



An NRC quarterly newsletter providing licensing information on a Mixed Oxide Fuel Fabrication Facility

# Mixed Oxide Xchange

U. S. Nuclear Regulatory Commission

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## NRC HOLDS PUBLIC SCOPING MEETINGS

On March 7, 2001, the U.S. Nuclear Regulatory Commission (NRC) published a Notice of Intent (NOI) to prepare an Environmental Impact Statement (EIS) for the proposed MOX facility. An EIS is a planning and decision-making tool that evaluates potential impacts from a proposed project and alternatives to the proposed project. The NOI, which was published in the *Federal Register* (66 FR 13794), started the scoping phase of the EIS process. Public scoping meetings are held to gather information from the public and stakeholders on significant issues that should be considered in preparing the EIS.

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## Four Requests for Hearings Received

The period to request a hearing on the proposed MOX Fuel Fabrication Facility construction application ended on May 18, 2001. The NRC received four requests for hearings

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## Receipt of the Mixed Oxide Fuel Fabrication Facility Construction Authorization Request at NRC

(Beginning at left, NRC staff: Andrew Persinko, Joseph Giitter, Timothy Harris, and Amy Hoadley.)

## MOX APPLICATION ARRIVES AT NRC

Duke Cogema Stone & Webster (DCS) filed its Construction Authorization Request (CAR)—the first part of a two-part licensing application—on February 28, 2001. Next summer DCS plans to file the second part of its application -- asking the NRC to authorize operation of the MOX facility.

Additional documents supporting the application were filed by DCS in December 2000 (the DCS Environmental Report and a DCS report, "Choice of MFFF Process Glovebox Window Material") and January 2001 (a revised Quality Assurance Plan). General information on these items as well as documentation of the NRC review and proposed schedules can be found on the agency's MOX website at [www.nrc.gov/NRC/NMSS/MOX/index.html](http://www.nrc.gov/NRC/NMSS/MOX/index.html). This same information in a searchable format may be obtained from the agency's ADAMS document storage and retrieval system. The MOX CAR (non-proprietary version) is located in ADAMS under accession number [ML010650204](#).



## MOX LICENSING PROCESS

### MOX Fuel Fabrication

On February 28, 2001, DCS— acting as a contractor of the U.S. Department of Energy (DOE)— filed a Construction Authorization Request (CAR), asking the NRC to authorize DCS to build a MOX fuel fabrication facility. The NRC expects to make its decision on whether to approve the CAR by October 2002.

Next summer, before this decision is made, DCS plans to file a request asking the NRC to authorize *operation* of the MOX facility. NRC's review of this request is expected to last two years. If the NRC decides not to approve the CAR in October 2002, further consideration of the DCS request for operating authority would be suspended. If the NRC approves the CAR, construction could then begin. During construction of the facility the NRC will make sure that the MOX facility is properly constructed. Only then, if this and all other 10 CFR Part 70 requirements have been met, would DCS be authorized to operate the MOX facility. In this event, DCS would become an NRC licensee.

### MOX Use in Reactors

In parallel with the licensing process for the MOX facility, Duke Power is expected to file requests to burn MOX fuel in the McGuire and Catawba plants. Duke Power's existing licenses must be amended before MOX fuel may be used. The first application, scheduled for submittal sometime after August 2001, will request NRC approval to place "lead test assemblies" in one of the four reactors. These initial MOX assemblies will be used to confirm the expected performance of MOX fuel in the reactors. DCS has not yet identified who will manufacture the lead test assemblies. If the NRC approves placement of the lead test assemblies in a reactor, Duke Power's current plans are to submit in 2004 an application to use MOX fuel in up to approximately 40 percent of the core at each of the reactors at Catawba and McGuire.

After Duke Power files the requests for license amendments, interested members of the public will have the opportunity to request that the NRC hold hearings on the license amendment applications. ❖❖

## What is an Acceptance Review?



When any initial application for a license or similar approval is filed with the NRC, an acceptance review of the filing is conducted (typically taking 30 days) to determine whether the filing contains the information that the NRC requires. If the filing passes the acceptance review, then the NRC begins a detailed technical review of the filing. This process was followed for the CAR, and on March 28, 2001, the NRC sent a letter to DCS stating that the CAR had passed the acceptance review and contained sufficient information for the staff to begin a detailed technical review. The March 28 letter noted that, for some areas of the CAR, additional information will be necessary. The March 28 letter further stated that during the course of the detailed technical review, other areas may be identified where additional information is necessary. Issuance of the March 28 letter does not mean that the NRC has approved the construction or operation of the proposed MOX fuel fabrication facility, and does not mean that the proposed facility will ultimately be found to be acceptable. ❖❖

SCOPING MTGS (continued from page 1)

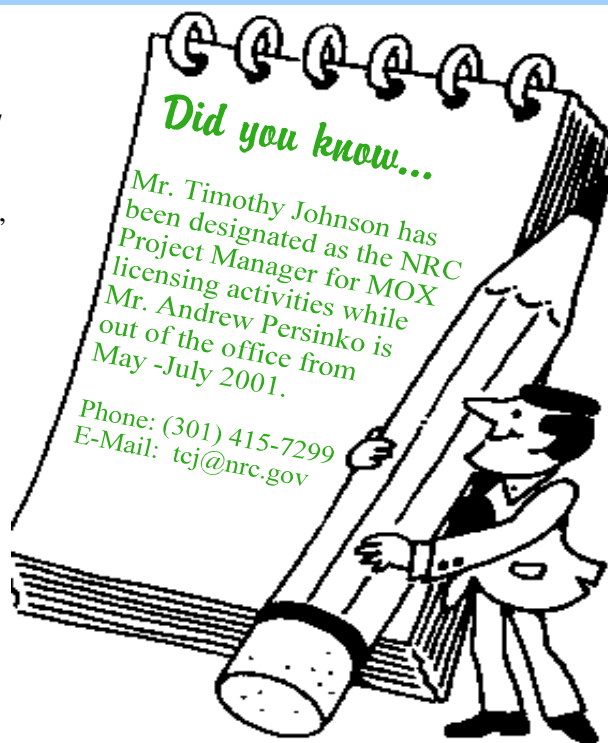
NRC held three planned scoping meetings on April 17 in North Augusta, South Carolina, on April 18 in Savannah, Georgia, and on May 8, 2001, in Charlotte, North Carolina. An informal, "open house" information exchange was held before each meeting.

The North Augusta meeting was attended by approximately 100 people including elected representatives from South Carolina and Georgia, local government officials, residents, and those representing environmental organizations.

The Savannah meeting was attended by approximately 50 people, and the Charlotte meeting was attended by approximately 120 people. NRC staff made presentations on NRC's role in the proposed project and the EIS process. We received detailed scoping comments on a wide variety of issues including environmental justice, socio-economic impacts, reactor use considerations, waste management, groundwater, decommissioning, human health, and transportation. In addition, issues relative to how responsibilities of the Department of Energy differ from those of the NRC were raised. We also received comments on alternatives that should be considered. These included considering impacts from immobilization of all the surplus plutonium in context of the no action alternative, and consideration of impacts from associated actions such as the Russian surplus plutonium disposition program. The scoping meetings were transcribed, and a copy of the transcripts are available on the NRC MOX InfoWeb and in ADAMS.

In addition to accepting comments at the public scoping meetings, the NRC also accepted written comments on the scoping process until May 21, 2001. Written comments were to have been addressed to Mike Lesar, Chief, Rules and Directives Branch, Division of Administrative Services, Office of Administration, Mail Stop T-6D59, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555. Interested parties were also encouraged to e-mail comments to [teh@nrc.gov](mailto:teh@nrc.gov), or fax them to (301) 415-5398, Attention: Tim Harris. Scoping comments received after May 21 will be considered to the extent practical, but may not be included in the Scoping Summary Report.

NRC plans to issue the Scoping Summary Report in July 2001. This report will summarize the comments and issues raised, discuss alternatives to be evaluated, present a preliminary schedule for preparing the EIS, and provide an outline of the draft EIS. A copy of the Scoping Summary Report will be mailed to participants who provided comments or attended the scoping meetings. A copy will also be posted on the NRC MOX InfoWeb. ❖❖



**YOU WILL FIND NRC'S MOX WEBSITE AT:  
[www.nrc.gov/NRC/NMSS/MOX/index.html](http://www.nrc.gov/NRC/NMSS/MOX/index.html)**

## Hearing Procedures

In a letter dated March 20, 2001, NRC Chairman Meserve responded to Mr. Brett Bursey, Director of the South Carolina Progressive Network, regarding the type of hearing procedures that will be used for licensing the MOX facility. In his letter, Chairman Meserve explained that procedures set forth in Title 10 of the Code of Federal Regulations, Part 2, Subpart L are “generally applicable to the adjudication of matters related to the issuance of 10 CFR Part 70 licenses.” The Chairman’s response continues that while any hearing on the proposed MOX facility would thus be a Subpart L hearing, the Commission has decided to require the filing of contentions, and provide for limited discovery with the option for later oral questioning of expert witnesses by the Presiding Officer.

More details in this regard are provided in the Notice of Opportunity for Hearing that was published in the *Federal Register* on April 18, 2001 (66 FR 19994). The deadline for submitting requests for a hearing was May 18, 2001. ❖❖

## Meeting Summaries

Listed below are abbreviated summaries of past meetings with NRC staff regarding MOX since the last newsletter was issue on March 1, 2001. All meetings, except those dealing with safeguards and security matters, were open to the public. For complete summaries, please visit the MOX website at <http://www.nrc.gov/NRC/NMSS/MOX/index.html>.

**March 21, 2001** - Representatives of Packaging Technology, Inc. and the NRC discussed the design of a new package for the transport of fresh fuel assemblies that contain mixed oxide fuel.

**April 17-18, 2001** - The NRC participated in public scoping meetings that allowed members of the public to express their opinion and provide information and comments that assist the agency in its environmental evaluation of the proposed MFFF near Aiken, South Carolina. The meetings were held in North Augusta, South Carolina, and in Savannah, Georgia.

**April 25, 2001** - DCS and NRC discussed project status, project schedules, and technical information related to the construction authorization application for the MOX fuel fabrication facility.

**May 8, 2001** - The NRC participated in another public scoping meeting associated with the preparation of the Environmental Impact Statement for the proposed MFFF near Aiken, South Carolina. The meeting was held in Charlotte, North Carolina. ❖❖



### HEARINGS (Continued from page 1)

from the following three groups and one individual: The Blue Ridge Environmental Defense League; Environmentalists, Inc.; Georgians Against Nuclear Energy; and Ms. Edna Foster. Please refer to the NRC’s ADAMS system or the MOX website (see “Environmental Review”) for more information on these requests. ❖❖



## Plutonium Properties & Protection Measures

In our first issue of *Mixed Oxide Xchange*, we provided a brief overview of surplus plutonium and its origin. The purpose of this article is to present a brief overview of the properties of plutonium (using common everyday terms) and to describe the basic measures that are used to protect people and the environment from its hazards.

**Plutonium is radioactive.** In just 1 gram of surplus plutonium, which is about the weight of a paper clip, billions of atoms release some of their stored energy in the form of radiation every second. The ability to release stored energy makes surplus plutonium radioactive, but it is also what makes surplus plutonium useful.

The bulk of the radiation released by plutonium is alpha radiation. Alpha radiation cannot penetrate matter very deeply. A piece of paper or even the outer layer of skin will stop it. But, if plutonium is inhaled or finds another way into the human body the alpha radiation can strike and damage living tissue. This is why confinement is such an important design feature in the proposed MOX facility and why the NRC will ensure that there are many layers of confinement. For example, in some areas DCS proposes that the plutonium will be stored inside

closed containers inside sealed gloveboxes, which, in turn, will be inside closed rooms of buildings with high-performance ventilation systems that filter and remove plutonium to keep it from reaching the environment or other work spaces.

Another matter that must be considered is that when alpha radiation is absorbed by the wrong material, it can be transformed to much more penetrating gamma or neutron radiation. The NRC will ensure that the surplus plutonium is handled and stored safely to prevent contact or mixture with these materials.

The natural radioactive decay process changes the surplus plutonium. New materials, such as americium-241, are constantly emerging. While americium-241 releases alpha radiation like plutonium, it also releases x-ray radiation. X-ray radiation requires controls to protect workers, such as shielding and limits placed on the amount of time spent in areas where it is present. Also, since the americium-241 generated by the MOX fuel manufacturing process is waste, the NRC will ensure that it can be stored and disposed of safely.

**Plutonium and radiation dose.** How many grams of surplus plutonium oxide would a worker have to inhale to receive the NRC's

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*PLUTONIUM* (continued from page 5)

radiation dose limit for workers of 5 rem per year (as required in 10 CFR Part 20)? The answer is about 1/10,000,000th of a gram. This is a very small amount. Remember the paper clip example above? This is why it is very important for the NRC to ensure that, if the MOX facility is licensed to operate, the plutonium is confined in such a way that it cannot reach people and the environment.

**Plutonium is fissile.** Plutonium atoms can split or fission. This reaction releases much more radiation energy than the process of radioactive decay described above. This reaction is the reason that plutonium is both exploited in nuclear weapons and useful as nuclear fuel for power reactors. If plutonium is not handled properly, the danger exists that it could begin to rapidly and uncontrollably fission. Because the intense radiation from an uncontrolled fission process could be lethal to anyone standing

nearby, the NRC will require stringent controls to prevent a fission accident. For example, DCS will be required to use tanks and piping designed specifically to prevent a fission accident from occurring.

**Plutonium is reactive.** The chemistry of both solid and liquid plutonium compounds is complex. However, the chemical processes involved in the proposed MOX facility are well understood and have been used safely for many years. These processes include dissolving the plutonium dioxide, removing impurities while it is in the liquid form, and then re-forming the plutonium dioxide for fabrication into fuel pellets. Other chemical forms involved in the process include plutonium nitrate and plutonium oxalate, which have been used for over fifty years. The NRC will ensure that DCS takes industry experience with this process into consideration in designing a MOX facility that is safe for workers and the public. ❖❖

## U.S. Nuclear Regulatory Commission

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*Mixed Oxide Xchange* is published quarterly to highlight recent news and events associated with the NRC's licensing of a mixed oxide fuel fabrication facility. We welcome your suggestions for improvement of this newsletter. If you have comments or suggestions, you may contact us at [moxfedback@nrc.gov](mailto:moxfedback@nrc.gov). To subscribe or unsubscribe, please send an e-mail to [subscribe@nrc.gov](mailto:subscribe@nrc.gov). All issues will be e-mailed unless you provide your mailing address and indicate your preference to receive copies by U.S. Postal Service.