



DUKE COGEMA
STONE & WEBSTER

Mr. Andrew Persinko, MOX Project Manager
U.S. Nuclear Regulatory Commission
MS T8A33
Washington, DC 20555

22 June 2000
DCS-NRC-000015

SUBJECT: Docket Number 070-03098
Duke Cogema Stone & Webster
Mixed Oxide (MOX) Fuel Fabrication Facility
Justification for Use of Cogema/SGN QA Program for
Process Design Activities

Dear Mr. Persinko:

At our 16-17 November 1999 technical exchange, the NRC/NMSS staff requested clarification of the relationship between the Cogema/SGN QA program and the DCS QA program. A description of the relationship between those programs is enclosed. This document includes DCS' conclusion that the oversight of activities conducted under the Cogema/SGN program in support of MOX Fuel Fabrication Facility (MFFF) design efforts is appropriate and effective.

This paper is being provided in parallel with the formal submittal of the DCS QA Program in support of MFFF licensing efforts. If you have any questions regarding the enclosed information, please contact me at (704) 373-7820.

Sincerely,

Peter S. Hastings
Licensing Manager

*Added Dwight Walker
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Rec'd from NMSS
12/17/01*

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JUSTIFICATION FOR DUKE COGEMA STONE & WEBSTER (DCS) USE OF COGEMA/SGN QUALITY ASSURANCE PROGRAM

BACKGROUND

Duke Engineering & Services, Inc., COGEMA, Inc., and Stone & Webster Engineering Corporation joined forces to deliver to the U.S. Department of Energy (DOE) a team (DCS) with the core competencies and experience necessary to design, build, operate and deactivate a Mixed Oxide (MOX) Fuel Fabrication Facility (MFFF) and provide Irradiation Services in assisting DOE's mission for the disposition of U.S. surplus, weapons usable plutonium. DCS has developed a controlling MOX Project Quality Assurance Plan (MPQAP) that establishes the quality assurance (QA) requirements to be met by DCS and subcontractor personnel in performing quality affecting work. This QA plan provides for the use of acceptable selected subcontractor QA Programs and implementing procedures.

The decision to structure the MPQAP to use selected subcontractor QA programs to perform work on the DCS MOX Fuel Project was based on:

- A. DCS's desire to take advantage of the effective QA Programs that had resulted in the successes that justified DCS's selection of these companies to work on the DCS MOX Fuel Project;
- B. DCS's desire to authorize use of acceptable QA Plans and implementing procedures to minimize training on new procedures and allow continuity of implementation of proven programs. Use of proven, acceptable methods obviates the added risk of error were a new plan imposed; and
- C. DCS QA Manager's review and acceptance of selected subcontractor QA Plans for their respective assigned statements of work.

This approach was presented to the U.S. Nuclear Regulatory Commission (NRC) Office of Nuclear Materials Safety and Safeguards (NRC/NMSS) during a technical exchange meeting on November 16, 1999 including the NRC, DCS and DOE. At that meeting the NRC asked that DCS further explain and justify using the COGEMA/SGN QA Program since this program had not come under U.S. NRC regulations to date.

The purpose of this document is to justify the use of the COGEMA/SGN QA Program for the process design of the MFFF.

HISTORY OF THE COGEMA/SGN QA PROGRAM

SGN personnel have been involved in the development of the European nuclear fuel cycle industry since 1952. In that year, CEA (the French Atomic Energy Commission)

requested that Saint-Gobain (a French owned engineering firm) create a new nuclear department to design the first French spent fuel reprocessing facilities. In 1960, this nuclear department became "SGN", a subsidiary of Saint-Gobain. Meanwhile, CEA also created a new department "SCU" (Service de construction des Usines) as the "Prime Contractor" for the construction of nuclear facilities. In 1976, SCU became "COGEMA", a subsidiary of CEA. In 1978, COGEMA acquired 60% of SGN, Saint-Gobain holding the remaining 40%. A few months later, COGEMA acquired 66% of SGN with TECHNIP (world - class group providing engineering and construction services) holding the remaining 34%. In 1997, SGN became a wholly owned subsidiary of COGEMA.

Since the beginning of its activities, SGN, as a nuclear engineering company, has developed its own Quality Assurance Program (Quality Assurance Manual and implementing procedures). This QA program was based on Title 10 of the U.S. Code of Federal Regulations Part 50 (10CFR50), Appendix B, *Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants*, and associated American Society for Mechanical Engineers (ASME) and American National Standards Institute (ANSI) standard requirements.

In the early 1980's the International Atomic Energy Agency issued IAEA 50-C-QA "*Code on the Safety of Nuclear Power Plants: Quality Assurance*" and SGN revised their SGN QA Manual to also be in compliance with these requirements. In 1987, ISO (International Organization of Standardization) issued standards for QA: ISO 9001, ISO 9002 etc. and then certifications to these standards became a rule in the European industry, in particular in the nuclear field. SGN decided to obtain an ISO 9001, "*Quality Systems - Model for Quality Assurance in Design, Development, Production, Installation and Servicing*," certification and revised its quality system to also meet ISO 9001 requirements. SGN received its first ISO 9001 certification (IQNet Registration No. 1992/847) in December 1992. This certificate has remained in effect through successive re-evaluations and re-certifications since 1992.

As a nuclear engineering company, SGN maintains as the basis of its QA program the 10CFR50 Appendix B requirements that it started with and then modified to meet IAEA 50-C-QA in the 1980's. The SGN QA manual and implementing procedures and operating rules are applied for contracted nuclear engineering work. Where contract requirements warrant, specific procedures are also issued to tailor the SGN QA System to specific requirements of the contract (for example: procedure for identification of documentation and interface procedures with the Client and counterparts).

When the COGEMA MELOX facility design was started, three engineering companies (Belgonucleaire, USSI and Novatome) were responsible for engineering on that project. A project specific QA Program was developed and implemented. This program was used to design, construct, test and operate MELOX until 1994 when USSI merged with SGN and SGN was given the responsibilities of the previous engineering group. Since 1994 the design of MELOX facility expansions and modifications has been controlled by the SGN QA Manual.

COGEMA/SGN QA PROGRAM REGULATORY OVERSIGHT

Similar to the licensing process in the United States, the French government issues the license for all nuclear facilities. After acceptance of the license application by DSIN (Direction de la Sûreté des Installations Nucléaires), the CIINB (Commission Interministérielle des Installations Nucléaires de Base) and the Ministry of Health, the Prime Minister, Minister of Industry and Minister of Environment sign the "decree" giving the applicant the authorization to design and construct a nuclear facility. DSIN, the French Safety Authority, is responsible for providing continuous oversight of the nuclear facility from design to decommissioning. DSIN oversight is wider than the NRC's focus on safety related structures, systems and components (SSCs) and their associated activities. Like the Institute of Nuclear Power Operations (INPO), DSIN performs oversight that is not restricted to safety related SSCs and the application of the QA program but also considers regulatory and technical aspects of all systems over the entire facility.

DSIN representatives regularly inspect SGN activities. These inspections by the Safety Authority are always related to a specific nuclear program attribute as well as any related QA concerns. These inspections are performed in the presence of the licensee; in particular COGEMA.

Design of plant modifications to MELOX and design support of R4 construction at La Hague are also controlled by the SGN QA Manual. Since 1997 DSIN has also performed the following inspections of these activities:

La Hague R4 plutonium plant (presently under construction):

- February 2000 : QA in Design of safety systems,
- November 1999 and December 1998: R4 construction activities.

MELOX plant modifications:

- April and July 1997: civil work of additional buildings,
- October 1997: implementation of nuclear regulation,
- July 1998: construction activities,
- November 1998: electrical equipment qualification,
- November 1998: safety related tests,
- March 1999: interface with main plant in operation, QA files.

EXTERNAL OVERSIGHT

Like U.S. nuclear industry engineering companies SGN is also audited by clients. Recent SGN client audits are:

- ANDRA (French National Nuclear Waste Agency) in 1997 and 1998,
- CEA (French Atomic Energy Commissariat) in 1997, 1998 (nine audits),
- COGEMA in 1997 - 1998 - 1999 (ten audits),
- COVRA (Dutch Nuclear Waste Agency) in 1998,
- EURODIF (Uranium Enrichment Company) in 1998,
- FLUOR DANIEL NORTHWEST (USA) in 1998,
- JRC-ISPRA (Italy) in 1998, and
- CEFRI (French committee for Certifying of Enterprises for the formation of the personnel working under Ionizing Radiation) May 1999.

The French organization for ISO certification, Association Française pour l'Assurance Qualité (AFAQ) also performs audits for SGN to maintain their ISO 9001 certification at its two certified locations.

SGN INTERNAL OVERSIGHT

In accordance with the SGN QA Manual, the SGN Quality Assurance Manager assigns a Quality Delegate to each company division and project. The Quality Delegate provides quality engineering reviews, identifies quality requirements, develops project specific quality plans and procedures, evaluates supplier's QA programs, and has the authority to stop work when QA requirements are not being met. The SGN Quality Delegate assigned to the MFFF Process Design project is also used as the QA point of contact for the DCS QA Manager on QA matters.

The SGN Quality Assurance Manager also directs the SGN QA Department to perform audits of project activities in accordance with SGN QA Procedure MOI 05500 E19 0002, *SGN Internal Quality Audit*. These audits are not restricted to safety related activities but they look at all procedural directed activities.

In addition to the audits from AFAQ, clients, SGN QA Department and DSIN surveillance, SGN management has decided to implement EFQM (European Foundation for Quality Management) self-assessments. These assessments are to improve performance and to compete for Quality Awards. This is equivalent to the Malcolm Baldrige Award in the U.S.

DCS OVERSIGHT

DCS QA Oversight:

The DCS Quality Assurance Manager and the assigned Lead Auditor reviewed the SGN Quality Assurance Manual (Rev. 8) against a DCS developed checklist modeled after the standard NUPIC (Nuclear Procurement Issues Committee) checklist that many U.S. commercial nuclear utilities use to evaluate nuclear supplier QA programs. This review verified that SGN had sufficient QA Program Controls for performing their assigned scope of work on the MOX Fuel Project. Revision 8 of the SGN QA Manual was also evaluated in preparation for audit MFE-99-A01 of the SGN QA Program against a

detailed matrix of NQA-1-1989 requirements. Questions that resulted from this review were highlighted for verification during the scheduled audit. The same detailed matrix will be used for reviewing subsequent revisions to the SGN QA Manual.

DCS Audit MFE-99-A01 was performed from 6-Dec-99 to 10-Dec-99 in Bagnols-Sur-Ceze, France to assess the adequacy and effectiveness of the SGN Quality Assurance Manual (Rev.8) and MOX Fuel Project specific QA Plan to satisfy the applicable criteria of 10CFR50, Appendix B for the scope of work assigned by DCS to the Process Design Group. The audit reported three discrepancies and two observations. The reported deficiencies were: (1) The SGN QA Program did not require documentation of QA Manual and procedure training for quality affecting activities; (2) MELOX drawings were modified into DCS drawings without SGN procedural guidance; and (3) the existing SGN procedure for internal audits did not address actions to be taken when a new project (such as MOX) is initiated. The observations were: (1) the existing SGN procedure that addresses the organization of the US MOX Project did not require documentation of the delegation of responsibilities and (2) temporary storage of MOX Project QA Records is not addressed in the existing SGN procedure for receipt of QA Records. The audit team determined that none of the identified deficiencies or observations has negatively impacted the quality of design related services performed by SGN to date for the Advanced Preliminary Design. Corrective actions were immediately started and the applicable SGN procedures are being appropriately revised to correct the identified deficiencies.

As a result of the detailed review of the SGN QA Manual against NQA-1-1989 requirements and the interviews and reviews associated with DCS Audit MFE-99-A01 performed 6-Dec-99 to 10-Dec-99 in France, DCS QA has established a sufficient baseline of verified information from which to determine that the SGN QA Program coupled with the use of selected DCS engineering procedures is acceptable for use under the controls of the DCS MPQAP. Implementation of SGN's use of their QA Program and applicable DCS engineering procedures shall be periodically monitored by DCS QA audits of work activities in France coupled with quality engineering reviews of deliverables and very frequent surveillances in the DCS Charlotte Office of finished Process Design Group design output documents after they are reviewed for compliance and, in the case of Quality Level 1 SSCs, after design verification by the MFFF Facilities Design group.

MOX Fuel Fabrication Facility Engineering Management and Oversight:


The MFFF Facilities Design Group, located in the DCS Charlotte Office, has assigned an engineer to the SGN offices in Bagnols-Sur-Ceze, France as a liaison for the two groups. This engineer provides technical assistance in integrating the process design with the facilities design. Additionally the MFFF Facilities Design Group provides Engineering Assurance surveillances during process design.

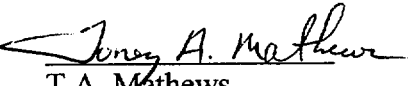
MFFF Engineering has assigned SGN to perform the design of the process systems of the MFFF using a combination of SGN and applicable DCS engineering procedures. An

integrated review of the DCS engineering procedures by both the Facilities and Process Design Groups has resulted in each of the DCS engineering procedures identifying in section 2. SCOPE procedural section applicability for each group. The Process Design Group then produces design output documents in accordance with their procedures and the applicable DCS procedure sections but in the format required by the DCS procedures. SGN performs the reviews required by their program and then submits the design output documents to the Facilities Design Group in accordance with the DCS procedures for final review as applicable.

The Facilities Design group, as part of its "Americanization" process, reviews design output from the Process Design group that affects the Facilities Design. This process is to ensure compliance with U.S. Regulatory codes and standards as well as to ensure proper integration with the design of the facility. Design documents for SSCs that are classified as Quality Level 1 (IROFS- Items Relied on For Safety) also undergo "design verification" typically performed by the Facilities Design Group. Design verification is the process of reviewing, critically examining, testing, confirming, or substantiating the design by one or more methods to provide assurance that the design meets specified design inputs and conforms to other specified requirements. Design verification is performed in accordance with MOX Fuel Project Procedure PP9-3, *Design Control*. All other design documents that could affect the Facilities Design for SSCs classified as Quality Level 2, 3 or 4 (as classified in accordance with DCS procedure PP9-1, *SSC Quality Levels and Marking Design Documents*) are reviewed for compliance with the DCS QA Program and applicable U.S. Regulatory codes and standards. MFFF process system procurement and construction documents are developed, approved and issued by the Facilities Design Group in accordance with the applicable MOX Fuel Project Procedures.

Evidence of SGN nuclear regulated quality experience coupled with the results of the DCS QA review of the SGN QA Manual, audit results by others and of DCS Audit MFE-99-A01, with continuous MFFF Engineering Management and Engineering Assurance oversight and DCS QA quality engineering reviews, audits and surveillances give every indication that the integrated approach taken by DCS in designing the process systems for the MFFF will result in an efficient, safe nuclear facility.

 12 May 2000
R.J. Brackett Date
DCS QA Manager

 12 May 2000
T.A. Mathews Date
Executive VP & Chief
Operating Officer