls; training; reviews, audits and assessments; the corrective action program; and effectiveness of the safety function interfaces. The inspection team identified the following observations of the certificate holder's programs:

Program Development and Implementation

- Procedures related to the qualification and certification of auditors and quality control personnel were in conformance with the requirements of the Mixed Oxide (MOX) Project Quality Assurance Plan (MPQAP) and records of certified individuals were found to be in accordance with procedural requirements.

Design and Documentation Control

- Documentation that identified the important steps in the design verification process, including sources of design inputs that supported the final design, was being maintained, adequately controlled, and verified in accordance with the MPQAP.

Control of Materials, Equipment, and Services

- The use of less than adequate hold tags for the segregation of structural reinforcing steel was observed. The certificate holder did not use the appropriate procedure to dedicate the commercially obtained engineered backfill used in the foundation. The noted deficiencies were promptly entered into the corrective action program (CAP).

Inspection, Test Control, and Control of Measuring and Test Equipment

- Inspection and test activities were documented and controlled by procedures that contained appropriate acceptance criteria. Test and measurement personnel were qualified, and measuring and test equipment was calibrated and maintained. The status of inspection and test activities was properly controlled.

Problem Identification, Resolution and Corrective Action

- The CAP met the requirements of the MPQAP; however, the threshold for identification of conditions adverse to quality was high and the process was considered difficult to use by the certificate holder's staff. As a result, both the total number of deficiencies reported and the percentage that were self-identified were low. The certificate holder recognized the CAP deficiencies prior to the inspectors' on-site review and improvements were already planned.

10 CFR, Part 21, Inspection-Facility Construction

- There was reasonable assurance that the certificate holder had established procedures to effectively implement the requirements of 10 CFR Part 21, "Reporting of Defects and Noncompliance." Appropriate controls and procedures were in place to assure the proper maintenance and storage of 10 CFR Part 21 records.

Control of the Electronic Management of Data

- The certificate holder had not adequately implemented provisions to control access to the MOX Services records storage facility at the Savannah River Site. Lower tier quality assurance procedures did not adequately implement the provisions of the QA record management program for the permanent storage of QA records. The noted deficiencies were promptly entered into the CAP.

Supplier/Vendor Inspection

- Quality control requirements for suppliers and vendors were implemented in accordance with the requirements of the MPQAP and the applicable project procedures. The Approved Suppliers List and commercial grade suppliers were appropriately reviewed and approved. Deficiencies were promptly entered into the CAP.

Safety Function Interfaces

- Design evolutions were proceeding from the preliminary design phase, through the final design phase. No findings of significance were identified.

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 (Inspection Procedure (IP) 88130)

The certificate holder's oversight of the preparation and implementation of site preservation activities (including placement of engineered backfill, proof rolling, density testing and compaction) continued throughout this reporting cycle. Mud mats had also been installed to minimize erosion of the excavated area. During this reporting cycle, no safety-related construction activities had commenced.

2. Program Development and Implementation (IP 88106)

a. Scope and Observations

The inspectors reviewed selected elements of the certificate holder's program associated with the functional organization and Quality Assurance Program (QAP) structure to ensure that the selected elements were in accordance with the approved Mixed Oxide (MOX) Project Quality Assurance Plan (MPQAP), Revision (Rev.) 3. Elements chosen for inspection included the organizational structure, Quality Assurance (QA) training and management assessments.

The certificate holder's organizational structure, functional responsibilities, and delegation authority were reviewed. The roles, responsibilities, and the interfaces of the various functional areas of the project were defined in Project Procedure (PP) 2-1, "Project Organization, Roles & Responsibilities," Rev. 7. The procedure also provided for the control of a project organizational chart which was maintained to reflect the organization and key personnel on the project. The chart was required to be reviewed and updated as the organization changed. The certificate holder plans to further clarify the organizational roles and authorities of the QA and Regulatory Affairs organizations. The inspectors verified that the certificate holder's organization was in conformance with the programmatic requirements of the MPQAP (Rev.3) and the organizational structure, functional responsibilities, delegations of authority, and interfaces for managing, performing, and assessing work, were properly established and functioning.

The process for the indoctrination, training, and qualification of personnel performing or managing quality affecting activities was reviewed. The requirements and methodology to ensure that personnel performing activities affecting quality received the appropriate training to perform their assigned work, including QA, were delineated in PP 1-3, "Project Training," Rev. 8. In addition to this procedure, the inspectors reviewed the training materials and lesson plan (LP-QA-MPQAP-001) used to indoctrinate all employees on the requirements of the MPQAP (Rev. 3). Discussions were held with the Training Manager and the QA Manager concerning the content of the training. The inspectors also reviewed procedures applicable to the certification of QA department personnel. PP 3-8, "Qualification and Certification of Auditors," Rev. 5 and PP 3-27, "Quality Control Personnel Certification," Rev. 1, were reviewed. The procedures conformed with the requirements of the MPQAP (Rev.3). Records of certified individuals were reviewed and found to be in accordance with procedural requirements.

The system of management assessments used to evaluate the effectiveness and implementation of the MPQAP (Rev. 3) was reviewed. The inspectors also verified that assessments addressed the technical adequacy of items evaluated. PP 3-11, "Assessments," Rev. 5, established the process for evaluating the quality, effectiveness, and efficiency of project work processes, products, and the QA program. The procedure implemented the MPQAP (Rev. 3) requirements for management assessments and internal QA surveillances. PP 3-2, "QA Program Reporting to Management," Rev. 2, described the process for regularly informing senior project management on the status of the implementation of the MPQAP (Rev. 3) and also established the process for identifying trends. The inspectors also reviewed the certificate holder's Fiscal Year (FY) 2007 Annual Audit Schedule, and FY 2006 Audit/Surveillance/Evaluation Schedule.

The certificate holder's program for assessments and audits evaluated the effectiveness and implementation of the QA program and included both independent planned and documented evaluations performed by the QA organization as well as line management directed assessments to verify self-compliance. Assessments were required to be performed at the following three levels: (a) Project Assessments - annual assessments, project-wide in scope, with a focus on overall effectiveness of project processes and programs; (b) Management Assessments - annual assessments focused on functional area processes and programs with a more in-depth and narrower focus; and (c) Activity Assessments - assessments normally focused on a single activity or process within a single work group. Both assessments and audits were required to be conducted in accordance with approved procedures by qualified personnel. The reviewed audit and assessment schedules indicated programs were commensurate with the schedule and importance of work. Documentation and distribution of findings to appropriate management for review and response were required. Interface with the MPQAP (Rev. 3) corrective action process to ensure timely and effective corrective action was an integral part of the overall program.

b. Conclusions

Procedures related to the qualification and certification of auditors and quality control personnel were in conformance with the requirements of the MPQAP (Rev. 3) and records of certified individuals were found to be in accordance with procedural requirements.

3. Design and Documentation Control (IP 88107)

a. Scope and Observations

The inspectors noted that the design control program was implemented by 19 engineering related procedures. The inspectors specifically reviewed engineering PP 9-3, "Design Control," and PP 9-21, "Engineering Change Requests" (ECR). These procedures provided the specific requirements for preparation, review and approval, and revision of design documents, system description documents, calculations, specifications, drawings, and other technical documents. The procedures provided specific steps for performing design document preparation, controlling design input data, performing confirmation requirement actions, performing design reviews, performing design verifications, obtaining proper approvals, control of changes, obtaining engineering change requests, performing

revisions, and record keeping requirements. The inspectors considered the procedures to be adequate, based on the detailed guidance provided in the procedures. The inspectors reviewed several items entered into the ECR program to ensure timeliness of resolution. The certificate holder's resolution of ECR issues was adequate.

The inspectors reviewed design control and QA implementing procedures associated with the generation of design documents. System Description Documents (SDDs) for the Powder Process Area Plutonium Dioxide (PuO_2) Can Receiving and Emptying Unit were reviewed by the inspectors. The inspectors reviewed preliminary information related to the manner in which design input and output requirements were identified and translated into design and functional requirements. Design information was organized in a manner that specified main functions, secondary functions, products, incoming materials, outgoing materials, required production capacity performance, as well as other technical basis information. Additional requirements examined by the inspectors included material, structural, mechanical, thermal, electrical and safety function requirements.

Correlating documents such as the Component Classification Summary (DCS-01-NDD-DS-NTE-M-22480) and the Functional Classification List were examined by the inspectors. This review examined the provisions used during design to identify unit specific technical classifications for structures, systems and components (SSCs) for the PuO_2 Can Receiving and Emptying Unit. Inspectors examined system description documentation to ensure that documents were appropriately reviewed by the certificate holder and the documents contained only the requirements pertinent to the systems technical bases. The inspectors reviewed the content of design documentation, programmatic and administrative controls, and the correlation of technical and performance requirements back to design-based information. The inspectors noted that important documents were controlled in a manner consistent with the requirements identified in the MPQAP (Rev. 3). The inspectors also noted that multi discipline engineering documents were reviewed in a timely manner and documents were uniquely identified including revision number and specific copy number. Additionally, mandatory revision description sheets captured revisions to controlled documents, which were logged, uniquely identified, and tracked.

The inspectors reviewed component safety and quality level classifications for items relied on for safety (IROFS) and principal SSCs associated with the Powder Process Area PuO_2 Can Receiving and Emptying Unit. The Component Classification Summary (DCS 01-NDD-DS-NTE-M-22480), comprehensively described unit specific technical classifications for the principal SSCs associated with the PuO_2 Can Receiving and Emptying Unit.

The inspectors reviewed the design verification process by examining the List of Design Documents (LDDs) for the Homogenizing and Pelletizing Unit, which was designated as a Quality Level (QL)-1a IROFS. The extent of completion of the design verification process was examined by the inspectors. The inspectors reviewed selected major system components and subsystem attributes, features of the design, and system interfaces, to determine that the design verification process was adequately controlled. The inspectors observed cases where insufficient data existed, and noted that the necessary steps were taken to place holds on unverified information, and steps were taken to prevent the inadvertent release of unverified design information to

other disciplines within the engineering organization. The inspectors noted that the LDDs provided a mechanism to capture this evolution and that they were used to update the status of design confirmation on verified and unverified information. Tracking and status updates were maintained and categorized.

b. Conclusions

Documentation that identified the important steps in the design verification process, including sources of design inputs that supported the final design were being maintained, adequately controlled, and verified in accordance with the MPQAP.

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

a. Scope and Observations

The inspectors reviewed the certificate holder's procurement program in order to assess the effectiveness of the program to control the procurement of QL-1 and QL-2 equipment and services with respect to the specified technical specifications and QA requirements. The inspectors noted that the certificate holder's procurement program was detailed in 18 procedures located in Project Procedures, Section 10, "Procurement." At the time of the inspection, only minimal equipment and services had been received onsite, therefore, the inspection team did not evaluate the effectiveness of the program.

The inspectors noted that PP 11-9, "Material Management and Control," was being revised at the time of the inspection. The inspectors' review of controls to ensure that only correct and accepted material, parts, and components were used, and the review of handling, storage, cleaning, packaging, shipping and preservation of items, was limited, due to the limited amount of equipment and parts received onsite at the time of this inspection.

At the time of the inspection, the certificate holder did not have a procedure or program in place for control of special processes. This area will be reviewed as necessary when special processes are identified.

PP 3-5, "Control of Non-Conforming Items," Rev. 0, was issued to detail the process for controlling items that do not conform to specified requirements. At the time of the inspection, structural reinforcing steel was the only material being received. The inspectors observed the certificate holder's receipt inspections for the structural reinforcing steel as it was unloaded on March 5, 2007. The certificate holder was appropriately segregating material that did not meet the specifications by using red hold tags attached to the deficient reinforcing steel bundles. The inspectors noted that the hold tags were made of heavy weight paper and were not weather resistant. The certificate holder had previously recognized this problem and provided samples of new weather resistant tags that had been ordered. The inspectors also noted that the certificate holder was routinely inspecting the hold tags to ensure that they remained attached. The inspectors identified a detached hold tag which was unsecured and resting on top of reinforcing steel bundle number 5AK-2. Although the tag was still

available, adverse weather conditions may have resulted in the loss of the tag and a corresponding failure to ensure segregation of nonconforming material. The certificate holder issued Deficiency Action Request (DAR) 07-023 to document the condition. The certificate holder's corrective actions will be reviewed during a subsequent inspection and will be tracked as an Inspector Followup Item (IFI) 70-3098/2007-02-01: Use of Less Than Adequate Hold Tags for the Segregation of Structural Reinforcing Steel.

PP 9-18, "Commercial Grade Item Evaluations," Rev. 1, was issued to detail the process for the procurement and acceptance of commercial grade items and services for use in IROFS. The procedure provided appropriate steps related to commercial grade item (CGI) dedication. The procedure also provided detailed guidance for preparing CGI evaluations, listing of typical critical characteristics, examples of critical characteristics for specific items, an annotated format for a typical CGI evaluation, instructions for a CGI receipt inspection dedication plan, guidance for determining sampling plans for CGI acceptance, and guidance for performing homogeneous lot formation determinations.

During the inspection, the inspectors noted that the certificate holder elected not to use PP 9-18 to dedicate the commercially obtained engineered backfill used in the foundation. Section 1.2 of the procedure requires, in part, that technical, quality and documentation requirements for CGIs be established and that acceptance criteria for CGIs for use as IROFS be defined. The engineered backfill material was purchased under Specification DCS01-WRT-DS-SPE-B-09304, "Excavation, Backfilling, and Compaction for Structures." The inspectors reviewed the results of laboratory and field testing performed on the engineered backfill and determined that the material satisfied the specification and design requirements. Consequently, there was no negative impact from failing to generate a dedication plan. The certificate holder issued DAR 07-026 to document this QA program requirement oversight. The certificate holder's corrective actions will be reviewed during a subsequent inspection and will be tracked as IFI 70-3098/2007-02-02: Less than Adequate Documentation to Dedicate Commercially Obtained Engineered Backfill Used in the MOX Fuel Fabrication Facility (MFFF) Foundation.

b. Conclusions

The use of less than adequate hold tags for the segregation of structural reinforcing steel was observed. The certificate holder did not use PP9-18 to dedicate the commercially obtained engineered backfill used in the foundation. The noted deficiencies were entered promptly into the corrective action program (CAP).

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

a. Scope and Observations

The inspectors reviewed selected elements of the certificate holder's program for inspection, test control, and control of measuring and test equipment. Since there were no ongoing construction activities, the inspectors' review was limited to previously installed engineered backfill and the protective 4-inch layer of concrete, also known as the "mudmat." The review served to ensure that selected elements of the engineered backfill and mudmat installation were in accordance with the approved MPQAP (Rev. 3) and Design Specification DCS01-WRT-DS-SPE-B-09304, "Excavation, Backfilling, and Compaction for Structures." Elements chosen for inspection included records of subgrade preparation, engineered backfill gradation and in-place density testing, and concrete compressive tests. During an inspection of the on-site laboratory, the inspectors observed ongoing concrete compressive testing and reviewed certification records of laboratory and field-testing personnel, and reviewed calibration records for selected measuring and test equipment.

Due to the certificate holder's activity schedule, only a limited amount of inspection and testing activities had been performed at the time of the inspection. The items reviewed during the inspection were in conformance with the requirements of the MPQAP (Rev. 3) and the design specification. The certificate holder's inspection activities were documented and controlled by procedures containing appropriate acceptance criteria. Personnel were qualified and measuring and test equipment was calibrated and maintained. The status of inspection and test activities was properly controlled.

b. Conclusions

Inspection and test activities were documented and controlled by procedures that contained appropriate acceptance criteria. Test and measurement personnel were qualified, and measuring and test equipment was calibrated and maintained. The status of inspection and test activities was properly controlled.

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

a. Scope and Observations

The inspectors reviewed the CAP requirements as described in MPQAP (Rev. 3), Section 16, "Corrective Action," and implemented in accordance with PP 3-6, "Corrective Action Process," Rev. 7. The inspectors discussed the CAP implementation with the QA Manager, QA Programs Manager, and responsible QA staff engineers, and reviewed several DARs. As specified in the MPQAP (Rev. 3), conditions adverse to quality (CATQ) were identified, investigated, evaluated for significance, reported, tracked, and trended. In addition, PP 3-6 provided guidance for the determination of NRC reportability, stop work notification, and root cause analysis (described in PP 3-25). The stated CAP goal was to prevent recurrence of

CATQ. The inspectors concluded that the certificate holder complied with the requirements of the MPQAP (Rev. 3) relative to the implementation of the CAP.

The certificate holder had already recognized, as described by the MOX Project management during the inspection entrance meeting, that improvements to the CAP were needed and planned. The certificate holder's assessment was that the CAP was considered punitive by the staff and, as a result, self-identified deficiency reporting was low. The inspectors reviewed DAR reporting and concurred since only 60 DARs were generated in 2005 and 36 DARs in 2006. Most DARs were initiated as a result of QA audits rather than self-identified by the staff. A review of QA audits for the periods of October 1, 2005, through March 30, 2006, and April 1, 2006, through September 30, 2006, confirmed that DAR self-identification goals of 40 percent were not met. In addition, the inspectors considered the 40 percent self-identification goal low.

The inspectors discussed with MOX project personnel several characteristics of the existing CAP that hindered DAR self-identification:

- The CAP required the DAR identifier to discuss the CATQ with the responsible manager and develop a corrective action plan to resolve the condition.
- The CAP had no process to allow anonymous DAR initiation.
- The CAP was managed in a written (paper) format (as opposed to an electronic system).
- The CAP required QA to review every DAR.

QA management discussed with the inspectors the planned CAP changes which included implementation of a graded-approach to problem identification. CATQs would be evaluated and categorized into four levels of DARs. This would allow smaller problems to be trended and corrected prior to becoming more significant. The certificate holder planned to develop a flow chart to detail the new CAP process. Additionally, the certificate holder indicated that the new CAP would also be electronic-based, anonymous, confidential and operationally responsive, per the QA Manager.

While the QA indoctrination of personnel performing quality affecting activities included the required elements specified in the MPQAP (Rev. 3) and implementing procedures, it was found to lack management's expectation and encouragement for the identification of problems adverse to quality. Both the QA and Training Managers concurred with this observation and informed the inspectors that they had planned to revise the training. QA management had noted that some project personnel had indicated a reluctance to generate a DAR.

The inspectors concluded that the planned changes would effectively improve the CAP and discussed the importance of implementation of the CAP improvements prior to the start of construction. The QA Manager agreed and initiated DAR 07-028 which

was scheduled for completion by July 31, 2007. The certificate holder's corrective actions will be reviewed during a subsequent inspection and will be tracked as IFI 70-3098/2007-02-03: Review CAP Improvements.

b. Conclusions

While the CAP met the requirements of the MPQAP (Rev. 3), the threshold for the identification of CATQ was high and the process was considered difficult to use by the certificate holder's staff. As a result, both the total number of deficiencies reported and the percentage that were self-identified were low. The certificate holder had already recognized the CAP deficiencies prior to the inspectors' onsite review and improvements were planned.

7. **10 CFR, Part 21, Inspection-Facility Construction (IP 88111)**

a. Scope and Observations

Through review of the MOX implementing QA procedures, the inspectors evaluated the certificate holder's program to determine conformance with Title 10 of the Code of Federal Regulations, Part 21, "Reporting of Defects and Noncompliance" (10 CFR Part 21).

The inspectors observed one location where the certificate holder had posted information as required by 10 CFR 21.6, "Posting Requirements." A sample of five procurement documents was reviewed by the inspectors to ensure that the certificate holder had properly specified, when applicable, that the provisions of 10 CFR 21.31, "Procurement Documents," was applied to the purchased material, equipment, and/or services. Through the review of program procedures and the review of one completed Part 21 evaluation, the inspectors verified that the certificate holder had properly implemented the requirements of 10 CFR 21.21, "Notification of Failure to Comply or Existence of a Defect and Its Evaluation." Additionally, the inspectors verified that the certificate holder had appropriate controls and procedures to assure the adequate maintenance and storage of Part 21 records.

The inspectors identified that the licensee had improperly marked procurement package number 10888-CP20-2A, Section F, "Special Conditions, Engineered Fill," in that a change to the original document was not initialed and dated. This method of correcting QA records is contrary to the requirements of Section 2.9, "Corrected Information in Records," of American Society of Mechanical Engineers (ASME) NQA-1-1994, "Quality Assurance Program Requirements for Nuclear Facilities, Supplement 17S-1," in that the date and the identification of the person authorized to issue such correction were not specified. Without the initials and date near the change, the certificate holder was unable to determine when and by whom the change was made. The certificate holder entered this issue in their corrective action program as DAR-07-025.

b. Conclusions

The certificate holder provided reasonable assurance that it had established procedures and program activities to effectively implement the requirements of 10 CFR Part 21, "Reporting of Defects and Noncompliance." The certificate holder had appropriate controls and procedures to assure the proper maintenance and storage of 10 CFR Part 21 records.

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

a. Scope and Observations

The inspectors evaluated the certificate holder's program to determine compliance with Section 17, "Quality Assurance Records," of the MPQAP (Rev. 3). 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 record storage facilities associated with the MOX project including the Savannah River Site (SRS) (Building 730-2B) document control center and the network operating center for the EDMS to ensure that QA records were identifiable, retrievable, and protected against larceny, vandalism, damage, deterioration, and loss.

The inspectors observed that the certificate holder had not adequately implemented provisions to control access to the MOX Services records storage facility at SRS Building 730-2B, in that measures were not established to preclude the entry of unauthorized personnel into the storage area. These measures were required by Section 17.2.4.A.8 of the MPQAP (Rev. 3) and Section 4.3, "Safekeeping," of ASME NQA-1-1994, Supplement 17S-1, to ensure that QA records would be adequately protected from larceny and vandalism. The certificate holder entered this issue in their corrective action program as DAR-07-027. The inspectors indicated to the certificate holder that this issue will be tracked as IFI 70-3098/2007-02-04: Review of Certificate Holder's Actions to Preclude Unauthorized Personnel Access to the MOX Services Records Storage Facility.

The inspectors identified that the certificate holder had not adequately implemented the provisions of their QA record management program for the permanent storage of QA records. Section 17.2.4, "Storing and Preserving QA Records," of the MPQAP (Rev. 3) states, in part, "Monthly, a tape of the entire records management system shall be placed in the Duke Energy & Services records storage area at the Duke Energy Records Center." The inspectors observed that the certificate holder had not removed the February 2007 back-up tapes from the network operating center and transported them to an off-site location. In this example, the tapes were required to be transported off-site at the end of February 2007, however, they had not been transported at the time of this inspection. The inspectors noted that the certificate holder had labeled, cataloged, and moved the February 2007 back-up tapes from the SRS on the day of discovery to an off-site storage location.

Additionally, the inspectors noted that the transfer of past EDMS monthly back-up tapes to an off-site location had not been documented. The inspectors identified that the certificate holder did not have adequate implementing procedures for the removal of these back-up tapes or for their temporary storage in an approved container. In addition to the monthly back-up tapes, the certificate holder did perform weekly tape back-ups of recent changes to documents stored on the EDMS.

The inspectors subsequently identified that the certificate holder had revised Section 17.2.4, "Storing and Preserving QA Records," of the MPQAP (Rev. 4, Change 1) by removing the above requirement regarding the monthly tape back-up. In a letter dated January 11, 2006, Duke Cogema Stone and Webster (DCS) submitted Rev. 4, Change 1 of the MPQAP to the NRC. The certificate holder stated in that letter, in part, "DCS has reviewed these changes [from Rev. 3] and determined there is no reduction in commitments for the design and construction activities." Rev. 4, Change 1 of the MPQAP includes a section for the description of changes from Rev. 3, which stated that this section was removed because the level of detail was inappropriate for this level document (MPQAP). However, the inspectors identified that the certificate holder had not addressed the details regarding the handling of the back-up tapes in lower tier implementing QA procedures.

The certificate holder immediately entered this issue in their CAP as DAR-07-029. This issue will be tracked as IFI 70-3098/2007-02-05: Inadequate Implementation of the Dual Storage Facilities Provision Stated in the MPQAP (Rev. 3).

b. Conclusions

The certificate holder had not adequately implemented provisions to control access to the MOX Services records storage facility at SRS Building 730-2B. Lower tier QA procedures did not adequately implement the provisions of the QA record management program for the permanent storage of QA records.

9. Supplier/Vendor Inspection (IP 88115)

a. Scope and Observations

The inspectors reviewed the quality requirements for suppliers and vendors as specified in MPQAP (Rev. 3), Section 7.0, "Control of Purchased Material, Equipment and Services." PP 3-12, "Supplier Evaluation," Rev. 6, and PP3-13, "Supplier Verification," Rev. 5, implemented the MPQAP (Rev. 3) supplier quality control requirements. The inspectors reviewed the Approved Suppliers List (ASL) and the associated supplier evaluation summary reports. Restrictions identified on the ASL were consistent with the approved MOX Supplier Evaluations. The inspectors selected a sample of suppliers to review. Except as noted in Section 4 of this inspection report, the commercial grade suppliers list and corresponding commercial grade item evaluations were performed and maintained on this sample of suppliers in accordance with the MPQAP (Rev. 3) requirements. Deficiencies identified by the certificate holder during the supplier evaluations were captured in the CAP.

b. Conclusions

Quality control requirements for suppliers and vendors were implemented in accordance with the requirements of the MPQAP (Rev. 3) and applicable project procedures. ASL and Commercial Grade Suppliers were appropriately reviewed and approved. Deficiencies noted by the certificate holder during the supplier evaluations were entered promptly into the CAP.

10. Safety Function Interfaces (IP 88116)

a. Scope and Observations

The inspectors reviewed this program area to determine if major components and their safety function interfaces were adequately controlled, such that the principal SSCs and IROFS could be maintained in accordance with the design bases of the Construction Authorization Request (CAR). The inspectors reviewed SDDs, which included a comprehensive description of the system, and both safety and non-safety features. The inspectors noted that SDDs were supported by detailed listings of interfacing systems. However, interfacing boundaries derived from various sources and subsystems had not been developed due to the early stage in the design evolution process. Currently, design evolutions were proceeding from the preliminary design phase, through the final design phase.

The inspectors noted that MOX Services was using guidance provided in "MFFF, Manufacturing Design Group (MDG) Conformance Phase, Work Package Implementation Plan" as a roadmap to identify design interfaces. The package provided guidance and interfaces for generating a starting point for the manufacturing conformance design and a method for tracking evolutions for use by the MDG design office in preparing detailed design, and for use by the Software Design Group for preparing updated process control functions. MOX Services also provided a one page plan detailing the design interfaces used in the design process. The guidance in the work package plan was adequate.

The inspectors examined the SDD for the Powder Process Area PuO₂ Can Receiving and Emptying Unit safety function interface with SSCs. The inspectors noted that interfacing SSCs included an upstream PuO₂ Buffer Storage Unit and a downstream Primary Dosing Unit. The inspectors reviewed system design requirements and their design basis, to ensure that components at or near interface boundaries were properly classified and all components necessary for the system met electrical, mechanical, structural, thermal, instrumentation and control interface, and design requirements of the SDD.

The physical location and layout of the system design did not currently identify the location of equipment or physical configuration. Therefore, due to ongoing design evolutions, the precise boundary of the system was indeterminate at the time of this inspection. Currently, PuO₂ Can Receiving and Emptying Unit function and design requirements were identified and included process operating experience gained from the reference plant at the MELOX Processing Facility located in France.

b. Conclusions

Design evolutions were proceeding from the preliminary design phase, through the final design phase. No findings of significance were identified.

11. Exit Interview

The inspection scope and results were summarized on March 8, 2007. Although proprietary documents and processes may have been reviewed during this inspection, the proprietary nature of these documents or processes were 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
P. Bishop, Construction Supervisor
J. Bourachot, Manufacturing Design Group Manager
J. Clemmens, Equipment Group Manager
D. Gwyn, Regulatory Affairs Manager
B. Hunt, Quality Assurance (QA) Engineer
D. Ivey, QA Engineer
R. Justice, QA Programs Manager
S. King, Vice President, Projects
D. Kehoe, QA Engineer
D. Leach, Deputy Director, MFFF Project
G. Shell, QA Manager
D. Stinson, President and Chief Operating Officer
J. Vaughn, Civil Engineer

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

National Nuclear Security Administration

K. Chacey, Assistant Deputy Administrator (via teleconference)
S. Glenn, Site Representative
T. Ober, QA Program Manager (via teleconference)
G. Smith, Project Manager

2. INSPECTION PROCEDURES (IPs) USED

IP 88106	Quality Assurance: Program Development and Implementation
IP 88107	Quality Assurance: Design and Documentation Control
IP 88108	Quality Assurance: Control of Materials, Equipment, and Services
IP 88109	Quality Assurance: Inspection, Test Control, and Control of Measuring and Test Equipment (interim use-for reference only)
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 Inspection
IP 88116	Inspection of Safety Function Interfaces for the Mixed Oxide Fuel Fabrication Facility
IP 88130	Resident Inspection Program for On-Site Construction Activities at the Mixed Oxide Fuel Fabrication Facility

3. LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

<u>Item</u>	<u>Status</u>	<u>Description</u>
70-3098/2007-02-01	Opened	IFI - Use of Less Than Adequate Hold Tags for the Segregation of Structural Reinforcing Steel (Section 4).
70-3098/2007-02-02	Opened	IFI - Less than Adequate Documentation to Dedicate Commercially Obtained Engineered Backfill Used in the MFFF Foundation (Section 4).
70-3098/2007-02-03	Opened	IFI - Review CAP Improvements (Section 6).
70-3098/2007-02-04	Opened	IFI - Review of Certificate Holder's Actions to Preclude Unauthorized Personnel Access to the MOX Services Records Storage Facility (Section 8).
70-3098/2007-02-05	Opened	IFI - Inadequate Implementation of the Dual Storage Facilities Provision Stated in the MPQAP (Rev. 3) (Section 8).

4. LIST OF ACRONYMS USED

ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
ASL	Approved Suppliers List
CAP	Corrective Action Program
CAR	Construction Authorization Request
CATQ	Conditions Adverse to Quality
CGI	Commercial Grade Item
DCS	Duke Cogema Stone and Webster
DOE	Department of Energy
DAR	Deficiency Action Request
ECR	Engineering Change Request
EDMS	Electronic Document Management System
FY	Fiscal Year
IFI	Inspector Followup Item
IP	Inspection Procedure
IROFS	Item Relied on for Safety
LDD	List of Design Documents
MDG	Manufacturing Design Group
MFFF	MOX Fuel Fabrication Facility
MOX	Mixed Oxide
MPQAP	MOX Project Quality Assurance Plan

NNSA	National Nuclear Security Administration
NRC	Nuclear Regulatory Commission
PP	Project Procedure
PuO ₂	Plutonium Dioxide
QA	Quality Assurance
QAP	Quality Assurance Program
QL	Quality Level
Rev.	Revision
SDD	System Description Document
SSCs	Systems, Structures, and Components
SRS	Savannah River Site

5. LIST OF DOCUMENTS REVIEWED

Specifications and Procedures

PP 1-3, Project Training, Rev. 8
 PP 2-1, Project Organization, Roles & Responsibilities, Rev. 7
 PP 3-2, QA Program Reporting to Management, Rev. 2
 PP 3-4, Records Management, Rev. 4
 PP 3-5, Control of Non-Conforming Items, Rev. 0
 PP 3-6, Corrective Action Process, Rev. 7
 PP 3-8, Qualification and Certification of Auditors, Rev. 5
 PP 3-12, Supplier Evaluation, Rev. 6
 PP 3-13, Supplier Verification, Rev. 5
 PP 3-25, Root Cause Analysis, Rev. 2
 PP 3-27, Quality Control Personnel Certification, Rev. 1
 PP 7-4, Document Control, Rev. 5
 PP 7-9, Electronic Document Management System, Rev. 1
 PP 8-3, Evaluation and Reporting of Defects and Noncompliance (10 CFR Part 21), Rev. 1
 PP 9-3, Design Control, Rev. 13
 PP 9-18, Commercial Grade Item Evaluations, Rev. 1
 PP 9-21, Engineering Change Requests (ECR), Rev. 3
 PP 10-8, Requisitioning Items and Services, Rev. 4
 PP 11-9, Material Management and Control (canceled on December 11, 2006)

Miscellaneous Documents

BMP – Level 01 - Room B119, Homogenizing and Pelletizing Unit list of Design Documents
 Commercial Grade Item Evaluation, Quality Level 1a, DCS01-ASI-DS-CGD-R-65815-1
 Component Classification Summary DCS-01-NDD-DS-NTE-M-22480
 DAR-06-014, Software Usage Form Not Listed in Software Baseline List
 DAR-06-016, Drawings Issued Without Referencing Design Input Data
 DAR-06-029, Project Personnel Not Completing Training on Schedule
 DAR-06-032, Specifications Not Revised for Inclusion in Procurement Packages
 DAR-07-001, Specifications Contain Conflicting Requirements

DAR-07-007, Conflict in Procedure Requirements
DAR-07-008, Non-compliance with Commercial Grade Item Evaluation
DAR-07-014, MOX Project Records Not Recoverable from EDMS
DAR-07-025, Improper Marking of Procurement Package Number 10888-CP20-2A
DAR-07-027, Personnel Access to the MOX Services Records Storage Facility
DAR-07-028, Corrective Action Program
DAR-07-029, Dual Storage Facility Requirements for QA records
Functional Classification List
MFFF MDG Conformance Phase Work Package Implementation Plan
MOX Approved Suppliers List, Rev. 52, January 25, 2007
MOX Commercial Grade Suppliers List, Rev. 00, February 8, 2007
Nuclear Criticality Safety Evaluation (NCSE-D) of PuO₂ Can Receiving and Emptying Unit
Powder Process Area PuO₂ Can Receiving and Emptying Unit (NDD) System Description
Document
Process Hazards Analysis of the MOX Fuel Fabrication Facility - Power Workshop
QA Program, Reporting Period 013, Covering 1 Oct 2005 through 31 Mar 2006
QA Program, Reporting Period 014, Covering 1 April 2006 through 30 September, 2006
QA Source Surveillance Report, FAI-06-VS01
QA Source Surveillance Report, ECM-06-VS01
Part 21 Evaluation Log Number: 2005-01
Procurement Package 10888-CP20-2A, Engineered Fill
Procurement Package 10888-CP20-2B, Rebar
Procurement Package 10888-CP20-2C, Embedded Plate
Procurement Package 10888-CP20-2D, Embedded Pipe
Procurement Package 10888-R0005, Gloveports
Supplier Evaluation Summary Report, ECM-06-VE19
Supplier Evaluation Summary Report, ANI-07-VE08
Supplier Evaluation Summary Report, ANI-06-025
Supplier Evaluation Summary Report, MOTT-06-VE06
Supplier Evaluation Summary Report, PTI-06-VE23
Supplier Evaluation Summary Report, HOS-06-VE22