

From: Louis Zeller [BREDL@skybest.com]  
Sent: Sunday, June 15, 2003 4:23 AM  
To: Tim Harris  
Subject: February 2003 Draft EIS for the Mixed Oxide Fuel Fabrication Facility at SRS

## BLUE RIDGE ENVIRONMENTAL DEFENSE LEAGUE

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May 14, 2003

US Nuclear Regulatory Commission

Michael T. Lester, Chief

Rules & Directives Branch

Division of Administrative Services

Office of Administration, Mail Stop T-6D59

Washington, DC 20555-0001

Re: February 2003 Draft EIS for the Mixed Oxide Fuel Fabrication Facility at SRS

Dear Sir:

On behalf of the Board of Directors of the Blue Ridge Environmental Defense League and our members in South Carolina, I write to provide additional comments on the draft *Environmental Impact Statement on the Construction and Operation of a Mixed Oxide Fuel Fabrication Facility at the Savannah River Site, South Carolina* prepared by Argonne National Laboratory for the U.S. Nuclear Regulatory Commission (DEIS).

In accord with the federal *Code of Federal Regulations*, Title 10, Part 70 (10 CFR 70), 10 CFR 51, and 40 CFR 1500, the NRC is to address the direct, indirect, and cumulative impacts related to building, operating, and decommissioning the proposed plutonium fuel (MOX) facility at SRS. However, the DEIS fails to address several major environmental impact at the proposed facility.

According to the DEIS, the purpose of the proposed 41-acre plutonium fuel factory located in the F-Area of SRS would be to convert 37.5 tons of weapons-grade plutonium into a mixed oxide fuel of uranium and plutonium. However, the declaration "surplus plutonium" is not a technical term; it is a political phrase without scientific basis. For example, the January 2000 DOE Record of Decision (ROD) stated 36.4 tons of surplus plutonium would be converted into MOX-fuel and another 19 tons was to be immobilized. Total "surplus plutonium" was then 55.4 tons. Nine months later, Russia and the United States designated 37.5 tons of weapons-grade plutonium as surplus, a difference of 47% (*Agreement between the Government of the United States of America and the Government of the Russian Federation Concerning the Management and Disposition of Plutonium Designated as No Longer Required for Defense Purposes and Related Cooperation*, September 2000).

The proposed plant would actually be licensed to handle up to 3.9 tons of plutonium dioxide annually for a period of 20 years. Therefore, the plant envisioned by NRC has the potential to handle a total of 78 tons of plutonium. The DOE is on record stating that it has a stockpile of 123 tons of plutonium (111.4 MT), of which 94 tons (85.1

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MT) is weapons-grade plutonium (*Plutonium: The First 50 Years*, DOE, 1996). During the next two decades, treaty obligations could conceivably result in 78 tons of "surplus plutonium" being declared. However, the February 2003 draft states, "This DEIS is based on a total of 34 MT (37.5 tons) of surplus plutonium." Notwithstanding this arbitrary and capricious estimate, the potential to emit air pollutants (PTE) for this facility should be based on the maximum annual throughput for the licensing period. This is the standard methodology utilized by federal and state agencies to evaluate major sources of pollution. To be valid, the EIS must be based on the maximum throughput of 78 tons of plutonium in its estimates of both criteria pollutants and hazardous air pollutants, including radionuclides.

The DEIS omits a critical component of plutonium disposition. The plutonium-MOX fuel would be fabricated for the sole purpose of irradiating it in nuclear reactors. In order to irradiate all the weapons-grade plutonium produced by the proposed fuel factory as outlined by DOE and NRC, additional and as yet unknown commercial nuclear power reactors must be designated. Originally, DOE had contracted with two electric utilities to provide this service: Duke Energy and Virginia Power. But Virginia Power has withdrawn its reactors from the program, leaving Duke as the sole provider of plutonium irradiation reactors. Duke's Catawba and McGuire reactors cannot provide sufficient capacity to irradiate 37.5 tons of plutonium. The DEIS acknowledges this deficiency but offers no remedy:

The DOE had earlier identified Duke Power Company's four reactors at the Catawba and McGuire stations (two at each station) as potential candidates to irradiate MOX fuel. The potential candidate reactors can accommodate up to 25.5 MT (28.2 tons) of surplus plutonium in MOX fuel. The DOE has not yet identified the additional candidate reactors necessary to accommodate the additional MOX fuel (8.5 MT [9.4 tons]) to be irradiated under the amended ROD. [February 2003 DEIS, 1.1.1 Surplus Plutonium Disposition Program]

In order to address the direct, indirect, and cumulative impacts related to the proposed plutonium fuel factory, NRC should include impacts of the maximum throughput to its analysis of impacts on mission reactors including fuel transportation and irradiation, and dumping in a waste repository in DEIS Section 4.4.3.

The February 2003 draft states, "For purposes of this DEIS, a period of operation of 10 years is assumed to bound impacts." Again, there is no rational basis to delimit environmental impacts to a period less than the expected licensing period. In order to be truly conservative, NRC should utilize a twenty-year basis for all its analyses.

Hazardous and radioactive wastes are permitted to be burned in the H-Area Consolidated Incinerator Facility (Unit ID # H-010). Although South Carolina DHEC has stated that the CIF is not currently in operation, it recently granted DOE-Westinghouse Savannah River Company a new permit to operate the waste incinerator. The DEIS states that the Waste Solidification Building will send waste to other facilities at SRS:

The WSB would process liquid waste streams from the PDCF and proposed MOX facility. Other waste from the proposed MOX facility, not sent to the WSB, would be transferred to and managed by the SRS. . [February 2003 DEIS, Executive Summary]

The CIF is required to comply with 40 CFR 61 Subpart H, *National Emission Standards of Radionuclides Other Than Radon From Department of Energy Facilities*. Although radionuclide emission rates from the stacks of the CIF and other sources are measured, the millirem standard for maximum allowable dosage to the public is an ambient standard, not an emission limit. Without ambient measurements, neither DOE nor Westinghouse Savannah River Company can assure that emissions of radionuclides are below 10 millirem per year to any member of the public. Likewise, the NRC fails to cite any direct ambient measurement a basis for estimates of radioactive dose to the public in the DEIS. The DEIS states:

The annual collective dose to members of the public (i.e., those living and working within 80 km [50 mi] of the SRS) produced by routine operation of the proposed MOX facility would be expected to result in a latent cancer fatality (LCF) rate of approximately 0.0004/yr or less. Routine operation of the proposed MOX facility, the PDCF, and the WSB is expected to produce insignificant air quality impacts, and would not cause exceedance of any ambient air quality standards for criteria pollutants at the SRS. However, maximum levels of  $PM_{2.5}$  in the vicinity of the SRS already exceed the annual standard of  $15 \mu g/m^3$ . Facility construction would contribute temporarily less than 0.1% of this  $PM_{2.5}$

standard level, and facility operation would contribute less than 0.01% of this level. [February 2003 DEIS, Executive Summary]

About a year ago the DOE jettisoned the immobilization option which had been posited by Secretary O'Leary in 1996. [Amended Record of Decision for the Surplus Plutonium Disposition Program, Federal Register 67:19432, April 19] Secretary Abraham cited cost-savings and pressure from the Russian Federation as reasons for ending the two-track, or hybrid, approach. The February 2003 draft states:

[I]n April 2002, the DOE issued an amended ROD (DOE 2002), in which it decided not to pursue its hybrid approach. The DOE determined that in order to make progress with available funds that only one approach could be supported. Russia does not consider immobilization alone to be an acceptable approach because immobilization, unlike the irradiation of MOX fuel, fails to degrade the isotopic composition of the plutonium. Russia further contends that the United States could easily retrieve plutonium from the immobilized waste at a later date and reuse that plutonium in nuclear weapons (DOE 2002). Because an immobilization-only approach would jeopardize Russia's continued involvement in the joint effort to reduce supplies of weapons grade plutonium, the DOE decided that if only one disposition approach is to be pursued, the MOX fuel approach is the preferred one. [February 2003 DEIS, 1.1.1 Surplus Plutonium Disposition Program]

But the record reveals quite a different picture. From the beginning both the American and the Russian plutonium programs have been bankrolled by the U. S. Treasury. The decision by the DOE to utilize the more expensive plutonium fuel option was not made in the interest of either the American or the Russian people. Experts in both countries have lambasted the decision. The Washington-based Nuclear Control Institute condemned the amended ROD:

Moreover, the Bush Administration continues to cave in to Russia's insistence that plutonium from dismantled warheads be recycled as mixed-oxide ("MOX") fuel for commercial nuclear power plants. "The Energy Department's own studies document that the MOX approach is far more expensive and dangerous than directly disposing of plutonium by immobilizing it as waste," noted Dr. Edwin Lyman, NCI scientific director. "The Bush Administration reportedly pressured President Putin to accept U.S. terms in the draft nuclear arms agreement, but has never been willing to resist Russia's ambitions to pursue a MOX-only plutonium disposal strategy. Russia cannot afford to pursue any plutonium disposition strategy on its own. If the U.S. Government made it a priority, an immobilization approach could be up and running in a relatively short period of time." May 14, 2002 NCI press release, <http://www.nci.org>,

Ten time zones away Russian experts who support dismantlement of nuclear weapons continually call for abolition of the plutonium fuel program and advocate immobilization of weapons-grade plutonium. Opposition to plutonium fuel programs based on the negative health and safety aspects continues unabated in cities across the Russian Federation. A Russian group's recent press release (Appendix A) stated:

"Using plutonium as a fuel for NPPs [nuclear power plants] may lead to nuclear accidents and plutonium pollution of the Russian territories. It also gives the possibility of nuclear material theft and proliferation," said Vladimir Sliviyak, Ecodefense co-chair. "Plutonium must be immobilized and never used again", he added. In 2000, Russian and US governments agreed on disposing 68 t of weapon-grade plutonium (34 t each). Cost of Russian part of the program is nearly \$2 billion while the US part exceeds \$4 billion. According to this approved scheme, weapon-grade plutonium must be mixed with uranium to fabricate MOX fuel (Mixed Oxides of uranium and plutonium) which then would be used in civil nuclear reactors. This plan includes the construction of new facilities in Savannah River Site (US) and Seversk (near Tomsk city, Siberia/Russia) to produce weapons grade MOX and then burning the fuel in civil reactors. In 1993, an explosion at the Seversk facility, where plutonium is extracted out of dissolved spent uranium fuel elements, caused plutonium contamination around facility. Involving plutonium into the civil nuclear industry may lead to new nuclear reactor accidents, plutonium contamination of Russian and US territories, and nuclear proliferation. <http://www.antiatom.ru/entext/030528anc.htm> Antiatom.ru, May 28, 2003

The NRC has arbitrarily determined that immobilization of plutonium does not require an in-depth evaluation because it is not a "reasonable alternative" and because the agency seeks to avoid foreign policy issues. One of the most dumb sounding statements in the DEIS:

The second reason that immobilization is no longer a reasonable alternative to the proposed action is its connection with the conduct of United States foreign policy. Evaluating the immobilization alternative now would involve the NRC in foreign policy matters that the DOE has been conducting on behalf of the United States. In the NRC's view, an alternative that would block the implementation of an agreement with another country involves foreign policy matters that are outside NEPA's scope. Therefore, the NRC concludes that immobilization is not a reasonable alternative requiring detailed analysis in this DEIS. (February 2003 DEIS, 2.3.3 Immobilization of Surplus Plutonium)

Despite numerous requests to evaluate the technical aspects of immobilization by people at public meetings in North Augusta, South Carolina; Savannah, Georgia; and Charlotte, North Carolina, the NRC steadfastly refuses to accede to the wishes of the citizens most directly affected by the proposed plutonium dismantlement operations at SRS. The possibility that environmental impacts may affect policy considerations foreign or domestic most certainly does not negate the requirements of NEPA. The NRC simply cannot recycle the mendacity of the DOE and its contractors. A comprehensive analysis of the impacts of the plutonium-MOX facility must needs include a side-by-side comparison with immobilization.

Perhaps the most stunning flaw in the DEIS is the failure to even consider possible environmental consequences of terrorist acts on plutonium-MOX fuel fabrication and transportation. The February 2003 draft states:

Many commenters raised a number of different issues concerning terrorism. The Scoping Summary Report stated that the EIS would not address the impacts of terrorism because these impacts are not considered to be reasonably foreseeable as a result of the proposed action. However, following the events of September 11, 2001, the Commission decided to consider the question of whether NEPA requires the evaluation of such impacts. By order dated December 18, 2002 (CLI-02-24), the Commission ruled that NRC has no obligation under NEPA to consider intentional malevolent acts in conjunction with the licensing of the proposed MOX facility. [February 2003 DEIS, 1.4.1 Scoping Process]

Because the plutonium-MOX fuel plan necessitates shipping nuclear weapons-usable plutonium over enormous distances, it might well increase the likelihood that such material could fall into the hands of terrorists. The U.S. National Academy of Sciences stated that shipments of plutonium fuel will require security measures equivalent to those needed for transport of nuclear weapons. Harvard Law School and the United Kingdom Royal Commission on Environmental Pollution have also raised concerns about the security measures needed for plutonium as an article of commerce.

A report prepared by a special commission of International Physicians for the Prevention of Nuclear War and the Institute for Energy and Environmental Research states:

Using plutonium as fuel on a large scale would be difficult to safeguard and would involve a high risk of diversion. In the case of plutonium from weapons, there would be a regular traffic of plutonium oxide from dismantlement and storage sites to fabrication facilities and reactors, with the risk of attack along transportation routes. [International Physicians for the Prevention of Nuclear War and The Institute for Energy and Environmental Research, *Plutonium: Deadly Gold of the Nuclear Age*, International Physicians Press, Cambridge Massachusetts, 1992, p.133-134]

MOX fuel has a greater quantities of plutonium and other hazardous radioactive isotopes such as Americium 241 and Curium 242—actinide elements which would cause additional harmful radiation exposure to the public.

Public attention has been drawn to the higher actinide inventories available for release from MOX than from conventional fuels. Significant releases of actinides during reactor accidents would dominate the accident consequences. Models of actinide release now available to the NRC staff indicate very small releases of actinides from conventional fuels under severe accident conditions. (emphasis added) [Letter from Advisory Committee on Reactor Safeguards to Nuclear Regulatory Commission Chairman, May 17, 1999]

The plutonium oxide fuel would be a valuable target. The Department of Energy's program would transport plutonium from Defense Department sites to South Carolina for fuel fabrication. From Savannah River tons of plutonium in mixed oxide fuel would be transported across hundreds of miles of isolated countryside to utility reactors in North Carolina and South Carolina. This overland transport link presents a unique opportunity to those who might intercept and divert the fuel for weapons use. The freshly fabricated fuel rod assemblies would be the most desirable form for groups who would go after the plutonium for unlawful use in their own explosive devices. DOE admits this vulnerability:

[T]he unirradiated fuel contains large quantities of plutonium and is not sufficiently radioactive to create a self-protecting barrier to deter the material from theft....

Revised Conceptual Designs for the FMDF Fresh MOX Fuel Transport Package, Ludwig et al, ORNL/TM-13574, March 1998

The risks of deliberate diversion and/or destruction of a fresh nuclear fuel or irradiated waste transport cask are increased by plutonium fuel. Higher actinide inventories increase the public health risks. The strategic value of plutonium oxide for new weapons increases the threat of diversion.

On October 9, 1995, a ten car Amtrak train with 248 passengers and twenty crew was derailed near Hyder, Arizona. Spikes had been removed from the rail bed, a metal bar connecting the rails had been removed, and the missing section wired to circumvent the electronic warning system. A terrorist group, Sons of the Gestapo, left a note at the scene claiming credit and criticizing law enforcement agencies, citing the Waco and Ruby Ridge incidents.

On October 1, 1995 a jury convicted Sheik Omar Abdel Rahman of conspiracy to use diesel-fertilizer bombs which would have been used to blow up United Nations headquarters, the Lincoln and Holland tunnels, the George Washington Bridge, and the New York federal building. The George Washington Bridge has been used for shipments of irradiated fuel and plutonium from Brookhaven National Laboratory to the Savannah River Site.

Incidents of rail and highway sabotage reveal that: 1) terrorist attacks would likely be designed to inflict maximum human injury, 2) electronic warning systems designed to alert officials and prevent accidents can be defeated by technical countermeasures, 3) effective attacks using home made explosives are possible, avoiding the need for exotic military weapons to breach transport containers, and 4) saboteurs have the ability to create damage which exceeds the containment standards of NRC certified shipping containers.

The willingness of terrorists to kill or injure large numbers of Americans, demonstrated in the World Trade Center and Oklahoma City bombings, compels any current assessment to focus on incidents that are clearly intended to cause, or could cause, radiological sabotage." The FBI's Terrorism in the United States: 1995 reported: "In the past year, the country witnessed the re-emergence of spectacular terrorism with the Oklahoma City bombing. Large-scale attacks designed to inflict mass casualties appear to be a new terrorist method in the United States. [*Nuclear Waste Transportation Security and Safety Issues: The Risk of Terrorism and Sabotage Against Repository Shipments*, Halstead and Ballard, December 1998]

Halstead and Ballard state that risk assessments must consider direct attacks on transport casks using high energy explosive devices with or without capture of the shipments. Capture and control of the cask by terrorist agents would allow the cask to be breached with a variety of devices including commercially available conical shaped charges and cutting charges, or a massive diesel fuel-fertilizer truck bomb. Attackers may use transport personnel as hostages to retain control of the cask for hours. With the time gained, attackers could increase the effect of explosives by removing barriers and applying them to the most vulnerable part of the cask.

Full scale tests by Sandia National Laboratory published in 1983 utilized a military shaped charge (US Army M3A1) on a GE IF-200 truck cask containing unirradiated fuel. Even this outdated test demonstrated that the cask could be breached and that radioactive materials would be released.

Current weapons, such as the Superdragon anti-tank missile, are more powerful and can penetrate 18 inches of armor plate. This weapon was used by the U.S. in Operation Desert Storm, and is used by at least ten other

nations. The release of even more toxic radioactive elements would cause more fatalities immediately following an accident. Lindsay Audin's analysis of fuel rod behavior during incidents involving sabotage explains how much greater amounts of fine particles and vapors would be released from a conventional irradiated fuel cask.

An attempt to disperse the fuel would likely involve a high explosive device that must first penetrate a transport cask. Such a device would penetrate one or both sides of the cask, shatter the fuel rods and pellets in its path, and heat the area along that path. The shock and heat involved would...initiate several processes not normally experienced by uranium dioxide and zirconium alloy. At high temperatures in the presence of oxygen, both materials will change form. Uranium dioxide UO<sub>2</sub> will "reoxidize" and become U<sub>3</sub>O<sub>8</sub>...expanding and forming a very fine powder in the process. Zirconium will literally ignite, vaporizing itself.... The fuel pellets may also shatter back to the consistency of the uranium powder involved in their manufacture. Ruthenium will vaporize and combine with oxygen to form minute particles, while other elements, such as iodine, will be released as gases. [Analyses of Cask Sabotage Involving Portable Explosives: A Critique, Lindsay Audin, 1989]

Emergency response to rail or highway accidents must be well-prepared and rapid. Delays in response to accidents which involve the release of radioactive material would expose unknown numbers of people to negative health effects. In 1996, a DOE Transport and Safeguards Division Safe Secure Transport (SST) trailer carrying nuclear weapons slid off the road and rolled over in rural Nebraska. Four hours elapsed before DOE headquarters were notified, and it was 20 hours before a Radiological Assistance Program team determined there was no release. A similar delay in response to a plutonium-MOX fuel accident could make effective emergency response dangerous and clean-up impossible. The following comment by the Georgia Environmental Protection Division cites vehicular tests of powdered materials deposited on roadways and takes issue with the DOE's approach to emergency response to accidental plutonium fuel releases.

After passage of about 100 cars only a small fraction of the original contamination remained on the road surface. Unless emergency officials promptly close the accident scene to vehicle traffic (an unlikely situation), emergency responders may face an incident scene that is, unknown to them, extremely hazardous due to respirable plutonium. Post emergency actions may also be complicated due to the enhanced spread of contamination by vehicle traffic. [Georgia Environmental Protection Division comments on DOE SPD DEIS]

The NRC must go back to the drawing board and include a full-scale environmental impact analysis of potential terrorist acts on plutonium-MOX fuel shipments. The Commission's order of December 18, 2002 (CLI-02-24) which found that the NRC has no obligation under NEPA to consider intentional malevolent acts in conjunction with the licensing of the proposed MOX facility is so wrong it beggars description. Even if CLI-02-24 does not find an obligation to investigate potential terrorist acts, you have an obligation as Americans in the 21<sup>st</sup> Century to use due diligence in this matter.

Respectfully,

Louis Zeller

Southern Anti-plutonium Campaign Director

Cc: Tim Harris

Attachment

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