

May 14, 2007

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE SECRETARY

In the Matter of)
Shaw AREVA MOX Services)
License Application for Possession and) Docket No. 70-3098
Use of Byproduct, Source and)
Special Nuclear Materials for the)
Mixed Oxide Fuel Fabrication Facility)

PETITION FOR INTERVENTION AND REQUEST FOR HEARING

Introduction

Pursuant to 10 C.F.R. § 2.309, 10 C.F.R. § 52.21, and a notice published by the Nuclear Regulatory Commission (“NRC” or “Commission”) at 72 Fed. Reg. 12,204 (March 15, 2007), Petitioners Blue Ridge Environmental Defense League (“BREDL”), Nuclear Watch South (“NWS”), and Nuclear Information Service (“NIRS”) hereby submit their contentions regarding the Shaw AREVA MOX Services (“MOX Services”) (formerly known as Duke, Cogema, Stone and Webster) application for a license to possess and use byproduct, source and special nuclear materials at a plutonium fuel¹ factory in Aiken, SC. As demonstrated below, these contentions should be admitted because they satisfy the NRC’s admissibility requirements in 10 C.F.R. § 2.309.

¹ The nuclear industry’s term for this novel fuel is “MOX” because it is a mixed oxide containing both uranium and plutonium. All commercial nuclear fuel contains oxides of uranium. But the *primary fissile isotope* of the nuclear fuel in this matter is plutonium, not uranium. So we elect to use the more precise term “plutonium fuel” throughout this brief.

Description of the Proceeding

This proceeding concerns an application by MOX Services for a license to possess and use byproduct, source and special nuclear materials at the Department of Energy's Savannah River Site in South Carolina. MOX Services submitted a license application on September 27, 2006. An NRC staff review of the LA determined modifications were required and on November 16, 2006 MOX Services submitted a revised LA. The submittals generally addressed the requirements of an operating license for a facility specified in 10 CFR Part 70 and NUREG-1718. The application was accepted for docketing via a letter dated December 20, 2006. Notice of license application and opportunity to request a hearing was published in 72 Fed. Reg. 12,204 (March 15, 2007)

Description of Petitioners

Blue Ridge Environmental Defense League is a regional, community-based non-profit environmental organization working in Virginia, North Carolina, South Carolina, Tennessee and Georgia. BREDL's founding principles are earth stewardship, environmental democracy, social justice, and community empowerment. BREDL encourages government agencies and citizens to take responsibility for conserving and protecting our natural resources. BREDL advocates grassroots involvement to empower whole communities in environmental issues. BREDL also functions as a "watchdog" of the environment, monitoring issues and holding government officials accountable for their actions.

Nuclear Watch South (formerly GANE, Georgians Against Nuclear Energy) is a regional, volunteer-based non-profit environmental group dedicated to phasing out nuclear power plants; abolishing nuclear weapons, safeguarding nuclear materials; and establishing ethical social policies for nuclear waste management.

Nuclear Information and Resource Service is a non-profit corporation with over 6000 members, many of whom live in the Southeastern part of the United States. NIRS has a mission to promote a non-nuclear energy policy, and a concern for the health and safety of the people and ecosphere that includes the Central Savannah River Area.

Standing

Pursuant to 10 CFR § 2.309, a request for hearing must:

set forth with particularity the interest of the petitioner in the proceeding, how that interest may be affected by the results of the proceeding, including the reasons why the petitioner should be permitted to intervene with particular reference to the factors set forth in 10 CFR § 2.309 (d)(1), and the specific aspect or aspects of the subject matter of the proceeding as to which the petitioner wishes to intervene.

In addition, the request for hearing must address: (1) the nature of the petitioner's right under the Atomic Energy Act to be made a party to the proceeding, (2) the nature and extent of the petitioner's property, financial, or other interest in the proceeding, and (3) the possible effect of any order that may be entered in the proceeding on the petitioner's interest. *Id*

Petitioners hereby request to be made a party to the proceeding because an operating license for a plutonium fuel factory would directly affect the health and well-being of our members living within 50 miles of SRS. Our basis for standing is supported

by the Final Environmental Impact Statement on the Construction and Operation of a Proposed Mixed Oxide Fuel Fabrication Facility at the Savannah River Site (NUREG-1767, Vol. 1) which bases its estimates of radionuclide dose to the public on the population within a 50 mile radius of the facility. The FEIS at paragraph 4.3.5.2 states:

Population doses were calculated for up to a distance of 80 km (50 mi) from the release point for 10 downwind distances and 16 wind directions. Radiation doses were calculated for the following receptors for accident conditions: *General population*: All members of the public within an 80-km (50-mi) radius of the site where the accident might occur. Short-term and 1-year impacts to the general population were assessed on the basis of the same exposure pathways as for the public, or off-site, MEI.

The environmental impact statement shows that the property, financial interests and health of the petitioners' members living within a 50-mile radius may all be directly affected by the proposed facility at SRS. Twenty affidavits signed by residents in South Carolina and Georgia and submitted with this petition authorize petitioners BREDL, NWS and NIRS to represent their interests in this matter. All but one of the affiants live from 20 to 32 miles from SRS. They own or rent homes and work within a the zone of impact.

Petitioners' standing to participate in this proceeding is demonstrated by the declarations of the following members of Petitioner organizations, who have authorized Petitioners to represent their interests in this proceeding.

Jeff Alston, BREDL member
Melvin Avery, BREDL member
Charles Barber, BREDL member
Susan Bloomfield, NIRS and NWS member
Tiffany Conyers, BREDL member
LaShonda Grier, BREDL member
David Gurr, NWS member
Henry Gurr, NWS member

Casetta P. Heard, BREDL member
Paul Heslip, BREDL member
Donald Johnson, BREDL member
William J. (Bill) Mareska, NIRS and NWS member
David Matos, NWS member
Dedra Sharp, BREDL member
Jennifer Singh, BREDL member
Alice Sullivan, NWS member
Darrell L. Toliver, BREDL member
Charles N. Utley, BREDL member
Lucille Vaughn, BREDL member
Gary Zimmerman, NWS member

The attached declarations show that Petitioners' members live near the proposed site, i.e., within 50 miles. Therefore, Petitioners have presumptive standing by virtue of their proximity to the new nuclear plant that may be constructed on the site.

Petitioners seek to protect their members' health, safety and lives, as well as the health and safety of the general public and the environment by opposing an operating license for the plutonium fuel factory through intervention in the above named proceeding. Petitioners seek to ensure that no license is issued by the NRC unless MOX Services demonstrates full compliance with the Atomic Energy Act, the National Environmental Policy Act ("NEPA") and applicable state law.

Synopsis of the Contentions to be Raised in this Petition

Petitioners set forth with particularity the specific aspects of the subject matter of this proceeding as to which they wish to intervene:

- 1) Whether MOX Services' License Application and/or EIS meet the relevant requirements in the National Environmental Policy Act and/or the Clean Air Act because of failures to address critical aspects regarding limits on emissions of hazardous air pollutants necessary for the protection of public health and safety;

- 2) Whether MOX Services License Application meets the relevant requirements of the Atomic Energy Act because of its failure to prepare and submit an emergency plan to the NRC for potential radioactive releases to the public.
- 3) Whether the Final Environmental Impact Statement on the construction and operation of a plutonium fuel factory is adequate to satisfy the requirements of NEPA and NRC implementing regulations because it fails to address new and significant information showing that neither MOX Services nor the U.S. Department of Energy (“DOE”) has any concrete plans for the Waste Solidification Building (“WSB”) that was proposed in the EIS and, as a result, high-alpha liquid waste from the proposed facility may have to be stored onsite posing hazards which have not been addressed by the NRC in the EIS.
- 4) Whether the License Application for the proposed plutonium processing facility is inadequate because it does not address safety and public health risks posed by indefinite storage of liquid high-alpha waste at the site or contain measures for the safe storage of that waste.
- 5) Whether the Final Environmental Impact Statement for the proposed plutonium processing facility meets the relevant requirements of NEPA because it does not evaluate the environmental impacts of a terrorist attack on the proposed factory.

CONTENTION ONE: FAILURE TO LIMITS EMISSIONS OF HAZARDOUS

AIR POLLUTANTS

There is significant new information relevant to environmental concerns and bearing on the proposed action. 10 CFR § 51.92 The License Application submitted by

MOX Services fails to meet the relevant requirements in the National Environmental Policy Act because it will not adequately address pollution impacts and require controls necessary to limit hazardous air pollution necessary for the protection of public health and safety. Specifically, the plutonium fuel factory as proposed by MOX Services will not meet Clean Air Act standards because: 1) without maximum achievable control technology, routine emissions from the plant would be excessive especially when considered in addition to the existing site-wide radioactive emission levels and 2) the company does not properly account for the higher levels of morbidity and mortality in females and infants caused by low levels of radiation.

Contention 1.1: The plutonium fuel factory proposed by MOX Services does not comply with national emission standards for radionuclides to the atmosphere.

Basis

The federal Clean Air Act established a federal program to limit the emission of hazardous air pollutants (HAPs). National emissions standards for hazardous air pollutants (NESHAPs) have been established to limit the release of 188 HAPs including radionuclides. Radionuclides are listed as hazardous air pollutants in Section 112 of the Clean Air Act (CAA) Amendments of 1977 (Public Law 95-95). NRC-licensed facilities must meet requirements of the Clean Air Act [40 CFR Part 61] which limit radionuclide emissions to the atmosphere.

Further, the plutonium fuel factory, if constructed, would be a U.S. Department of Energy (DOE) facility. Federal regulations (40 CFR § 61.92, Subpart H) limit a broad

range of radionuclide emissions from DOE facilities including the proposed plutonium fuel factory. . The goal of the radionuclide emission standard is to limit the lifetime risk of induced fatal cancer to a maximally exposed individual to approximately one in 10,000. The implementing regulations translate this into a maximum individual exposure of 10 millirem/year for airborne emissions that result in exposure through any environmental pathway. 40 CFR § 61.92 This translates into a risk of 5.6 excess fatal cancers/10,000 people. [BEIR V, Table 4-2, pp. 172-173.]

Certain airborne radionuclide emissions from the proposed plutonium fuel factory are predicted to exceed site-wide SRS emissions; the isotopes of neptunium-237, plutonium-241 and plutonium-240 from the proposed MFFF exceed SRS emissions for these isotopes by approximately 3 times, 24 times and 115 times, respectively (see table below). Therefore, the calculations in the plutonium fuel factory LA as compared to the EIS would appear to predict very different estimates of certain radionuclide emissions.

Airborne Radionuclide	SRS-EIS ^a	MFFF ^b License Application
Pu-238	3.59×10^{-4}	8.5×10^{-6}
Pu-239	2.05×10^{-3}	9.1×10^{-5}
Pu-240	1.99×10^{-7}	2.3×10^{-5}
Pu-241	4.09×10^{-6}	1.01×10^{-4}
Pu-242	7.03×10^{-9}	6.1×10^{-9}
Am-241	1.46×10^{-4}	4.8×10^{-5}

All values in curies

- a) Environmental Impact Statement on the Construction and Operation of a Mixed Oxide Fuel Fabrication Facility at the Savannah River Site, South Carolina, Table 3.8, February 2003
- b) Estimated Radiological Releases from the MFFF during Normal Operations, MFFF License Application, Revision 17 November 2006, Table 10.2-1 (values converted from microcuries to curies)

Contention 1.2 HEPA Filter Unreliability Allows Excess Radionuclide Risks.

Basis

According to the License Application paragraph 10.1.2.1, Control of Airborne Emissions, air pollutants from the plutonium fuel factory “are controlled by the heating, ventilation, and air conditioning (HVAC) system and a ventilation system that removes radionuclides, nitrous fumes, and other hazardous materials” from gaseous process emissions. Airborne pollutants from plutonium fuel processes is routed through the HVAC system and ventilation exhaust passes through high-efficiency particulate air (HEPA) filters. But according to Dr. Peter Rickards, a former member of the Centers for Disease Control Advisory Panel on the Idaho National Laboratory (INEEL), HEPA filters are an unreliable means of controlling radionuclide emissions. The HEPA filter’s failures include alpha migration, re-entrainment of particles, and alpha recoil through multiple filters. Alpha emitters like plutonium may “creep” through four HEPA filters in sequence:

“Alpha recoil” is a DOE term, for the ability of alpha emitters, like plutonium, to “creep” through 4 HEPA filters in a row! Nobody knows how much plutonium comes out of the last filter. We need to make the DOE reveal the plutonium releases for normal operations, in a lab. The DOE has known of this problem since the 1970’s, but has chosen to ignore it. (Letter from Dr. Peter Rickards to US DOE, November 22, 2002)

We question the validity of emission reduction efficiencies of HEPA pollution control devices for all atmospheric emission points at SRS. NRC cannot assure that the plutonium fuel factory will meet NESHAP radionuclide emissions limits.

Contention 1.3: Maximum Achievable Control Technology Is Required.

Basis

The US EPA develops standards for industries which are major emitters of hazardous air pollutants (HAP) that require the application of controls, known as maximum achievable control technology (MACT). According to the plutonium fuel factory license application, the SC DHEC Bureau of Air Quality Air Operating Permit “will be completed approximately 2 years prior to MFFF operations.” However, no MACT has been issued for radionuclides. Therefore, until a health protective measure is in place under Section 112, the NRC must determine the control technology before issuing an operating license. [<http://www.epa.gov/ttn/atw/112g/112gpg.html>]

Contention 1.4: NRC Failed to Assess Emissions Based on Accurate Surplus Plutonium Throughput; Fails to Meet Requirements of Clean Air Act

Basis

The plutonium fuel factory at SRS, if constructed, would have a smokestack, but the full impacts of hazardous air pollution from the plutonium fuel factory have not been assessed in the License Application nor in the EIS.

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 was to have addressed the direct, indirect, and cumulative impacts related to building, operating, and decommissioning the proposed plutonium fuel facility at SRS. According to the EIS, the purpose of the proposed 41-acre plutonium fuel factory is 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 plutonium 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 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, double the amount in the EIS. Notwithstanding the arbitrary and capricious estimate in the ROD, the potential to emit air pollutants for this facility, including radionuclides, should be based on the maximum annual throughput for the licensing period. This is the standard methodology utilized by the federal Clean Air Act Amendments, the US EPA and agreement state environmental 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.

Contention 1.5: The plutonium fuel factory LA does not properly account for the higher levels of morbidity and mortality in females and infants caused by low levels of radiation.

Basis

Cancer mortality caused by ionizing radiation is significantly higher in females than in males. In 2005 the National Academies of Science published BEIR VII, a comprehensive review of all available biological and biophysical data on human exposure to ionizing radiation with a focus on the effects of low-levels of low linear energy transfer radiation such as x-rays and gamma rays. NAS concluded that the evidence supports the linear-no-threshold risk model; i.e., there is no safe level of radiation. Low-LET is defined by the NAS as doses from zero to 100 mSv. BEIR VII also raised its previous estimates of the relative effects of radiation in females; cancer morbidity and mortality rates in females for cancer of the lung, kidney, liver and other solid tumors are double the rate of morbidity and mortality in males with similar exposures.

CONTENTION TWO: ACCIDENTAL RELEASE OF RADIONUCLIDES

Before granting a license to possess and use special nuclear materials, the NRC must determine that the facility will “provide reasonable assurance of protection against natural phenomena and the consequences of potential accidents.” 10 CFR § 70.23(b).

The license application fails to adequately assess consequences of an accidental release of radionuclides from the plutonium fuel factory. The assessment submitted by MOX Services is founded on outdated guidance, invalid models and flawed assumptions.

Contention 2.1: Applicant's method for calculating radiological impacts is founded on outdated guidance

Basis

MOX Services relied on outdated regulatory guidance to calculate radiological impacts of a hypothetical criticality event. MOX Services based its radiological hazard identification of airborne releases from an accident on NRC Guide No. 3.35, data published in 1979 which has been withdrawn by the NRC. [NRC Regulatory Guides - Fuels and Materials Facilities (Division 3), <http://www.nrc.gov/reading-rm/doc-collections/reg-guides/fuels-materials/active>, downloaded 8 May 2007] The NRC document reference states:

Guide No. 3.35 (Withdrawn - See 63 FR 2426, 1/15/1998) (Assumptions Used for Evaluating the Potential Radiological Consequences of Accidental Nuclear Criticality in a Plutonium Processing and Fuel Fabrication Plant, Rev. 1, 07/1979, ML003739504)

Contention 2.2: MOX Services improperly failed to submit an Emergency Plan

Basis

Federal regulation 10 CFR §70.22 requires licensees who use strategic nuclear materials such as plutonium to either develop an emergency plan for responding to accidental releases or to certify that the radiation dose to the public in such an event would not exceed a certain benchmark. MOX Services reported that the risk caused by the release of radionuclides would be negligible.

However, there is substantial risk of emergencies at the plutonium fuel factory because of the presence of dangerous materials in addition to plutonium including large amounts of kerosene, hydrogen, highly toxic and corrosive hydroxylamine nitrate and the unwanted byproduct “red oil.” A letter from ACRS Chairman Wallis to the Commission regarding the plutonium fuel factory construction authorization² detailed the danger.

The relevant federal regulation requires the applicant to submit an emergency plan to NRC if radioactive releases to the public exceeds effective dose equivalent of 1 rem (1000 mrem) or 2 milligrams of soluble uranium. MOX Services provided NRC with an evaluation assessment which includes by reference a summary of its Integrated Safety Analysis (ISAS) for the plutonium fuel factory. (*Mixed Oxide Fuel Fabrication Facility Evaluation Pursuant to 10 CFR 70.22(i)(1)(i)–Emergency Plan Assessment*, dated November 2006) In the ISAS, Duke Cogema Stone & Webster claims to have bounded the potential release of radionuclides in the event of an emergency. DCS has based its analysis on exposure to the IOC claiming it is “more conservative assumption than dose

² Fire hazards at the facility are significant. There are several thousand kilograms of hydrocarbons (nominally kerosene) which are used as solvents in the solvent extraction processes. Hydrogen is used for stoichiometry control in the mixed oxide fuel fabrication. Reactive materials such as hydroxylamine nitrate are used in the process chemistry. Notably, the processes could produce inadvertently the explosive “red oil” in its acid recovery and evaporation processes. Red oil, which is not really an oil and may not be red, is a poorly understood hydrolysis product that has caused damage at plutonium purification facilities operated by the Department of Energy and by others in the world. MF3 can produce red oil in both the “open” and “closed” geometries used at the facility. There is insufficient knowledge to allow red oil and its reactions to be modeled theoretically to determine conditions that avoid explosive reactions. The applicant is undertaking a research program to assess the kinetics of red oil formation and reaction, but significant results are unlikely to be available before design decisions must be made. Therefore, the applicant must rely on the empirical experience with red oil formation and combustion. For the open geometries, DCS has adopted safety standards developed by the Department of Energy. Similar standards are not available for the closed systems. The applicant claims that sufficiently large vents and provision for quenching can be used to control temperatures below 125 °C, which will prevent runaway reactions. The applicant’s technical bases for these conclusions are not clear to us. . . . Fires in moderation-controlled spaces of plutonium facilities have long been a major concern at reactor fuel fabrication facilities. The use of water to suppress fires may initiate a criticality event. Operating experience has shown that fires suppressed by alternative agents (sometimes called “clean agents”), but not cooled, can reignite when air is readmitted. [Letter to NRC Chairman Nils J. Diaz from ACRS Chairman Graham B. Wallis, Re: Review of FSER for MFFF CA Request, 24 February 2005]

to ‘a member of the public offsite.’” (Mixed Oxide Fuel Fabrication Facility Evaluation Pursuant to 10 CFR 70.22(i)(1)(i))

However, the Emergency Plan Assessment suffers from several fatal flaws. First, the air modeling software utilized by the applicant in the Assessment, ARCON96, is not suitable for calculating radionuclide dose to the general public. The ARCON96 model was developed by Pacific Northwest National Labs for calculating dispersion in the area around buildings; e.g. nuclear power plant control rooms. It is a simple Gaussian diffusion model which does not account for temporal or spatial variations in wind. Moreover, the model’s maximum source-receptor distance is 10,000 meters. At the MFF site, the nearest controlled area boundary is 6437 meters from the MFFF and the farthest is 22,530 meters. Therefore, the ARCON96 model cannot be used as a basis for radiation dose outside of the Savannah River Site because it is not valid beyond the boundary of SRS. [*General and Specific Characteristics for Model ARCON96*, page A-35, Office of the Federal Coordinator for Meteorology, http://www.ofcm.gov/atd_dir/pdf/arcon96.pdf]

Second, the Emergency Plan Assessment submitted by MOX Services incorrectly concludes that an emergency plan is not required because chemical and radiological doses to the Individual Outside the Controlled Area Boundary (IOC) are low but the assessment’s analysis of radiological consequences does not bear this out. For example, it shows that fission products krypton, xenon and iodine resulting from a criticality event would result in a Total Effective Dose Equivalent (TEDE) of 868 mrem, 86% of the benchmark for submitting a complete emergency plan.

MOX Services has severely underestimated the possible dose impact to the public. Iodine is a principal health concern because of its impact on the thyroid gland. Table 3 of the Emergency Plan Assessment lists emissions of various isotopes of iodine as follows:

Iodine isotope	Rem
I-131	0.00789
I-132	0.04
I-133	0.0216
I-134	0.142
I-135	0.0204
	0.23189

Here we see that iodine's TEDE is 232 mrem. However, MOX Services (formerly DCS) has not accounted for the true impact of the isotopes of iodine on a target organ: the thyroid. An accurate assessment would utilize Federal Radiological Monitoring and Assessment Center (FRMAC) dose conversion factors to translate the 232 mrem inhalation dose to a 5,430 mrem thyroid dose (5.43 rem). This accurate assessment indicates that the 10 CFR §70.22 threshold of 1 rem required for the development and submission of an emergency plan is exceeded by a factor of five.

CONTENTION 3: EXTENDED ONSITE STORAGE OF RADIOACTIVE WASTE

NOT ADDRESSED IN EIS

The Environmental Impact Statement for the proposed plutonium processing facility [NUREG-1767, *Environmental Impact Statement on the Construction and Operation of a Proposed Mixed Oxide Fuel Fabrication Facility at the Savannah River Site, South Carolina*, (January 2005)] is inadequate to satisfy the requirements of the National Environmental Policy Act and NRC implementing regulations because it fails to

address new and significant information showing that (a) neither the applicant, Shaw AREVA MOX Services, nor the owner of the proposed facility, the U.S. Department of Energy, has any concrete plans for construction or operation of the Waste Solidification Building (“WSB”) that was proposed in the EIS; (b) as a result, high-alpha liquid waste from aqueous polishing process at the proposed facility may have to be stored onsite for an extended period of time; and (c) the extended onsite storage of the high-alpha liquid waste poses environmental and safety hazards that have not been addressed by the NRC in the EIS.

Basis:

In its original application for construction authorization for the proposed plutonium fuel processing plant, former contractor Duke Cogema Stone & Webster proposed a cavalier plan to use the already over-burdened high-level waste tanks at SRS for some 80,000 gallons per year of high-alpha-activity waste containing high amounts of americium. After NWS’s predecessor, GANE, challenged DCS’ proposal in the construction authorization proceeding, the DOE announced it would build a dedicated Waste Solidification Building to convert the high-alpha-activity waste to concrete and ship it to WIPP. (DOE/EIS-20830SA1, *Changes Needed to the Surplus Plutonium Disposition Program, Supplement Analysis and Amended Record of Decision*, U.S. Department of Energy, National Nuclear Security Administration, Office of Fissile Materials Disposition, Washington, D.C. April 2003 at 2-8). The DOE’s plan is also described in the EIS. See EIS at 2-15. The EIS states the waste will be processed to

conform to standards set by the Waste Isolation Pilot Project (WIPP) and then shipped to WIPP in New Mexico.

New and significant information now shows that there is no concrete prospect that the WSB will be built before plutonium fuel processing begins or even that it will be built at all. More than four years have passed since the DOE first announced its plan, and DOE has taken no steps to make that plan a reality. The DOE has not prepared a design for the WSB, nor has it begun to build the WSB. There is no memorandum of agreement or other agreement between the DOE and NRC or MOX Services for the DOE to take the waste.³ There is no information in the license application regarding the WSB, which simply states that “Liquid radioactive wastes are collected in the aqueous liquid waste system or the solvent liquid waste system, and are sent to SRS for disposition. Outside the radiation control area, liquid nonradioactive wastes are collected and sent to SRS for disposition.” (MFFF License Application at 10-2) It goes on to say that “Prior to transfer to SRS, liquid wastes from storage tanks are sampled and analyzed to ensure that waste transfers meet the SRS WAC.” (10-3) Later, it says “Mixed low-level waste and mixed transuranic waste are packaged and transferred to SRS in a manner consistent with the SRS WAC for processing and disposal within 90 days of generation. SRS will take

³ On April 12, 2007, Glenn Carroll attended a public meeting on MOX hosted by the NRC in Aiken, SC. During the question-and-answer session, Ms. Carroll asked about the status of the Memorandum of Understanding between DOE and NRC for the plutonium fuel factory which proposes to process 34 tons of plutonium at Savannah River Site. The response was that the MOU was still not signed. Unlike in previous inquiries since the inception of the MOX licensing process in 2001 where it was acknowledged that NRC was waiting for DOE approval, the respondent (David Tiktinsky, speaking for an unidentified NRC staff person present) indicated that NRC did not believe an MOU was required which implied to Ms. Carroll that an MOU may not even be planned.

possession of the waste prior to reaching the RAB (Restricted Area Boundary) and is responsible for the safe transfer of the waste.” (id.)

Under the circumstances, it must be assumed that the liquid high-alpha waste will have to be kept onsite for an indefinite period. As stated in a letter from the Chairman of the NRC’s Advisory Committee on Reactor Safeguards (“ACRS”) to the NRC Commissioners, the prospect of long-term storage of the liquid high-alpha waste at the facility raises significant environmental and public safety concerns:

MF³ will return waste to the Department of Energy. The facility to receive this waste at the Savannah River site has not been designed, nor have the waste acceptance criteria been established. This raises the possibility that additional unit operations will have to be added to MF³. Perhaps of more importance, the possibility of unplanned interruptions in waste receipt by the Department of Energy needs to be considered in the integrated safety analysis of the MF³ design. It will be necessary to conduct operations at MF³ in a way that assures there is always sufficient waste storage capacity to bring the facility to a safe configuration in the event that waste receipt is interrupted. A protracted hiatus in waste receipt would raise issues of waste aging within MF³. Experience has shown chemical evolutions brought on by evaporation, radiolysis, and other chemical processes can lead to the formation of hazardous chemicals or conditions in wastes awaiting transport to the Department of Energy.

Letter from Graham B. Wallis to Nils J. Diaz, re: “Review of the Final Safety Evaluation Report for the Mixed Oxide Fuel Fabrication Facility Construction Authorization Request” at 5 (February 24, 2005). The EIS contains no analysis of the environmental, safety and public health hazards described in Mr. Wallis’ letter; thus it is inadequate to satisfy NEPA’s requirement to address significant environmental impacts.

The petitioner shares the concerns of the ACRS. History shows there is no basis for confidence in DOE’s track record which shows an inability to resolve its multiple

serious waste issues at SRS. A lack of confidence is exacerbated by these past DOE failures to resolve longstanding waste issues:

- a. There is almost no history or experience of NRC and DOE cooperation or collaboration; DOE has never been subjected to NRC regulation. Under the Ronald Reagan National Defense Authorization Act for Fiscal Year 2005, section 3116 allows DOE to reclassify the 36,000,000 gallons of high-level liquid waste at SRS in 50-year-old leaking underground tanks above the Tuscaloosa Aquifer as “waste incidental to reprocessing.” In this controversial change, which supersedes the Nuclear Waste Policy Act as regards the high-level liquid waste at SRS, the NRC was designated by Congress to consult with DOE in determining alternate disposal plans to accelerate tank closure. This process is ongoing but DOE resistance to NRC input was dramatically, and publicly, displayed in the summer of 2006: the NRC issued NUREG-1854, *Standard Review Plan for Activities Related to U.S. Department of Energy Waste Determinations, Draft Report for Interim Use and Comment* in May 2006⁴; on July 31, 2006, DOE issued a memo strongly objecting to the NRC’s SRP (Docket Nos. PROJ0734, PROJ0735, PROJ0736 AND POOM-32); industry publication Inside Energy reported that DOE had pressured NRC to conduct secret meetings to limit public involvement in its controversial plans to grout and make concrete from the highly radioactive industrial solvents (Inside Energy, August 21, 2006; Inside Energy Extra, August

⁴ The States of Washington, Oregon, New York, and Idaho submitted comments which were generally supportive of the Standard Review Plan (NUREG-1854) with suggestions for correcting factual errors and making its guidelines even more stringent.

- 22, 2006; Inside Energy, August 28, 2006). Spokespeople from the NRC attested that high-level DOE officials had pressured NRC to hold meetings excluding the public to discuss the SRP. (Inside Energy, August 28, 2006, p. 5.)
- b. The high-level tank waste “closure” program has failed on multiple levels over several decades of effort. The wastes contain the fission by-products from processing irradiated reactor fuel to extract plutonium from 1950-1990 at SRS. In 1990 the Defense Waste Processing Facility (DWPF) was constructed to turn the high-level waste into massive glass logs which would be stored onsite until a national geologic repository is built. Failure of the In-Tank Precipitation (ITP) technology to produce a concentrated radiation stream for glassification was brought to light nearly a decade after its 1983 commencement and abruptly stopped because the process generated unacceptably high, and potentially explosive, build-ups of benzene. (See Savannah River Site In-Tank Precipitation Facility Benzene Generation: Safety Implications, Defense Nuclear Facilities Safety Board, Technical Report, June 1997.) Disappointingly, little radiation has actually been converted into glass logs since DWPF came on-line in 1996, and the process is all but halted as the above-mentioned “Sec. 3116” is defined and implemented.
- c. As the DWPF languishes for lack of feed and DOE tests its brand-new authority over the high-level waste, the Salt Waste Processing Facility (SWPF) to separate the cesium-contaminated wastes into high-level and low-level waste streams

- continues to be delayed — originally scheduled to come on-line in 2008, it is now deferred to 2012 (2008 DOE budget).
- d. The so-called low level saltstone vaults at SRS have been leaking since they were first built and cesium has already been detected outside of the vaults. The saga begins in September 1988 in South Carolina Department of Health and Environmental Control (DHEC) records as unanticipated cracks appeared in vault walls and every attempt to patch the cracks increased the rate of cracking in the vault walls while rainwater leakage added to the waste volume (see Permit Modification for Z-Area Disposal Vaults, IWP-217, June 1993). This problem has been well documented, but not resolved to this day, a fact which became prominent in November 2006 public hearings over DHEC issuing a permit to DOE to disposition an additional 3,000,000 to 5,000,000 curies of radiation in saltstone under Sec. 3116. DHEC's permit to DOE is being legally challenged by Natural Resources Defense Council.
- e. SRS and DOE have not established that MOX waste will meet WIPP waste acceptance criteria — the latest DOE TRU waste inventories (2005) acknowledge MFFF waste from SRS (2,640.1 cubic meters of waste) but make no mention of americium (SR-W026-MFFF-1) and the Pit Disassembly and Conversion Facility is mentioned (SR-W026-PDCF-1) showing 1,833.1 cubic meters of waste but “no final form radionuclides.”

The weight of these many longstanding unresolved DOE waste issues should stop the plutonium fuel factory licensing process until Shaw AREVA MOX Services is able to

provide adequate public assurance that plutonium fuel factory waste will not add further insult to the terribly burdensome waste problem already plaguing SRS.

CONTENTION 4: LICENSE APPLICATION FAILS TO ADDRESS

RADIOACTIVE WASTE STORAGE

The license application for the proposed plutonium fuel facility is inadequate because it does not address safety and public health risks posed by indefinite storage of liquid high-alpha waste at the site or contain measures for the safe storage of that waste.

Basis: Petitioners rely on the basis of Contention 3 above for this contention. In addition, they state that there is no indication in MOX Service’s Summary of its Integrated Safety Assessment (“ISA Summary”) (Chapter 5 of the license application) that MOX Services has performed an analysis of the possibility of unplanned interruptions in the receipt of high-alpha liquid waste by the DOE. See Letter from Graham B. Wallis to Nils J. Diaz, re: *Review of the Final Safety Evaluation Report for the Mixed Oxide Fuel Fabrication Facility Construction Authorization Request* (February 24, 2005). There is also no indication in the ISA Summary that MOX Services will “conduct operations at [the MOX plutonium facility] in a way that assures there is always sufficient waste storage capacity to bring the facility to a safe configuration in the event that waste receipt is interrupted.” *Id.*

CONTENTION 5. FAILURE TO ADDRESS IMPACT OF TERRORIST

ATTACKS ON PLUTONIUM FUEL FACILITY AND TRANSPORT

The Final Environmental Impact Statement for the proposed plutonium processing facility is inadequate to satisfy the National Environmental Policy Act

because it does not evaluate the environmental impacts of a terrorist attack on the proposed plutonium fuel factory or transport.

Basis: BREDL and NWS re-submit the contention filed by NWS' predecessor, Georgians Against Nuclear Energy ("GANE") in the plutonium fuel fabrication facility construction permit proceeding in August 2001. They also supplement the contention with new and significant information that further demonstrates the need for an environmental impact statement regarding the environmental impacts of the proposed plutonium fuel factory. As required by 10 C.F.R. § 51.92(1)(2), the NRC must prepare a supplemental EIS to address the impacts of the proposed facility in light of significant new information regarding the potential for a terrorist attack on the facility.

A. Re-Submittal of 2001 Contention.

In support of this contention, BREDL and NWS re-submit NWS's (formerly "GANE's") Contention 12, which GANE submitted to the Atomic Safety and Licensing Board ("ASLB") on August 13, 2001. The ASLB admitted the contention in *Duke Cogema Stone and Webster* (Savannah River Mixed Oxide Fuel Fabrication Facility), LBP-01-35, 54 NRC 403, 446 (2001) ("LBP-01-35"), but the Commission reversed this part of the ASLB's decision in CLI-02-24, 56 NRC 335 (2002) ("CLI-02-24").

The contention reads as follows:

Contention #12. SPD EIS and ER are deficient in their failure to analyze malevolent acts of terrorism and insider sabotage.

GANE contends that a license must not be given for construction and subsequently for operation of a plutonium fuel factory at the Savannah River Site which is situated on the border of Georgia on the Savannah River because it is vulnerable to malevolent acts such as terrorism and insider sabotage which could create an unacceptable beyond design basis accident. DOE did not analyze

terrorism or insider sabotage in its Special Plutonium Disposition Environmental Impact Statement published in 1999. Neither did DCS in its 2000 Environmental Report which, while dismissing out-of-hand as inconsequential many credible scenarios, did not even acknowledge the real possibility of terrorism and insider sabotage (see Section 5.5 of the Mixed Oxide Fuel Fabrical Facility Environmental Report). This deficiency may be terminal to this licensing effort. In any event, malevolent acts must be analyzed as a foreseeable environmental impact under NEPA. Lack of analysis of the malevolent acts scenario leads to failure to design safeguards and failure to plan for emergency response and mitigation measures.

Basis: GANE agrees with the comments submitted by the State of Georgia Department of Natural Resources which raise the specter of malevolent acts and submits them here as substantive to our contention. The following text can be found as submitted on September 21, 1998 by James L. Setser, Chief, Program Coordination Branch of Georgia Department of Natural Resources in DOE's SPD EIS, Comment Response Document, Volume III - Part B at page 162:

Malevolent Acts

Several of the facility incidents discussed in Appendix K of the DEIS, particularly those events for which the initiating event is an "operator error," could also be intentionally initiated by an operator with malicious intent (an informed insider). It is unclear that the analyses presented in this DEIS consider malicious intent as an incident initiator. A knowledgeable operator with malicious intent could disable or bypass systems which normally would be used to detect or mitigate an incident.

The transportation section of the DEIS, Appendix L, dismisses the possibility of malevolent acts with these words ... "[i]n no instance, even in severe cases such as discussed below, could a nuclear explosion or permanent contamination of the environment leading to condemnation of land occur. ... [s]uch attacks would be unlikely to occur ... [o]ther materials, including uranium hexafluoride, uranium oxide, TRU waste and LLW, are commonly shipped, and do not represent particularly attractive targets for sabotage or terrorist attacks".

We disagree with the conclusions drawn in this section of the EIS, and request that DOE perform calculations of the consequences of incidents initiated by malevolent acts, including transportation incidents. Results of these analyses should be classified as appropriate, as recommended by DOE Order 151.1, and incorporated into both this EIS and the Emergency Preparedness Hazard Assessment (EPHA) documents for both TSD and the plutonium facilities.

In its response to the State of Georgia, DOE responded that “[s]abotage scenarios are considered conjecture and not reasonably foreseeable.” DOE goes on to say that “[t]he possibility of sabotage would be controlled through safeguards and security provisions including security requirements associated with facility workers.” DOE’s response concludes that “plutonium disposition facilities would be designed and operated in accordance with DOE Orders 470.1, *Safeguards and Security Program* and 151.1, *Comprehensive Emergency Management System*. The MOX facility ... would be subject to similar NRC requirements.”

It is important to note here, that the CAR is deficient in regards to submitting information regarding the design of its safeguards and security program which weighs in at a mere two pages (Sec. 13). DCS states that it plans to submit the safeguards and security program at a later date, which as shown in the accompanying GANE Motion to Dismiss, is illegal both under NEPA and the NRC’s own Part 70 requirements for licensing.

The State of Georgia states in its internal memo *Critique on DOE Comment Response, Surplus Plutonium Disposition Final Environmental Impact Statement, DOE/EIS-0283*, September 1999, that it remains unconvinced by DOE’s attestation that malevolent acts are not a credible scenario for serious accidents:

DOE is particularly insensitive to our concerns regarding malevolent acts including “insider sabotage,” dismissing them as “conjecture.” By dismissing these concerns, DOE can limit the consequences of spills, transfer errors and similar process upsets by assuming, for the sake of analysis, that all such events can be detected and mitigated within 10 minutes. Despite DOE’s claim that this 10-minute duration does not result in truncation of source term (and reduction in the estimate of onsite and offsite consequences), such truncation does occur for process-related events such as the ones mentioned above.

...

DOE elaborates in Appendix L (pages L-25 & 26) with the following statement: “This section provides an evaluation of impacts that could potentially result from a malicious act on a shipment of hazardous or radioactive material during transportation. In no instance, even in severe cases such as those discussed below, could a nuclear explosion or permanent contamination of the environment leading to condemnation of land occur. Because of the Transportation Safeguards System described in Appendix L.3.2, DOE considers sabotage or terrorist attack on an SST/SGT to be unlikely enough such that no further risk analysis is required.”

We are appalled at DOE's arrogance in this matter. DOE's own policies require the use of the Design Basis Threat (DBT) to determine event consequences and security requirements. DBT includes consideration of an insider as one potential threat vector. Particularly for facility scenarios, we contend that a knowledgeable insider could defeat detection mechanisms.

GANE contends that for the malevolent acts scenario to go unaddressed could lead to dire consequences for the population and natural environment of South Carolina and Georgia. Terrorism scenarios abound in the nightly news. Assault weapons and rocket launchers may be purchased by members of the civilian population not only on the black market but at weapons trade shows. News stories abound of employees at nuclear facilities around the world stealing special nuclear materials, to prove that they CAN or at least that's what they say when caught. However, it is not for the well meaning environmentalists of GANE to contemplate such evil, it is incumbent upon the NRC, DOE and DCS under NEPA that they must put their minds to the problem of safeguarding the world against the special problems posed by ultrahazardous materials such as plutonium. The population and the environment must be protected from terrorism, insider sabotage and theft of materials at every point in transporting and processing plutonium and uranium.

GANE Contentions (August 13, 2001).

B. New Information and Changed Circumstances

In the years before GANE submitted its contention, the NRC had a policy of refusing to consider the environmental impacts of terrorist attacks in EISs because they are not "reasonably foreseeable." See LBP-01-35, 54 NRC at 446, quoting *Limerick Ecology Action v. NRC*, 869 F.2d 719, 729 (3rd Cir. 1989). But the devastating terrorist attacks on the World Trade Center and the Pentagon, which occurred only weeks after GANE filed its contention, showed the policy was no longer viable:

Regardless of how foreseeable terrorist attacks that could cause a beyond-design-basis accident were prior to the terrorist attacks of September 11, 2001, involving the deliberate crash of hijacked jumbo jets into the twin towers of the World Trade Center in New York City and the Pentagon in the Nation's capital, killing thousands of people, it can no longer be argued that terrorist attacks of heretofore unimagined scope and sophistication against previously unimaginable targets are

not reasonably foreseeable. Indeed, the very fact that these terrorist attacks occurred demonstrates that massive and destructive terrorist acts can and do occur and closes the door, at least for the immediate future, on qualitative arguments that such terrorist attacks are always remote and speculative and not reasonably foreseeable.

LBP-01-35, 54 NRC at 446

Recently, the NRC has been given new authority in this area, authority which it should use. In 2004, pursuant to a Presidential Directive, the US Department of Homeland Security (“DHS”) delegated to the NRC certain responsibilities in the event of a nuclear or radiological terrorist incident. These include the provision of technical assistance for source term estimation, plume dispersion, and dose assessment calculations. The DHS has developed a National Response Plan to anticipate threats.

In Homeland Security Presidential Directive (HSPD)-5, the President directed the development of a new National Response Plan (NRP) to align Federal coordination structures, capabilities, and resources into a unified, all-discipline, and all-hazards approach to domestic incident management. This approach is unique and far reaching in that it, for the first time, eliminates critical seams and ties together a complete spectrum of incident management activities to include the prevention of, preparedness for, response to, and recovery from terrorism, major natural disasters, and other major emergencies. [Tom Ridge, Secretary DHS, Preface to National Response Plan, December 2004]

The National Response Plan incorporates emergency management, law enforcement, firefighting, public works, public health, emergency medical services, and other elements to manage domestic incidents. Its protocols:

- Save lives and protect the health and safety of the public, responders, and recovery workers;
- Ensure security of the homeland;
- Prevent an imminent incident, including acts of terrorism, from occurring;
- Protect and restore critical infrastructure and key resources;
- Conduct law enforcement investigations to resolve the incident, apprehend the perpetrators, and collect and preserve evidence for prosecution and/or attribution;

- Protect property and mitigate damages and impacts to individuals, communities, and the environment; and
- Facilitate recovery of individuals, families, businesses, governments, and the environment.

[Federal Radiological Monitoring and Assessment Center (FRMAC) website at http://www.dhs.gov/xprepresp/committees/editorial_0566.shtm, 7 May 2007]

Actions taken by the NRC indicate that the agency may now believe terrorist attacks on nuclear facilities are reasonably foreseeable. See *San Luis Obispo Mothers for Peace v. NRC*, 449 F.3d 1016, 1030-31 (9th Cir. 2006), cert. denied, 127 S.Ct. 1124 (2007) (“*Mothers for Peace*”). In light of these actions, the NRC no longer has a reasonable basis to claim that the environmental impacts of terrorist attacks need not be considered.

In several post-9/11 decisions the Commission announced that, as a matter of law, it would never consider the environmental impacts of terrorist attacks in its licensing decisions. See, for example, *Pacific Gas and Electric Co. (Diablo Canyon Independent Spent Fuel Storage Installation)*, CLI-03-01, 57 NRC 1 (2003); *Private Fuel Storage, L.L.C. (Independent Spent Fuel Storage Installation)*, CLI-02-25, 56 NRC 340 (2002). But the Ninth Circuit found the NRC’s position to be unreasonable in every respect in the *Mothers for Peace* decision. Recently, the NRC Commissioners announced that they will disregard the Ninth Circuit’s decision in any other location but the Ninth Circuit. (License Renewal Proceeding for Oyster Creek Nuclear Generating Station, Amergen Energy Company, L.L.C CLI-07-08 (February 26, 2006))

Petitioners respectfully submit that the Commission's policy is unreasonable. For all the same reasons given by the Ninth Circuit in *Mothers for Peace*, Petitioners ask the Commission to reconsider its position and admit their contention.

CONCLUSION

For the foregoing reasons, the petition and contentions should be admitted and a hearing granted.

Respectfully submitted this 14th day of May, 2007

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