

May 29, 2003

MEMORANDUM TO: Kathy H. Gibson, Acting Chief  
Special Projects and Inspection Branch  
Division of Fuel Cycle Safety  
and Safeguards  
Office of Nuclear Material Safety  
and Safeguards

THRU: Joseph G. Giitter, Section Chief */RA/*  
Special Projects Section  
Special Projects and Inspection Branch  
Division of Fuel Cycle Safety  
and Safeguards, NMSS

FROM: Wilkins R. Smith, Quality Assurance Specialist  
Special Projects Section  
Special Projects and Inspection Branch  
Division of Fuel Cycle Safety  
and Safeguards, NMSS

SUBJECT: SUMMARY OF IN-OFFICE REVIEWS AT DUKE COGEMA STONE &  
WEBSTER OF QUALITY ASSURANCE ISSUES FOR THE MIXED  
OXIDE FUEL FABRICATION FACILITY

### **Executive Summary**

This summary of the in-office reviews of the Duke Cogema Stone and Webster (DCS) (the applicants') quality assurance program for the Moxed Oxide (MOX) Fuel Fabrication Facility (MFFF) was prepared subsequent to the issuance of the MFFF revised draft evaluation report (DSER) for construction authorization. The need to further document in-office reviews of the quality assurance program was identified during the staff's review of the DSER. These reviews were conducted at the DCS offices in Charlotte, North Carolina on August 6-8, 2002, and December 20, 2002, the DCS offices in Aiken, South Carolina on August 27, 2002, and the Cogema/SGN offices in Bagnols-sur-Ceze, France on September 11-13, 2002. DCS MFFF project personnel at these offices were performing MFFF design, engineering and QA activities in accordance with the DCS MOX Project Quality Assurance Plan (MPQAP). QA issues addressed during the in-house reviews included QA organization and functional responsibilities, team/subcontractor QA controls, procurement QA, items relied on for safety (IROFS) definitions, quality level (QL) categorization process, methods and criteria, and graded application of QA controls. The applicant's design, document and record control procedures, procurement QA plans, and selected documentation were reviewed. The applicant responded to questions from NRC staff about the MPQAP, QA procedures, and interpretation and implementation of QA requirements for the MOX fuel fabrication facility project activities.

The MPQAP, Revision 2, with additional clarifications and commitments, was approved by the NRC for MFFF design and construction applications on October 1, 2001. The in-office reviews

conducted in 2002 were a part of the NRC review of Revision 3 of the MPQAP, which incorporated the additional DCS clarifications and commitments. The MPQAP, Revision 3, was approved by the NRC on January 10, 2003. The in-office reviews were also a part of the NRC review of the MFFF Construction Authorization Request (CAR). A summary of the September 11-13, 2002 In-Office Review was documented in a foreign travel trip report issued on October 23, 2002.

### **In- Office Review Details**

#### **DCS Charlotte, North Carolina Office, August 6-8, 2002**

During August 6-8, 2002, David Brown and Wilkins Smith, from the Division of Fuel Cycle Safety and Safeguards, conducted an in-office review to evaluate QA issues for the MFFF project. The Charlotte office of DCS was the primary MFFF project location for management, engineering and QA activities. The MPQAP applies to all applicable DCS MFFF project activities, including the MOX fuel fabrication process design being conducted by SGN (a wholly owned subsidiary of Cogema). The NRC staff reviewed the QA organization, staffing, reporting independence and functional responsibilities, and the application of the MPQAP to the team/subcontractor project activities. The staff also reviewed the methodology and procedures for QA design controls for structures, systems and components (SSCs), including determination of quality levels, designation of IROFS, and graded QA applications. DCS presented examples of QA systems implementation and design control processes and products, and responded to questions from FCSS staff about the MPQAP and its implementation for the MOX fuel fabrication facility project activities.

Staff reviewed the following DCS QA procedures for design control and related activities:

- “Design Control,” PP 9-3, Revision 7;
- “Design Process,” PP9-14, Revision 2;
- “Quality Assurance Grading,” PP1, Revision 0;
- “SSC Quality Levels & Marking Design Documents.”

The staff also reviewed a Design Requirements Document (DRD) D-1401-E, which identified the MFFF baseline design requirements and establishes the design process safety philosophy. The staff review identified DRD statement that a systematic overcheck verification or double-checking of incoming depleted uranium dioxide powder for uranium isotopics was not required. The staff and DCS discussed the basis for this statement and the requirements for verifying depleted uranium isotopics, and planned additional discussion of this issue during the review and evaluation of IROFS and management measures, which would be a part of NRC’s review of a MFFF license application.

The NRC reviewers reviewed the DCS document and records control management system, identified as Documentum. The Documentum computer system emulates a hard copy system, and is intended to function as the actual document and records storage location as well as management system. It will also permit configuration management tracking back to the design and engineering history, including as-built drawings, QA records and non-conformances.

Staff also reviewed the following selected engineering design documents related to the Jar Storage and Handling Unit glovebox:

- MOX Fuel Fabrication Facility Technical Specification for Jar Storage and Handling Unit (NTM), QL-1a, DCS01-NTM-DS-CCT-M-18151-A;
- Process Equipment Qualification Procedure (Preliminary), QL-1a, DCS01-ZMJ-DS-SPE-M-19105-A; and
- Process Equipment Mechanical Design Requirements (Preliminary), QL-1a, DCS01-ZMJ-DS-SPE-M-19102-A.

The review of the engineering design documents was to determine, for this specific area, how safety functions identified in Chapter 5 of the Construction Authorization Request (CAR) flowed into technical specifications, functional requirements, and QL classification in glovebox engineering design documents. The staff found that safety functions were adequately described for this process unit in section 2.3 of the Technical Specification. The Component Functional Classification List in Appendix D of the Technical Specification lists internal glovebox fire detection and suppression components as QL-2. The staff noted that this classification may not be consistent with the safety function of Glovebox Fire Protection Features, a new principal SSC described in the DCS letter to NRC dated March 8, 2002 (DCS-NRC-000085). Staff previously requested additional clarification of the safety function(s) of Glovebox Fire Protection Features, and the staff planned additional discussion of the QL classification after the safety function is clarified.

#### **DCS Aiken, South Carolina, August 27, 2002**

During August 6-8, 2002, Drew Persinko and Wilkins Smith, FCSS, conducted an in-office review at the DCS Aiken, South Carolina office. The purpose was to evaluate the MFFF QA program application for the MFFF project activities. The Aiken office had approximately 50 engineering, QA and administrative personnel. The activities primarily focus on equipment and manufacturing design for the MFFF. As the project progresses, the Aiken location would expand for management, engineering, QA, and construction related activities. The MPQAP applies to all applicable DCS MFFF project activities. The NRC staff reviewed the Aiken organization, staffing, reporting and functional responsibilities, and the application of the MPQAP to the Aiken project activities. The staff also reviewed selected design documents including:

- DCS01-NTM-DC-CCT-M-18151-A, "MFFF Technical Specification for Jar Storage and Handling Unit;
- DCS01-NTM-CG-NTE-M-00243-B "Lessons Learned from Experience at Melox and U.S. Specific Changes, Powder Process Area Jar Storage and Handling Unit."

The project QA procedures for design control were reviewed and discussed with DCS QA and engineering personnel. No findings were noted by the reviewers.

#### **DCS (SGN) Bagnols-sur-Ceze, France, September 11-13 , 2002**

During August 6-8, 2002, Drew Persinko and Wilkins Smith, FCSS, conducted an in-office review to evaluate the QA program being applied in France to the design and engineering of the

U.S. MFFF project. The review was conducted at Cogema/SGN offices in Bagnols-sur-Ceze, France. SGN, a wholly owned subsidiary of Cogema and a DCS team member and subcontractor, is doing most of the process design and manufacturing engineering integration for procurement for the MFFF. DCS and Cogema/SGN are also doing much of the software engineering and design in France for the MFFF manufacturing, instrumentation and safety controls. The in-office review was scheduled to coincide with the performance of an internal DCS QA audit of SGN in order to observe and evaluate the DCS audit program implementation as well as SGN QA implementation for MFFF activities. The NRC reviewers also performed independent reviews of the SGN implementation of the MPQAP requirements.

The NRC staff reviewed the QA organization and functional responsibilities, and the application of the MPQAP to the SGN project activities. The staff also reviewed the applicable QA requirements, procedures and implementation for management assessments, training, design control, document and records control, and software QA. The processing and control of design drawings, specification and other documents were reviewed. The design, document and record control procedures and selected documentation were reviewed. DCS and SGN personnel responded to questions from NRC staff about the MPQAP, QA procedures, and interpretation and implementation of QA requirements for the MFFF project activities.

The DCS auditors reviewed training, design control, control of documents and records, software QA and management assessments. The DCS QA audit appeared to be thorough and in accordance with the MPQAP and QA procedure requirements. No significant findings were noted by the DCS auditors, however they did observe a number of areas of inadequate implementation or documentation of QA requirements. These included control of documentation of delegation of organization responsibility, lack of, or delayed training of personnel on new procedural requirements, software control procedure adequacy and compliance, QL assessment and documentation, and lack of required activity assessments. These observations did not appear to affect the quality of the design activities or products, and DCS planned actions to resolve observations. The NRC reviewers noted that the DCS audit findings and conclusions, and planned actions appeared to be appropriate. The NRC reviewers, as a result of the DCS audit and NRC in-office review observations, recommended that DCS evaluate the need for more coordination and interaction between DCS QA personnel in the U.S. and France on QA MPQAP and QA procedure requirements, applicability and implementation.

This in-office review, as well as a meeting with French regulators and site visits to MELOX and LaHague facilities, was previously documented in a foreign travel trip report issued October 23, 2002 (ML022960305).

#### **DCS Charlotte, North Carolina Office, December 20, 2002**

On December 20, 2002, Wilkins Smith, FCSS, conducted an in-office review to evaluate QA issues for the MFFF project. The NRC reviewer examined the DCS QA organization, staffing, and functional responsibilities, and the application of the MPQAP to the team/subcontractor project activities. The staff reviewed the applicant's procurement and QA audit activities and results, and plans for audits of internal activities, team members, major subcontractors and potential vendors. The implementation of the MPQAP, Revision 3, and plans for a future revision to address startup testing and operations were discussed. The status of the applicant's

development and application of the MPQAP process, criteria, and methods for categorization of SSCs and grading of QA controls was reviewed. The NRC reviewer observed that the DCS QA program effectiveness reviews had noted a concern with the timely completion of corrective

actions (C/A) for identified deficiencies. DCS QA was providing monthly status reports on C/A program status to management on a monthly basis. The QA program implementation observed, and documentation reviewed, were in accordance with the MPQAP commitments and QA procedure requirements, and were adequate and appropriate for the activities.

May 29, 2003

actions (C/A) for identified deficiencies. DCS QA was providing monthly status reports on C/A program status to management on a monthly basis. The QA program implementation observed, and documentation reviewed, were in accordance with the MPQAP commitments and QA procedure requirements, and were adequate and appropriate for the activities.

Docket: 70-3098

|                          |                            |
|--------------------------|----------------------------|
| cc: J. Johnson, DOE      | L. Zeller, BREDL           |
| G. Carroll, GANE         | J. Conway, DNFSB           |
| D. Curran, Esq., DCS     | P. Hastings, DCS           |
| D. Silverman, Esq., GANE | H. Porter, SC Dept. of HEC |

DISTRIBUTION: Docket No.: 70-3098 ADAMS Public FCSS r/f SPIB r/f Hearing File  
DAyres, RII BSmith, EDO RVirgilio, OSP JHull, OGC

**ML031320355**

G:\FCSS\SPB\WRS\MOXQAINOFFICEREVIEWSUMM2002.wpd \*See previous concurrence

|             |            |  |           |  |           |  |           |  |
|-------------|------------|--|-----------|--|-----------|--|-----------|--|
| <b>OFC</b>  | SPIB*      |  | SPIB*     |  | SPIB*     |  | SPIB      |  |
| <b>NAME</b> | WSmith     |  | LGross    |  | APersinko |  | JGitter   |  |
| <b>DATE</b> | 5 / 12 /03 |  | 5/ 15 /03 |  | 5/ 13 /03 |  | 5/ 29 /03 |  |

**OFFICIAL RECORD COPY**