Friends of the Earth

July 7, 2011

Re: Docket ID NRC-2010-0267, Draft Regulatory Basis for a Potential Rulemaking on Spent Nuclear Fuel Reprocessing Facilities

Please see attached Friends of the Earth issue brief - *Risky Plutonium Fuel (MOX) Proposed for Use in U.S. Reactors, At Taxpayers' Expense* - for consideration concerning status of the U.S. plutonium fuel (MOX) program and how this facility or a similar U.S. MOX plant might be considered or not under regulations developed for a reprocessing complex. Such a MOX fuel fabrication facility should be outside the scope of regulations for a reprocessing plant even if the facility were to be collocated.

Any comingled reprocessing plant waste and MOX plant waste raises a unique regulatory issue which underscores that a single set of regulations for a reprocessing plant may well be problematic.

I hereby submit the attached 3-page document for the record.

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Risky Plutonium Fuel (MOX) Proposed for Use in U.S. Reactors, At Taxpayers' Expense

ISSUE BRIEF

The beleaguered nuclear industry, desperate for more handouts from taxpayers, wants the government to continue to fund a dangerous, multibillion dollar program in which it would use leftover weapons plutonium as fuel in commercial nuclear reactors.

There are two key reasons the MOX program is a bad idea and must be terminated. First, mixed oxide plutonium fuel, called MOX, is more dangerous than conventional nuclear fuel because it can burn hotter and also because it has the potential to cause more cancers in the event of a severe accident resulting in radiation release. Second, there are serious questions about the economic and technical feasibility of the MOX program, especially after a MOX test was prematurely halted in 2008. This means that when the project fails, taxpayers will be stuck with a multibillion dollar bill in return for little or no electricity generation.

Friends of the Earth is calling for the elimination of the U.S. MOX fuel program. Here's what you need to know.

Safety concerns, links to Japan, and proposals for use in the U.S.

- A French study found that "MOX fuel shows a higher failure potential than [traditional fuel] at comparable burnup."[1] In the event of a nuclear disaster, the releases from a MOX-fueled reactor will cause between 39 and 131 percent more fatalities than a traditionally fueled reactor.[2]
- Reactor 3 at Japan's Fukushima Daiichi plant, involved in the post-tsunami nuclear emergency, used MOX fuel, increasing the danger of radioactive releases from this reactor. MOX fuel was loaded into reactor 3 for the first time in the fall of 2010.[3]
- The Department of Energy is building a $4.8 billion factory at which MOX fuel would be produced at the Savannah River Site in South Carolina. The government-owned French plutonium company AREVA has been hired to build and operate the project,[4] and would therefore be the prime financial beneficiary. The Department of Energy is considering sending fuel from this factory (if construction is ever completed and the plant is licensed by the Nuclear Regulatory Commission) to the Tennessee Valley Authority for use in its reactors.[5]
- The U.S. Department of Energy is planning for the use of MOX fuel in U.S. reactors of the same faulty design as the Fukushima reactors. Three of the Tennessee Valley Authority reactors, located at Browns Ferry in Alabama, are boiling water reactors of the GE Mark I design, like five of the six reactors at Fukushima Daiichi.[6] Three other reactors being considered for MOX use are

1 F. Schmitz, Institute de Protection et de Sureté Nucléaire, "The Status of the Cabri REP-Na Test Programme: Present Understanding and Still Pending Questions" (paper presented at the NRC/Industry Meeting on High-Burnup Fuel Issues, Rockville, MD, November 18-20, 1997).

2 Lyman, Edward. "Public Health Risks of Substituting Mixed-Oxide For Uranium Fuel in Pressurized-Water Reactors," Science & Global Security, 2000, Volume 9, pp. 9, 1, http://www.nci.org/PDF/lyman-mox-sgs.pdf

3 "Fukushima to Restart Using MOX Fuel for First Time," Nuclear Power Industry News, 17 Sept 2010, http://nuclearstreet.com/nuclear_power_industry_news/b/nuclear_power_news/archive/2010/09/17/fukushima-to-restart-using-mox-fuel-for-first-time-091704.aspx

4 Areva, "NATIONAL NUCLEAR SECURITY ADMINISTRATION-THE MOX PROJECT," 13 June 2011, http://us.areva.com/EN/home-111/areva-federal-services-mox-fuel-fabrication-facility.html

5 National Nuclear Security Administration Budget, Department of Energy FY2012 Congressional Budget Request, February 2011, http://www.cfo.doe.gov/budget/12budget/Content/Volume1.pdf pg. 393

6 Bill Dedman, "General Electric-designed reactors in Fukushima have 23 sisters in U.S." MSNBC, 13 March 2011, http://openchannel.msnbc.msn.com/_news/2011/03/13/6256121-general-electric-designed-reactors-in-fukushima-have-23-sisters-in-us

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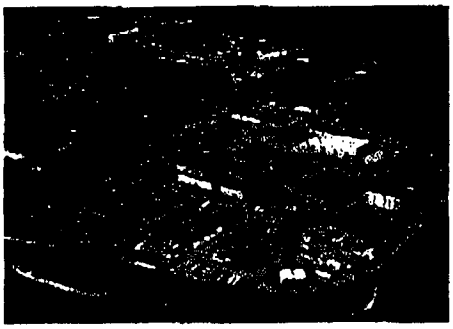
pressurized water reactors; these are at the Watts Bar and Sequoyah plants in Tennessee.[7]

- A boiling water reactor with GE Mark II containment at Energy Northwest's Columbia Generating Station in Richland, Washington is also under consideration as a site for MOX fuel use. Government documents obtained by Friends of the Earth indicate that Energy Northwest hoped to keep its plans to use MOX fuel secret from the media.[8]

Feasibility questions, economic concerns, and what it means for taxpayers

- The budget request for various aspects of the MOX program in Fiscal Year 2012 is around $850 million, with $385 million for the MOX plant construction. The MOX plant at the Savannah River Site is about 41 percent complete[9] and its $4.9 billion current cost is three times the $1.6 billion estimate from 2004.[10] The project is already 9-10 years behind schedule.[11]



MOX plant at the Savannah River Site.

- MOX fuel made from weapons-grade plutonium, which has a higher content of plutonium-239 than reactor-grade plutonium, has never been used before on a commercial scale and such MOX has never been tested in a boiling water reactor.
- Due to "excessive assembly growth," the only test of weapons-grade MOX in a pressurized water reactor was cancelled by Duke Energy before it was completed in 2008.[12] The abnormal expansion of the fuel assemblies and control rod guide tubes due to radiation exposure could have slowed the flow of coolant water in the reactor core and prevented proper insertion of control rods.[13]
- Testing and post-irradiation examination of MOX fuel will be required in the Tennessee Valley Authority reactors before full-scale use can be considered; such testing could take 8 years or more.[14] After the test, it's not guaranteed that TVA would pursue MOX use or that the Nuclear Regulatory Commission would license full-scale MOX use.
- When it is eventually completed, the MOX plant at the Savannah River Site is at risk of sitting idle. Before weapons-grade MOX is used commercially, it will have to be tested. The only other plant that has produced weapons-grade

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7 United States Nuclear Regulatory Commission. "List of Power Reactor Units." http://www.nrc.gov/reactors/operating/list-power-reactor-units.html

8 Friends of the Earth. "Secret Plan Exposed to Use Surplus Weapons Plutonium in Washington State Nuclear Reactor." 3 Feb 2011. http://foe.org/secret-plan-exposed-use-surplus-weapons-plutonium-washington-state-nuclear-reactor

9 National Nuclear Security Administration, Nuclear Nonproliferation Program, Savannah River Site. Presentation by Kevin Hall, SRS official, to SC Governor's Nuclear Advisory Council. June 9,2011

10 Defense Nuclear Nonproliferation, FY2004 Budget Summary. http://www.cfo.doe.gov/budget/04budget/content/defnn/nn.pdf pg. 780.

11 Defense Nuclear Nonproliferation, FY2002 Congressional Budget. http://www.cfo.doe.gov/budget/02budget/defnucl/defnucl.pdf pp. 170, 192.

12 Catawba Unit 1 Cycle 18, Memo from Duke Energy to Nuclear Regulatory Commission. June 10, 2008. http://www.foe.org/sites/default/files/Catawba%20core%20report%206.08.pdf

13 AREVA Fuel Assembly Test Failure Dooms Plutonium Fuel Test, 6 Aug, 2008. http://prismwebcastnews.com/2008/08/06/areva-fuel-assembly-test-failure-dooms-plutonium-fuel-test/ 04/08-09/2008, Fuel Performance Meeting Slides. Available on U.S. NRC Web-based ADAMS. Accession Number; ML081300390

14 Energy Northwest. "MOX Fuel – Board Presentation." June 2009. http://www.foe.org/sites/default/files/2010-02_Clements_Partial_Response_3-8-2010-1.pdf pp. 22-23.

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MOX, France's Atelier de Technologie du Plutonium, has shut down.[15] If the Savannah River Site MOX plant were to begin start-up testing in 2016[16] and produce eight assemblies by 2018,[17] it could then be forced to idle until testing results are obtained.[18] Capability exists at the Savannah River Site to mix the plutonium with existing high-level radioactive waste and immobilize it in a glassified form in robust containers, a safer disposal method.[19]

- Introduction of plutonium fuel into commerce presents a great nuclear non-proliferation risk and sends the dangerous message worldwide that use of plutonium as a nuclear power fuel is acceptable.

Recommendations

- While the goal of the MOX program -- to take plutonium and convert it to a form unusable for nuclear weapons -- is noble, management of plutonium as waste is cheaper, quicker, safer and poses fewer proliferation risks than attempting to use it as a risky fuel in aging nuclear reactors.[20]
- Immobilization of plutonium in high-level waste storage casks should be the sole focus of this program.
- Congress must immediately begin proper oversight of this troubled program, including a comprehensive investigation by the Government Accountability Office (GAO).
- Funding for the DOE's MOX program must be terminated by both the House and senate the Energy and Water Development Subcommittees (of the Appropriations Committees) and transferred to secure storage and disposition of plutonium as nuclear waste. The public should ask members of these subcommittees to terminate MOX funding.

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15 French Nuclear Safety Authority 2005 Annual Report. http://annual-report2005.asn.fr/chap13/chap13-12.html
16 National Nuclear Security Administration, Nuclear Nonproliferation Program, Savannah River Site. Presentation by Clay Ramsey, Federal Project Director, Mixed Oxide Fuel Fabrication Facility. January 6,2011 http://www.fpe.org/sites/default/files/MOX%20overview%20to%20BRC%20by%20Ramsey%201.6.11.pdf
17 TA Keys, "Evaluation of Using MOX Fuel in TVA Reactors," http://pbadupws.nrc.gov/docs/ML1017/ML101740637.pdf pg. 10.
18 National Nuclear Security Administration Budget. Department of Energy FY2012 Congressional Budget Request. February 2011. http://www.cfo.doe.gov/budget/12budget/Content/Volume1.pdf pg. 377
19 "Surplus Plutonium Disposition Supplemental Environmental Impact Statement." Notice in Federal Register, July 19, 2010. http://www.sodsupplementaleis.com/
20 Report to Congress: Disposition of Surplus Defense Plutonium at Savannah River Site. http://www.ncl.org/pdf/doe-pu-2152002.pdf pg. ES-2

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