



# Mixed Oxide Xchange

## Status of the CAR Technical Review



The NRC staff is proceeding with its technical review of the Construction Authorization Request (CAR), and still expects to issue its draft Environmental Impact Statement (EIS) by February

28, 2002, followed by its draft Safety Evaluation Report (SER) on the CAR by April 30, 2002. The staff has determined that a second request for additional information (RAI) on the CAR will not be needed. In most areas of the technical review, the staff has no significant outstanding issues. However, in some areas, additional clarifications and information are still needed to complete the review. The staff believes that these clarifications and the additional information can be more effectively and efficiently obtained through public meetings, in-office reviews at Duke Cogema Stone & Webster (DCS) offices in Charlotte, North Carolina, and phone calls. Areas where additional clarifications or information is needed include:

1. Chemical safety.
2. Criticality safety.
3. HEPA filter efficiency.
4. Facility worker safety.
5. Fire protection.
6. Instrumentation and control (I&C).

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## TECHNICAL REVIEW OF MOX QA PROGRAM COMPLETED

On October 1, 2001 the NRC staff completed its technical review of the DCS MOX Project Quality Assurance Plan (MPQAP) and approved it for construction activities, including design, procurement, and fabrication. The NRC staff concluded that the MPQAP with additional commitments submitted by DCS (1) adequately described its QA program for construction activities, (2) meets the requirements specified in the regulations in 10 CFR 70.23(b) and, (3) will provide reasonable assurance of protection against natural phenomena and the consequences of potential accidents.

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## Late Breaking News

**The Atomic Safety Licensing Board Panel (ASLBP) has issued its ruling on standing and admissibility of contentions in regards to intervention petitions submitted by several Petitioners. The ASLBP Memorandum and Order dated December 6, 2001, can be found in ADAMS at accession number ML0134100850. Also see the article on page 2 regarding the pre-hearing conference in North Augusta, South Carolina, on September 21, 2001.**

## Waste Management at the MFFF

If the proposed Mixed Oxide Fuel Fabrication Facility (MFFF) is built and operated, it will generate various types of waste, all of which must be anticipated and managed in accordance with local, state and federal laws. The purpose of this article is to provide a short summary of the major types of waste DCS has described in its CAR and Environmental Report, and how each waste category would be managed.

The manufacture of mixed oxide fuel assemblies from plutonium oxide powder would require many process steps involving chemical and physical changes to the uranium and plutonium oxides. Wastes would be generated by each of these steps and the form of the wastes -- either gas, liquid or solid -- would depend upon what happens during each step.



Gaseous wastes would be treated so that the contamination is reduced to acceptable levels before being released through the facility stack to the atmosphere. Such waste would be generated mostly in the facility's gloveboxes and  
(Continued on page 4 - see WASTE)

## TRANSPORTATION

### of Mixed Oxide Fuel

In the U. S. Department of Energy's (DOE's) "Surplus Plutonium Disposition Final Environmental Impact Statement," DOE evaluated impacts of shipping weapons-grade plutonium and mixed oxide fuel. Shipments of weapons-grade plutonium and fresh mixed oxide fuel would be made by DOE using its Safe Secure Trailer/Safeguards Transport (SST/SGT) system. While details of this transportation system are classified, some of the system's more general features may be discussed. Each SST/SGT unit includes enhanced structural supports, enhanced protection against fire damage, armed couriers, an armored tractor to protect the shipping crew, advanced communications systems, and real-time monitoring of the vehicle's location and status.

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## NRC Judges Hold Pre-Hearing Conference in CAR Legal Proceeding

On September 21, 2001, in North Augusta, South Carolina, a three-judge panel established by the Chief Administrative Judge of the NRC's Atomic Safety and Licensing Board Panel heard oral arguments on whether to admit contentions submitted by hearing petitioners Georgians Against Nuclear Energy (GANE); Blue Ridge Environmental Defense League (BREDL); Donald Moniak; and Environmentalists Inc. (EI). Some of the several contentions discussed related to security issues, seismic issues, and the controlled area boundary at the site of the proposed MFFF. GANE, BREDL, Mr. Moniak, and EI had earlier filed requests for hearing on whether the NRC should approve the CAR submitted by DCS in February 2001. The judges are expected to issue a decision in December 2001 granting or denying each of these pending hearing requests.

At the pre-hearing conference, the three-judge panel also heard oral arguments on whether GANE, BREDL, Mr. Moniak, and EI had established their standing to contest the CAR, and on GANE's motion to dismiss the proceeding or hold it in abeyance. ❄️ ❄️

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On October 11, 2001, the staff held technical discussions with DCS in a public meeting. On October 16-18, 2001 and November 27-29, 2001, the staff reviewed CAR supporting information at DCS offices in Charlotte. Both the meeting and the in-office reviews proved to be an effective and efficient means to obtain information needed by the staff in furtherance of its technical review. The staff plans to use similar methods as its review of the CAR continues.

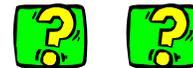
As a result of the October 11 meeting and the in-office reviews, DCS committed to provide additional information requested by the staff. Publicly-available summaries of the October 11 meeting and the in-office reviews will describe the additional information requested by the staff. The staff continues to be mindful of the need to ensure that the review process is transparent to the public and that the basis for its decisions is fully documented. • •

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The review was documented in a safety evaluation report (SER), and followed the procedures stated in NUREG-1718, "Standard Review Plan (SRP) for the Review of an Application for a Mixed Oxide (MOX) Fuel Fabrication Facility," dated August 2000. The SER identified the QA criteria required for the MOX QA program, the DCS commitments and the staff conclusions. The NRC staff verified that MPQAP and DCS commitments adequately described how the 18 QA program areas (criteria) will be implemented, and included definition of the process, methods, and criteria for identifying the functional requirements and grading of QA controls for structures, systems and components.



## Questions and Answers



**Q:** Who are members of the Duke Cogema Stone & Webster (DCS) consortium?

**A:** Duke Engineering & Services, Inc. (DE&S) is a world-wide nuclear engineering, licensing, and environmental services company. DE&S works on developing advanced reactor designs, and the related issues of spent fuel management, environmental remediation, decontamination, and decommissioning. DE&S is an affiliate of Duke Energy Corporation.

COGEMA Inc. is a French company that has offered nuclear fuel services to the U.S. nuclear community since 1982. The COGEMA group provides products, services, and engineering in uranium mining, conversion and enrichment, uranium and mixed oxide fuel fabrication, spent fuel management, nuclear waste storage, transportation, and site remediation.

Stone & Webster designs plutonium processing, packaging, and storage facilities and is currently engaged in several plutonium-related facility projects across the U.S. It is also a major supplier of architectural and engineering services for nuclear power plants.

(WASTE - continued from page 2)

process vessels. The equipment that DCS proposes to use to mitigate potentially radioactive emissions to the atmosphere include scrubbing columns, demisters, and high efficiency particulate air (HEPA) filters.

Most of the liquid wastes would be produced in the process step in which the plutonium oxide powder is dissolved in acid and then purified using a solvent extraction process. This dissolution step would involve adding a compound of silver (Ag) to the acid used to dissolve plutonium oxide. Once dissolved, the plutonium would be separated from gallium, a major component of the plutonium alloy used in weapons, and residual amounts of uranium, americium, and other impurities in a solvent extraction process. To minimize the amount of wastes produced, and to reduce the additional costs of constantly replacing materials and managing excessive wastes, DCS proposes to recycle as much of the acid, silver, and solvent as possible. However, the remaining major waste categories which must still be managed include the silver recovery wastes, the highly radioactive impurities removed from the plutonium oxide (referred to as the high alpha activity waste stream), the acid recovery wastes, solvent regeneration wastes, and stripped uranium stream. DCS proposes to transfer all of this liquid radioactive waste to the appropriate Savannah River Site (SRS) facilities in accordance with the Waste Acceptance Criteria defined by those facilities.

Other liquid wastes would include rinse water, water from contaminated drains, and nonhazardous liquid wastes generated throughout the plant. DCS proposes to transfer these wastes to either the SRS Effluent Treatment Facility or the SRS F-area sanitary sewer system that

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ASLBP	Atomic Safety Licensing Board Panel
BREDL	Blue Ridge Environmental Defense League
CAR	Construction Authorization Request
CFR	Code of Federal Regulations
DCS	Duke Cogema Stone & Webster
DES	Duke Engineering & Services, Inc.
DOE	U.S. Department of Energy
EI	Environmentalists Inc.
EIS	Environmental Impact Statement
GANE	Georgians Against Nuclear Energy
HEPA	High Efficiency Particulate Air (filter)
I&C	Instrumentation and Control
LLW	Low Level Waste
MFFF	Mixed Oxide Fuel Fabrication Facility
MOX	Mixed Oxide
MPQAP	MOX Project Quality Assurance Plan
NRC	U.S. Nuclear Regulatory Commission
QA	Quality Assurance
RAI	Request for Additional Information
SER	Safety Evaluation Report
SGT	Safeguards Transport
SRP	Standard Review Plan
SRS	Savannah River Site
SST	Safe Secure Trailer
TRU	Transuranic

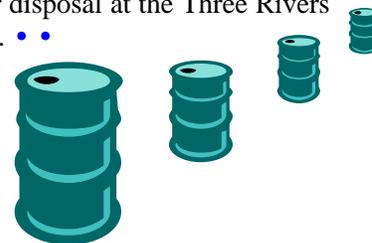
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Shipments of fresh mixed oxide fuel going to the user reactor sites -- in addition to being carried in DOE's SST/SGT system -- will be contained within NRC-approved transport packages which meet the requirements of 10 CFR Part 71. DCS has contracted with Packaging Technology to design and build the fresh fuel packages. As currently planned, each package would have the capacity to contain three fresh fuel assemblies, and would be designed to meet various transport accident test conditions such as a 30-ft drop, and exposure to a 30-minute fuel fire. In late 2002, Packaging Technology plans to submit to NRC an application for package certification, pursuant to 10 CFR Part 71 requirements. • •

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connects to the SRS's Central Sanitary Waste Treatment Facility, as appropriate. Solid wastes from the proposed MFFF would include transuranic (TRU) radioactive wastes, mixed TRU wastes, low-level radioactive wastes (LLW), mixed LLW, chemically hazardous solid waste, and nonhazardous solid waste. In general, at the MFFF, TRU wastes would contain concentrations of more than 100 nanocuries per gram of long-lived alpha-emitting radionuclides heavier than uranium. Low-level wastes would be those radioactive wastes that do not fit the definition of TRU wastes. Mixed wastes (both mixed TRU and mixed LLW) contain a chemically hazardous substance in addition to being radioactive. Lead-lined gloves for some gloveboxes are the only mixed TRU waste so far identified by DCS, and DCS has stated that it may take steps to avoid generating this waste type. One source of mixed LLW would be solidified spent solvent wastes containing plutonium.

The methods by which DCS proposes to handle solid wastes varies with the type of waste. For example, TRU wastes would be packaged and stored in the MFFF or another SRS facility before being transferred to the Waste Isolation Pilot Plant in New Mexico. Solid LLW and mixed LLW that can be reduced in volume by incineration would be disposed of at SRS, a commercial facility, or another DOE facility. Nonincinerable mixed LLW would be reduced in volume by other methods before disposal at a commercial or DOE facility. Nonincinerable LLW would also be volume reduced by other means before disposal at SRS or a commercial facility. Hazardous wastes would be properly packaged and stored until they are transferred to the SRS or a commercial facility. Finally, nonhazardous solid waste would be recycled or sent for disposal at the Three Rivers Landfill at the SRS. • •



## Please Note...

The NRC has launched a redesigned Web site at [www.nrc.gov](http://www.nrc.gov). However, the Mixed Oxide Fuel Infoweb is undergoing an evaluation and is unavailable at this time due to the situation created by the September 11th terrorist attack. We hope to have it reinstated in the near future and will advise you of the status in the next newsletter.





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