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

Mixed Oxide Xchange

U. S. Nuclear Regulatory Commission NUREG/BR-0284 March 2001

Vol. 1, No. 1

NRC INTRODUCES *MIXED OXIDE XCHANGE*

The U.S. Nuclear Regulatory Commission (NRC) introduces *Mixed Oxide Xchange*—a quarterly newsletter on the licensing of a mixed oxide (MOX) nuclear fuel fabrication facility.

Each quarter, the *Mixed Oxide Xchange* will contain news and information articles, meeting notices and summaries, answers to frequently asked questions, and more! We hope these features will keep you informed about the MOX licensing process and that you will provide feedback to us. Since this newsletter is so new, we really want your feedback on the whole idea, so that we can give you what you need. Please comment on any aspect of the newsletter - including its style, content and coverage. Through *Mixed Oxide Xchange* and the other NRC public information tools, such as public meetings, press releases, and the NRC MOX InfoWeb, the NRC wishes to keep the public informed to ensure that their issues and concerns are considered.

We welcome your comments on the *Mixed Oxide Xchange* and will use these comments to evaluate the continued issuance of this newsletter. Please send your thoughts to moxfeedback@nrc.gov. We look forward to hearing from you! ❂❂

DOE VS. NRC: WHO'S WHO?

With the end of the Cold War, the United States and Russia entered into bilateral agreements in which each country agreed to dispose of surplus weapons-grade plutonium, much of which came from disassembled nuclear weapons. It is the U.S. Department of Energy's (DOE) responsibility to dispose of the surplus weapons material in the U.S. One strategy DOE has developed is to use the plutonium in the fuel for a power reactor in a once-through process so that the accessibility and attractiveness for retrieval and future use in weapons is significantly reduced. To pursue this strategy, DOE has contracted with Duke Cogema Stone & Webster (DCS) to convert approximately 25 metric tons of surplus weapons-grade plutonium into mixed oxide (MOX) fuel. The MOX fuel, in turn, is proposed for use in the Catawba and McGuire commercial nuclear power plants. Only plutonium from dismantled U.S. weapons will be used in the MOX fuel that is to be used at Catawba and McGuire.

The facility to fabricate the U.S. MOX fuel is proposed to be designed, constructed and operated by DCS and owned by the U.S. Government. Current plans are to locate the facility at the DOE's Savannah River Site in South Carolina, but the facility will be subject to

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NRC's Mixed Oxide Fuel Infoweb

You will find NRC's MOX website at www.nrc.gov/NRC/NMSS/MOX/index.html. The website gives background on nuclear fuel, history, licensing and environmental information, meetings, updates related to MOX and power reactors, and frequently asked questions. Your input is always appreciated.

For Your Info . . .

Mr. Andrew Persinko
is the NRC Project Manager
for the MOX licensing
activities.

Phone: (301) 415-6522
E-Mail: axp1@nrc.gov

Mr. Persinko will be out of
the office during the Spring of
2001. In his absence, the
NRC Backup Project Manager
is Mr. Timothy Johnson.

Phone: (301) 415-7299
E-Mail: tcj@nrc.gov

Surplus Plutonium - An Overview

Plutonium in its pure form is a very dense metal with a dull silver color. It is an element with unique physical and nuclear properties. For example, in its pure form it is roughly two and a half times more dense than lead and atoms of plutonium will split when bombarded with neutrons. The splitting, or fission, of plutonium atoms releases a lot of energy. In fact, fissioning two pounds of plutonium provides the same amount of energy as 3,800 tons of coal.

Following its discovery in 1941 by Dr. Glenn Seaborg and others at the University of California at Berkeley, the U. S. began producing many tons of plutonium for use in nuclear weapons. Plutonium was produced by bombarding uranium with neutrons in government-owned nuclear reactors. By 1994, the U. S. had produced 111.4 metric tons of plutonium, and 99.5 metric tons remained in inventory. The remainder was used in wartime, weapons tests or were disposed of as wastes.

As of September 2000, as much as 34 metric tons of weapons plutonium had been declared surplus to the U.S. nuclear weapons program. The U.S. Department of Energy proposes to immobilize 9 metric tons of this surplus as solid high-level nuclear waste and convert the remaining 25 metric tons to MOX fuel.

MOX and the Environment

On December 19, 2000, as one of the first steps in the NRC EIS process, the NRC received the "Mixed Oxide Fuel Fabrication Facility Environmental Report" from Duke Cogema Stone & Webster. The Environmental Report was submitted in accordance with 10 CFR Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions." The report is now available at the NRC's MOX InfoWeb.

The NRC will prepare an Environmental Impact Statement for the MOX license application. An Environmental Impact Statement, or EIS, is a detailed report that describes the environmental impact of a proposed action. It includes, for example, a discussion of adverse environmental effects that cannot be avoided and alternatives to the proposed action.

Public scoping meetings, tentatively planned for April 2001, are the next important step in the EIS process. The dates, times, and locations of these meetings will be announced in the *Federal Register* and on the NRC's MOX InfoWeb.

These scoping meetings will be held to solicit public input. Input received from the public helps the NRC define issues and alternatives that should be examined more thoroughly and possibly addressed in the draft EIS. At present, the NRC expects to issue a final EIS in September 2002.

Responsibilities (continued from page 1)
U.S. Nuclear Regulatory Commission (NRC) licensing requirements and oversight. Since the purpose of the facility is to disposition surplus U.S. plutonium, the facility will be shut-down when the disposition mission is complete.

Once the MOX fuel is manufactured, it would then be used as fuel in commercial power reactors. Such use is subject to separate NRC licensing requirements. There would be no reprocessing or subsequent reuse of this spent fuel. Using the plutonium in the reactor as MOX fuel makes the plutonium unattractive and inaccessible for use in weapons.

The mission of the NRC in this process is to ensure adequate protection of the public health and safety, the common defense and security, and the environment in the use of nuclear materials in the United States. The Defense Authorization Act for Fiscal Year 1999 provided the NRC with the regulatory and licensing authority over the construction and operation of the MOX fuel fabrication facility. The NRC also regulates the commercial reactors that would use the MOX fuel. If the NRC receives an application for a MOX facility, it is the agency's responsibility to verify that an applicant will be in compliance with NRC's regulations. If the review concludes that the applicant meets the requirements of the regulations, the NRC will issue a license. If the review shows that the applicant does not meet the requirements, the NRC will not issue a license. If the MOX fuel fabrication facility is built, the NRC will perform inspections during construction and operation. The NRC will also review any requests to use MOX fuel in nuclear power plants and must amend the operating reactor's license, before MOX fuel can be used in the reactor.

For more information you can go to DOE's web site at http://www.doe-md.com/. ❁❁

UPCOMING MEETING

MOX EIS Scoping Meeting

The NRC is planning to hold scoping meetings in April 2001 as it develops the MOX Environmental Impact Statement. Look for locations, dates, and times of these meetings on the NRC MOX infoweb at http://www.nrc.gov/NRC/NMSS/MOX/index.html.

Meeting Summaries

Listed below are abbreviated summaries of past meetings with NRC staff regarding MOX. 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.

1999

August 31, 1999 - NRC staff met with DCS and DOE to discuss design and licensing aspects of a MOX fuel fabrication facility.

September 20-24, 1999 - NRC visited the *Direction de la Surete des Installations Nucleaires* (DSIN- a French nuclear regulatory agency) and Cogema to discuss technical aspects of MOX fuel processing. Discussion topics included operating history, nuclear criticality safety, fire protection, natural phenomena, confinement ventilation, electrical safety, and the "American-ization" of the French MOX designs for use in the U.S. MOX facility.

November 16-17, 1999 - DCS and NRC discussed technical topics associated with the MOX fuel fabrication facility. Topics included design bases, quality assurance program, classification and level, process description overview, integrated safety analysis, natural phenomena hazards, and nuclear criticality safety.

December 7, 1999 - Representatives of Packaging Technology, Inc. and the NRC discussed licensing plans and preliminary design information for the MOX fresh fuel package.

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December 10, 1999 - Representatives from DCS met with NRC to discuss technical topics associated with the MOX fuel fabrication facility. Topics included material control and accounting, International Atomic Energy Agency requirements, classification of information, and physical security.

2000

February 3, 2000 - NRC staff met with DCS to discuss technical topics associated with the MOX fuel fabrication plant. Topics included worker dose, heating ventilation and air conditioning, polycarbonate material in glove box windows, fire protection, and controlled area boundary.

May 9, 2000 - NRC held a public meeting to discuss comments and resolutions to those comments received on the draft NUREG-1718, "Standard Review Plan for a Mixed Oxide Fuel Fabrication Facility."

July 12-13, 2000 - NRC conducted public meetings in Columbia and North Augusta, South Carolina. The meetings informed the public about NRC's role in licensing the proposed MOX fuel fabrication facility that DOE plans to locate at the Savannah River Site near Aiken, South Carolina.

July 17, 2000 - NRC staff met with DCS to discuss mechanisms for ensuring consistent control of Unclassified Controlled Nuclear Information.

August 2, 2000 - NRC met with DCS to discuss seismic and quality assurance issues applicable to the MOX fuel fabrication facility.

August 16-18, 2000 - NRC staff met with DCS in Charlotte, NC to review MOX Project Quality Assurance Plan implementation in the licensing process.

September 19-20, 2000 - NRC visited the French spent nuclear fuel reprocessing plant at La Hague and the MOX fuel fabrication operations at Marcoule. These facilities are expected to be similar to the designs for a MOX fuel fabrication facility to be located at the Savannah River Site

October 4, 2000 - NRC staff met with Packaging Technology, Inc. to discuss technical issues related to the MOX fresh fuel transportation package for power reactors.

October 12, 2000 - NRC staff met with DCS to discuss MOX fuel qualification for use in power reactors.

October 16-20, 2000 - NRC visited the Cogema SGN offices and the MELOX plant to review MOX Project Quality Assurance Plan implementation in the licensing process.

2001

January 4-5, 2001 - NRC met with DCS to discuss the project status and schedules, format of the construction authorization application, and design basis information to be included in the construction authorization application for the MOX fuel fabrication facility.

February 2, 2001 - NRC staff briefed the Advisory Committee on Reactor Safeguards on the proposed MOX fuel fabrication facility. (The meeting transcript is available at http://www.nrc.gov/ACRSACNW.

ALPHABET SOUP

≪Commonly Used Acronyms in this Newsletter≫

DCS	Duke Cogema Stone & Webster
DOE	U.S. Department of Energy
EIS	Environmental Impact Statement
MOX	Mixed Oxide (uranium-plutonium fuel for nuclear reactors)
NRC	U.S. Nuclear Regulatory Commission

QUESTIONS AND ANSWERS

Q: Isn't the MOX proposal an issue mostly of money and possibly not what is best for the public and environment?

A: This is an issue of national security and nuclear non-proliferation policy. The U.S. Government and the Russian Federation agreed that some of the surplus plutonium from Russian and American weapons programs could be used to produce MOX fuel because after it had been used to generate electricity, it would be unattractive for use in nuclear weapons. Under this agreement, a U.S. MOX facility would only be used to disposition plutonium from the U.S. The NRC's role is to assure the public that it will only license a safe, environmentally responsible facility.

Q: Since the reactors were not designed to use plutonium, how do we know that the modifications will be safe?

A: Although the reactors were not specifically designed to use weapons-grade plutonium, they were designed to use the reactor-grade plutonium that is generated in the uranium fuel during normal operation. There is substantial world-wide experience with the use and behavior of reactor-grade plutonium, because all operating reactors contain plutonium created during the fission process.

Q: Has the NRC ever denied a license?

A: Yes. For example, the NRC recently denied a license for a portable irradiator based on safety concerns. In other instances, license applications have been withdrawn, or there have been delays in approving license applications while the applicant made changes to the facility or required programs in order to comply with NRC requirements. Approvals have often followed years of construction changes made necessary to comply with regulatory requirements and the findings of quality assurance examinations. Neither the NRC nor its predecessor, the Atomic Energy Commission (AEC), has ever denied an application for an operating power reactor license, largely because the facility was in compliance with NRC regulations after the changes were made and before approval.

U.S. Nuclear Regulatory Commission

Mailing Address
Office of Nuclear Material Safety and Safeguards
Division of Fuel Cycle Safety and Safeguards
Attn: Mr. David D. Brown, CHP
Mail Stop T-8A33
Washington, D.C. 20555

Public Document Room
11555 Rockville Pike
Room #O-1F21
Rockville, Maryland 20852
Toll Free Telephone: 1- 800- 397- 4209

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 newletter. If you have comments or suggestions, you may contact us at moxfeedback@nrc.gov. To subscribe or unsubscribe, please send an e-mail to 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.