

Blue Ridge Environmental Defense League

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October 10, 2012

Ms. Sachiko McAlhany
SPD Supplemental EIS
U.S. Department of Energy
P.O. Box 2324
Germantown, MD 20874-2324.

RE: SPD Supplemental EIS, DOE/EIS-0283-S2

Dear Ms. McAlhany:

On behalf of the Blue Ridge Environmental Defense League and our members in South Carolina, Georgia, Tennessee and Alabama, I submit the following additional comments regarding the Surplus Plutonium Disposition Supplemental Environmental Impact Statement noticed in the Federal Register on July 27, 2012.¹ Our previous comments were submitted on September 4th by Charles N. Utley.

As you know, the SPD Supplemental EIS analyzes the environmental impacts of an additional 14.4 tons of plutonium from dismantled nuclear warheads, the manufacture of 37.5 tons of plutonium fuel at SRS, and its use in commercial nuclear reactors operated by the Tennessee Valley Authority at Sequoyah in Tennessee and Browns Ferry in Alabama.²

Nuclear Contractor at SRS Disregards Health and Safety

Estimates of the costs of the plutonium fuel program construction project are now approximately \$9.7 billion. The principal contractor for the plutonium fuel factory, and most likely for the proposed additional operations, is Shaw AREVA MOX Services, formerly known as Duke Cogema Stone and Webster. A report issued by the Safe Energy Communications Council before the name change entitled *The COGEMA File* recommends that, given the company's abysmal record, COGEMA should be barred from doing business in the United States. The report states, "COGEMA has chosen to disregard findings of extreme contamination and health effects resulting from its own reprocessing activities and has refused to abate its discharges as requested by European governments and mandated by international laws and treaties."³

¹ Federal Register Volume 77, Number 145, Pages 44222-44224, July 27, 2012

² Commercial nuclear fuel typically contains the oxide form of uranium. The nuclear industry's term for this experimental fuel is "MOX" because it is a mixed oxide containing both uranium and plutonium. But the *primary fissile isotope* of the fuel is plutonium, so we prefer the more accurate term "plutonium fuel."

³ "The COGEMA File, Incidents impacting the environment, health and the law by the French nuclear company, COGEMA," by Linda Gunter, Safe Energy Communication Council, October 1, 2002

Legal Claim Involving Areva Fuel Fabrication ⁴

Our investigation of filings at the Securities Exchange Commission revealed a legal dispute between TVA and Areva. TVA's 2006 10-K report states that on November 9, 2005, it received invoices totaling \$76 million from Areva and an affiliated company, the successor to Babcock and Wilcox. In 1970, TVA had contracted with B&W for fuel fabrication services for its Bellefonte Nuclear Plant. Areva claimed that the 1970 contract required TVA to buy more fuel services from B&W than TVA actually purchased. In 2006 TVA received a letter from Areva which reduced the value of the claim to \$26 million but did not provide further information or a reason for the reduction in the claim. At present, we have been unable to learn any more about this dispute. Therefore, pursuant to NEPA specifically, Section 102 42 U.S.C. 4332d which states all federal agencies shall identify and develop methods and procedures...which will insure that presently unquantified environmental amenities and values may be given appropriate consideration in decisionmaking along with economic and technical considerations, we hereby request that DOE review the track record of Areva in the proposed area of work before making a final decision.

However, in light of what is already known about Areva/Cogema, we believe that the company represents a threat to public health in the Central Savannah River Area and should not qualify for any further work at SRS.

Russian-American Security Agreement: No Plutonium Fuel

For over a decade, the Blue Ridge Environmental Defense League has opposed the reprocessing of plutonium as civilian nuclear power fuel because it presents unsupportable risks to public safety and the environment. For about as long, we have worked with Russian non-governmental organizations who also support dismantling of nuclear weapons but who also call for abolition of the plutonium fuel program. Our joint opposition to plutonium fuel programs is based on the negative health and safety aspects of plutonium fuel in commercial nuclear power plants. Vladimir Sliviyak, Ecodefense co-chair, 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. Plutonium must be immobilized and never used again.⁵

Our Russian counterparts and we share the common goals of eliminating both atomic weapons and the reprocessing of nuclear waste for use as fuel.

⁴ Tennessee Valley Authority · 10-K · For 9/30/06, Filed On 12/15/06 3:11pm ET · SEC File 0-52313 · Accession Number 950144-6-11558, downloaded 10/9/12 at <http://www.secinfo.com/dsVsf.vB99.htm#77is>

⁵ Antiatom.ru, available at <http://www.antiatom.ru/entext/030528anc.htm>

Risks of Sabotage and Terrorism

The plutonium fuel plan necessitates shipping nuclear weapons-usable materials over enormous distances which will increase the likelihood that such material could fall into the hands of malefactors. 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.⁶

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.

From Savannah River tons of plutonium in the form of mixed oxide fuel would be transported across hundreds of miles of isolated countryside to utility reactors in Alabama and Tennessee. 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's experts admit 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....⁷

Fuel assemblies would each contain about 20 kilograms of plutonium. According to a technical analysis by the Natural Resource Defense Council, a one kiloton nuclear bomb can be made with one to three kg of plutonium.⁸ Thus, plutonium fuel poses a security threat from the standpoint of its attractiveness to thieves.

⁶ 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

⁷ Revised Conceptual Designs for the FMDP Fresh MOX Fuel Transport Package, Ludwig et al, ORNL/TM-13574, March 1998

⁸ Thomas B. Cochran and Christopher E. Paine, *The Amount of Plutonium and Highly-Enriched Uranium Needed for Pure Fission Nuclear Weapons* at 6 (Revised April 13, 1995). This report was available to be downloaded September 9, 2012 at <http://www.nrdc.org/nuclear/fissionw/fissionweapons.pdf>.

Use as Fuel Will Not Reduce Inventories of Plutonium

Allegedly, the purpose of plutonium oxide fuel is disposition or disposal. But this is not realistic. Nuclear reactors using standard uranium fuel produce plutonium where none existed before. A typical commercial reactor produces 500 pounds of plutonium a year. Government contractors have estimated that using plutonium oxide in commercial reactors would reduce the total plutonium by only 1%.

Plutonium Fuel Hazardous for Generating Electric Power

BREX's safety concerns are based on evidence that plutonium fuel rods fail at far lower temperatures, 400 to 570 degrees-F lower, than conventional uranium fuel rods. Also, the metal sheath, or cladding, which holds the fuel rod together may form balloons which block cooling water, leading to an uncontrolled core meltdown.

TVA Nuclear Reactors Unsuitable

The Sequoyah power plant's nuclear reactors utilize ice condenser containments, baskets of borated ice, to reduce heat and pressure in the event of an accident. The containment buildings of ice condenser reactors are less expensive and less robust because of this construction method. Numerous problems with ice condensers have been identified. Sandia National Laboratories evaluated the reactor containment structures similar to those at Sequoyah Units 1 and 2 and found that if an accident involving hydrogen ignition occurs, the concrete containment will almost certainly fail.⁹ Also, such systems are particularly vulnerable to reactor sump clogging.

At Browns Ferry, plant inspections done by the manufacturer indicate that the plant suffers from cracking of the control rods necessary for shutting down the reactor. Based on this information, the manufacturer predicts that the control rods will fail sooner. An NRC Information Notice (IN) issued in June 2011 states:

The U.S. Nuclear Regulatory Commission (NRC) is issuing this information notice (IN) to inform addressees that GE Hitachi Nuclear Energy (GEH) has discovered severe cracking in Marathon control rod blades (CRBs) near the end of their nuclear lifetime limits in an international BWR/6. As a result of investigations into the cracking, GEH has determined that the design life of certain Marathon CRBs may be less than previously stated and is revising the end-of-life depletion limits of these CRBs. The NRC expects that recipients will review the information for applicability to their facilities and consider actions, as appropriate, to avoid similar problems.¹⁰

⁹ NUREG/CR-6427, Assessment of the Direct Containment Heating Issue for Plants With Ice Condenser Containments, April 2000

¹⁰ NRC Information Notice 2011-13: Control Rod Blade Cracking Resulting in Reduced Design Lifetime, June 29, 2011, ADAMS Accession No. ML111380019

Not only did 100% of the control rods inspected suffer from cracking, the damage was more widespread and more serious than previously known. The Information Notice continued:

In August 2010, GEH, as part of its surveillance program to monitor Marathon CRB performance, visually inspected four discharged CRBs at an international BWR/6 and found cracks on all four CRBs. The cracks were much more numerous and had more material distortion than those observed in previous inspections of Marathon CRBs. The cracks were also more severe in that they resulted in missing boron-carbide capsule tube fragments from two of the inspected CRBs.¹¹

Both Sequoyah and Browns Ferry present unacceptable risks for the use of plutonium fuel. The abandoning of plutonium fuel tests by Duke Energy and the earlier withdrawal of Dominion Virginia Power from the program should provide ample warnings to TVA that plutonium fuel, experimental and unique in its use of weapons-grade alloys, is ill-suited for commercial use and should never be used.

Conclusion

The use of plutonium fuel in the commercial power sector presents unique risks of accidents and diversion. Further, because chemical processing facilities for plutonium fuel can also be used to make plutonium pits for nuclear weapons, there is no way to ensure that plutonium reprocessing facilities for electric power will not be turned to military use. Radioactive waste from the Cold War should not be transmuted into a plutonium-fueled economy.

Respectfully,

A handwritten signature in black ink that reads "Louis A. Zeller". The signature is written in a cursive style and is followed by a horizontal line.

Louis A. Zeller
Executive Director, Blue Ridge Environmental Defense League

¹¹ *Id.*