

September 11, 2003

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

THRU: Brian W. Smith, Acting Chief **/RA/**
Special Projects Section
Special Projects and Inspection Branch
Division of Fuel Cycle Safety
and Safeguards, NMSS

FROM: Scott A. Gordon, Student Engineer **/RA/**
Wilkins R. Smith, Quality Assurance Scientist **/RA/**
Special Projects Section
Special Projects and Inspection Branch
Division of Fuel Cycle Safety
and Safeguards, NMSS

SUBJECT: AUGUST 20-21, 2003, IN-OFFICE REVIEW SUMMARY: DUKE
COGEMA STONE AND WEBSTER QUALITY ASSURANCE PROGRAM
FOR THE MIXED OXIDE FUEL FABRICATION FACILITY

On August 20-21, 2003, U.S. Nuclear Regulatory Commission staff conducted an in-office review of the quality assurance program implementation for the Duke Cogema Stone & Webster Mixed Oxide Fuel Fabrication Facility. A detailed summary of the meeting is attached.

Attachment: Meeting Summary

Docket: 70-3098

cc: P. Hastings, DCS
L. Zeller, BREDL
G. Carroll, GANE
J. Johnson, DOE
J. Conway, DNFSB
D. Curran, GANE
D. Silverman, DCS
H. Porter, SCDHEC

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DATE	9/ 09 /03	9/ 09 /03	9/ 10 /03	9/ 11 /03

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**MEETING SUMMARY
MOX FUEL FABRICATION FACILITY
August 20-21, 2003**

Executive Summary

The Nuclear Regulatory Commission (NRC) conducted an in-office review of the Duke Cogema Stone and Webster (DCS) quality assurance (QA) program implementation for construction activities, including design and procurement, for the proposed Mixed Oxide (MOX) Fuel Fabrication Facility (MFFF). This review was conducted at DCS offices in Charlotte, North Carolina, on August 20-21, 2003. The purpose of the in-office review was to discuss the status of the QA program and to evaluate the implementation of design, engineering, and QA activities in accordance with the DCS MOX Project Quality Assurance Plan (MPQAP).

QA issues addressed during the in-office review included QA organization and functional responsibilities, validation planning process, procurement QA, and selected issues related to the MFFF Construction Authorization Request (CAR). The applicant's project procedures, self assessment reports, and selected management 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 MFFF project activities.

In-Office Review Details

DCS Offices, Charlotte, North Carolina, August 20-21, 2003

During August 20-21, 2003, Andrew Persinko, Wilkins Smith, and Scott Gordon conducted an in-office review to evaluate the DCS QA program implementation for the proposed MFFF. The staff had an introductory meeting with a number of DCS senior managers and staff to receive an update from the previous in-office review (June 9-11, 2003) and to discuss the current agenda. The following were the main areas that the staff reviewed:

- Processing of Deficiency Action Requests (DARs)
- Status of Management Assessments for various DCS project functions
- Quality assurance planning for procurement program
- Review of "Validation Planning Process"
- Review of design analyses, technical calculations, and studies submitted in support of the MFFF Construction Authorization Request (CAR)

Processing of Deficiency Action Requests (DARs)

The staff reviewed the DCS Corrective Action Status Report for August 2003, which describes specific DARs with their associated current and next steps. DCS project and QA management noted that the timeliness of DAR closure is improving, however, DCS management expects further shortening of the DAR closure cycle time. The staff reviewed a number of DARs for safety and program significance and adequacy of corrective action. One DAR of interest (DAR-03-043) concerned submittals to NRC, in support of the CAR, that contained errors. Five such instances were noted in that DAR, including calculations for a hydroxylamine nitrate (HAN) model and the Oak Ridge Criticality Validation Report, both of which are discussed below in separate sections. The status, resolution of the deficiencies, and actions on this DAR will be reviewed by the NRC staff in a future in-office review.

Attachment

Status of Management Assessments for various DCS project functions

DCS performs annual management assessments to gauge effectiveness of the project activities, identify problems, good practices, and issues needing management attention and action, and to provide recommendations for further improvement. DCS performs assessments for the following functional areas:

- Quality Assurance
- Project Services and Administration
- Procurement
- Engineering and Construction
- Environmental Safety and Health
- Project Controls
- Process Design Group
- Licensing
- Project Manager

These management assessments also identified a number of recommendations to further improve project functional areas. The improvements, identified in DARs and other management reports, included enhancements to procurement procedures, corrective action databases, and functional interfaces. At the time of the in-office review, the staff noted that the assessment for the Process Design Group was in the “Activity Assessment” stage, while the Project Manager was in the “Working” stage. The assessments for the rest of the areas had been completed.

Quality assurance planning for procurement program

The staff noted that much of the equipment for the MFFF will be procured from vendors rather than built on-site. Any MFFF procurement of items relied on for safety is required to have adequate QA provisions. These may include a condition for the vendor to have a documented QA program that implements the criteria described in DCS’ MPQAP. Currently, DCS is pursuing vendors for the sintering furnace, glove boxes, and CARTRAC transfer system.

Review of “Validation Planning Process”

During the previous in-office review (June 9-11, 2003), the staff reviewed the DCS MFFF validation planning process. During this in-office review, the staff requested an update and proposed outcome of this process. Validation planning is DCS’ strategy to procure, assemble, test, and accept process units. The validation planning process is an approach for looking ahead and identifying potential difficulties during design, procurement, and construction, determining the inspections or actions that would prevent or mitigate the issues, and estimating the appropriate actions, inspections, and time frame from a benefit-cost analysis. The staff noted that DCS expects the validation planning process to result in a planning document, which could be used by the staff in efficiently planning and conducting the NRC construction inspection program for the MFFF.

Review of design analyses, technical calculations, and studies submitted in support of the MFFF Construction Authorization Request (CAR)

In a May 30, 2003, letter to NRC, DCS presented its process and development of calculations for the HAN model. During a July 22, 2003, on-site meeting at DCS offices in Charlotte, NC, staff reviewed a calculation which supported a model different than the May 30 model. During a

July 29, 2003, meeting, DCS presented a third model which was slightly different than the previous May 30 and July 22 versions. Discrepancies were noted by the NRC staff and, subsequently, by DCS. Further investigation into this matter is being done by DCS, under DAR-03-043 as noted above, to determine the cause for the deficiencies and identify actions needed to correct them and prevent recurrence.

Oak Ridge National Laboratory (ORNL) was contracted by DCS to perform sensitivity/uncertainty analyses using the SCALE5 computer program to support DCS' Criticality Validation Report. The staff recognized inconsistencies in this report and brought them to DCS' attention. DCS stated that the DCS task authorization categorized the ORNL study as Quality Level (QL) -4, and, therefore, QA was not required. DCS further stated that the errors did not significantly effect their use of the studies contained in the report. Further investigation into this matter is being done by DCS, under DAR-03-043 as noted above, to determine the cause for the discrepancies and identify actions needed to correct them and prevent recurrence. The basis and justification for the QL-4 categorization will be evaluated by the staff during a future in-office review which will audit the QL categorization process.

In-Office Review Results

The staff concluded, in general, for the areas and activities reviewed, that the appropriate requirements of the DCS MPQAP had been, or were being, adequately implemented. As noted above, the staff will review the completion and results of the processing of DAR-03-043 during a future in-office review. The DAR process and QL categorization process will also be audited in a future in-office review.