

Public Comments For:

GOVERNOR'S NUCLEAR ADVISORY COUNCIL MEETING

Meeting Date: March 14, 2013

Submitted by:

Tom Clements



Summary of Comments to the South Carolina Governors Nuclear Advisory Council

Tom Clements Southeastern Nuclear Campaign Coordinator Friends of the Earth Columbia, SC

March 14, 2013

Thank you for this opportunity to submit these comments to the Nuclear Advisory Council.

German High-Level Waste

The possible import to the Savannah River Site of liquid high-level waste from Canada's Chalk River Lab -material which should be left to Canada to manage -has drawn attention. A Supplemental Environmental Impact Statement (SEIS) must be prepared on that odd shipment and a number of public interest groups have made that request of the Department of Energy's (DOE) Office of National Environmental Policy Act (NEPA Policy and Compliance

On the heels of the Canadian proposal, DOE is considering importation of high-level waste from the AVR gas-cooled reactor located in Juelich, Germany. This reactor was an experimental energy-production reactor (not a research reactor, as has erroneously been claimed by DOE) which used fuel which contained some US-supplied highly enriched uranium (HEU).

Under the direction of the DOE's Global Threat Reduction Initiative (GTRI), the Office of Environmental Management is analyzing disposal options for 250,000 carbon fuel "pebbles," now stored in over 250 casks. This material is high-level waste and should be managed as such in Germany. If brought to SRS, this material likely cannot be reprocessed and would only add to the high-level waste burden at the site. The spent fuel poses little proliferation risk and must be left in Germany for management. If import into the US is considered, a full Environmental Impact Statement is needed.

Mixed Oxide Fuel Problems

Rumors from government officials continue about the state of affairs of the troubled MOX program. It appears that MOX may well face a 75%

cut in the upcoming DOE budget request for Fiscal Year 2014 - possibly coming on April 8. As it now stands, it is possible that the MOX program could be terminated now that the roof of the facility at the Savannah River Site (SRS) is being completed and given that funds are not available for the project to be funded at ever-higher levels.

Given the huge cost overruns and gross mismanagement of the program, it is advised that the Nuclear Advisory Council write a letter to DOE concerning who will be held accountable for the MOX debacle. Peter Hanlon, DOE's Assistant Deputy Administrator for the National Nuclear Security Administration's Office of Fissile Material Disposition, (NNSA/NA-26) and Kelly Trice, president and chief operating officer of Shaw AREVA MOX Services, LLC, may well have been irresponsible in their lack of control of huge cost overruns and schedule delays with the MOX project.

Will DOE hold anyone accountable for the stunning failure of the MOX project, which has wasted billions of tax payers' dollars with no results? The waste is less than the failed Yucca Mountain project but is yet another example of DOE's inability to manage costly, complicated construction projects.

Wrong Approach: Spent Fuel Storage and Reprocessing at the Savannah River Site

Concerning the proposal to bring a large quantity of highly radioactive spent fuel to the Savannah River Site for reprocessing, as proposed by the 5R5 Community Reuse Organization (SRSCRO), I have the following comments.

- Who paid for the document, reported to be \$200,000? Was this paid for a reprocessing company such as AREVA, which would stand to profit off the federal government if reprocessing were implemented?
- The document by the SRSCRO totally ignores the cost of a reprocessing plant and who will pay for it. AREVA, according to the attached article, estimates a reprocessing plant in 2011 to be \$25 billion. The U.S. Department of Energy, in a 2009 presentation (see attached) estimated a reprocessing plant to cost more than \$15 billion. Additionally, the life-cycle costs of operating a single reprocessing plant are ignored. The life-cycle cost of the \$20-billion Japanese reprocessing plant Rokkasho -which has not been able to start after five years of trying -is estimated to be on the order of \$140 billion.
- The SRSCRO ignores that there is no current or anticipated demand for any plutonium that would be removed via reprocessing from the 47,000 metric tons they aim to bring to SRS. There would simply be no demand by nuclear utilities for this weapons-usable plutonium and no reactors in which to use any plutonium fuel.
- The SRSCRO ignores the myriad of waste streams arising from reprocessing, many of which would have to be disposed of on site. Bringing

spent fuel to SRS for reprocessing could turn SRS into a de facto Yucca Mountain mega-dump for nuclear waste, which will not be acceptable to the people of South Carolina.

- According to the Environmental Impact Statement for the Private Fuel Storage Facility for spent fuel storage facility in Utah -the NRC license for which has been withdrawn -it is stated that only "approximately 45 jobs" would be created during operation of the facility. Thus, there would be an insignificant jobs impact to South Carolina. (See extracts from the EIS attached.)

- AREVA has revealed in an October 23, 2012 email message to the Nuclear Regulatory Commission that it intends to pursue licensing of a reprocessing plant in 2019. (See email attached). This is totally unrealistic but reveals that AREVA is anxious to try and put reprocessing in place, with the hope of making a large profit.

- EnergySolutions, in a January 10, 2013 memo to the NRC, tipped its hand in revealing that it thinks spent fuel storage and reprocessing are linked. That memo, which is attached, stands as a warning to South Carolina -that if a spent fuel storage facility is sited here then the real goal is to reprocess the spent fuel at such a facility.

- The DOE's ***Strategy for the Management and Disposal Of Used Nuclear Fuel and High-Level Radioactive Waste*** - see excerpt of the January 11, 2013 report attached -clearly states that the so-called "once-through" fuel cycle will remain in place for the next few decades," underscoring no ability of need to reprocess spent fuel.

- Finally, a February 2013 document produced by the DOE labs -***Categorization Of Used Nuclear Fuel Inventory In Support Of a Comprehensive National Nuclear Fuel Cycle Strategy*** - clearly states that there is no need to retain the current inventory of spent fuel for reprocessing. This is the very inventory on which the SRCRO's flawed report is based. This conclusion by the DOE labs renders the SRCRO's advocacy of reprocessing at SRS to be little more than an exercise which will never be put in place.

On February 28, 2013, a public dialogue in Aiken on whether to bring spent fuel to SRS was begun by the public interest group **Don't Waste Aiken** (<https://www.facebook.com/DontWasteAiken>). A full house gathered to discuss the wisdom of bringing spent fuel to SRS for storage and reprocessing and there was great concern expressed about not giving consent to such a proposal.

Don't Waste Aiken and other groups in South Carolina will continue to lead the public discussion about not consenting to spent fuel storage and reprocessing in South Carolina.

Thank you for this opportunity to submit these comments.

Areva sees US nuclear waste recycling planning by '15

Mon Jun 6, 2011 3:56pm EDT

- * Areva in talks with US utilities to advocate for center
 - * Would take 10 years to build waste recycling plant
 - * Japan's nuclear crisis has renewed interest in recycling
- (Adds details about cost of recycling center, paragraph 10)

By Ayesha Rascoe

WASHINGTON, June 6 (Reuters) - Areva ([AREVA.PA](#)) hopes that by 2015, it can start planning construction of a facility for recycling nuclear waste in the United States, an executive for the French nuclear power company said on Monday.

Jacques Besnainou, head of Areva's North American unit, said the company was in discussions with several utilities about forming an alliance to advocate for a recycling center.

"We're hopeful that we can start planning for such a facility by 2015," Besnainou told reporters at a briefing held by The Energy Daily, a trade publication.

Once planning began, it would take about 10 years to get a facility up and running, he said.

Interest in nuclear waste recycling has grown since Japan's nuclear crisis exposed the dangers of storing waste at power plants indefinitely, Besnainou said.

"One of the things we're discovering in Fukushima is leaving used fuel in ... a spent fuel pool may not be a very wise decision," he said.

Efforts to regain control of Japan's Fukushima Daiichi nuclear complex have been hampered by the overheating of pools containing spent fuel.

KICK THE CAN DOWN THE ROAD

There is no law against building a nuclear recycling center in the United States, but Besnainou said the Nuclear Regulatory Commission would need to devise regulations for a facility.

He said it would help if the United States created an agency focused on handling nuclear waste that could help fund and plan a recycling center.

Areva has said it would cost about \$25 billion to build a recycling center in the United States. Besnainou suggested part of the funding for the project could come from the federal government's Nuclear Waste Fund, which brings in about \$750 million in fees annually from U.S. ratepayers. *

The United States has no permanent storage site for nuclear waste. The Obama administration shelved the long-delayed Yucca Mountain, Nevada spent fuel dump. The Yucca Mountain waste dump was opposed by Nevada residents but supported by Republicans and lawmakers from states holding significant amounts of nuclear waste.

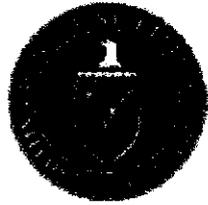
Besnainou said a recycling center would be preferable to developing interim storage sites, such as those being considered by the Obama administration's Blue Ribbon commission on nuclear waste. [ID:nN13248241]

"When you do a recycling center, you're being part of the

solution. You're taking care of the fuel, you're making the fuel less dangerous," Besnainou said. "Interim storage is kicking the can down the road."

The amount of used fuel left over after recycling is much less than the United States must manage now, and having a recycling center would delay the need to decide on a permanent storage site by at least 50 years, Besnainou said.

(Editing by Dale Hudson and David Gregorio)



**U.S. DEPARTMENT OF
ENERGY**

Nuclear Energy

DOE Perspective on Advanced Nuclear Fuel Cycles

**Presentation to
US NRC Regulatory Information Conference
Bethesda, MD**

**Buzz Savage
Office of Nuclear Energy
U.S. Department of Energy**

March 11, 2009



Cost

-
- **A transition to a closed fuel cycle would be expensive and take several decades**
 - a commercial scale reprocessing plant could cost >\$15 billion ✱

 - **Business case for an integrated fuel management approach**
 - Industry estimated that a waste fee between 1 – 3 mils/kWh would be needed

 - **R&D and innovative technology could significantly reduce costs**
 - Simplified/compact systems, advanced materials
 - Improved design processes, reduced conservatism

Final Environmental Impact Statement

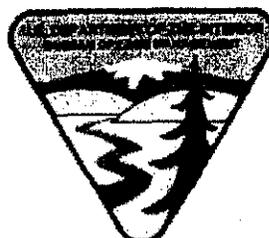
for the Construction and Operation of an
Independent Spent Fuel Storage Installation
on the Reservation of the Skull Valley Band
of Goshute Indians and the Related Transportation
Facility in Tooele County, Utah

Docket No. 72-22
Private Fuel Storage, L.L.C.

U.S. Nuclear Regulatory Commission
Office of Nuclear Material Safety and Safeguards

U.S. Bureau of Indian Affairs
U.S. Bureau of Land Management
U.S. Surface Transportation Board

December 2001



propose be required with respect to grazing resources are set forth below under "Mitigation Measures."

Beneficial effects of the proposed action on the local economic structure would result from the creation of approximately 255 jobs during the peak of construction and approximately 45 jobs during PFSF operation. Many of these jobs are likely to be filled by workers from Tooele County or from other counties within commuting distance, as well as by local members of the Skull Valley Band. In addition to jobs, it is expected that construction and operation of the proposed PFSF would result in increased business for the Pony Express Convenience Store on the Reservation and for other businesses and suppliers in the area. Also, there would be a large benefit to the Skull Valley Band in the form of lease payments and additional employment opportunities for the duration of the lease. *

Additional beneficial impacts on the economic structure of the impact area during the operational life of the proposed PFSF include state sales tax payments, incentive payments to Tooele County, local payroll, and other local expenditures. Payments to Tooele County have been estimated to be \$91.2 million over the life of the PFSF (based on a proposed agreement negotiated between PFS and the County) (PFS/RAI2 1999). Local payroll during operation of the proposed PFSF has been estimated to be \$81 million (based on PFS's estimate of the number of positions and anticipated pay for each position, including benefits) (PFS/RAI2 1999). Other local expenditures, including operations support and utilities, have been estimated to be \$79 million (based on PFS's estimate of the number of personnel involved, and utilities based on the number of buildings and the estimated utility load for these buildings) (PFS/RAI2 1999). In addition, steel liners for the storage casks would be fabricated in the Salt Lake City or Tooele County area over a period of approximately 21 years and shipped by truck to the site on the Reservation, where they would be filled with concrete from the batch plant; the average number of weekly shipments to the site would be four (or 200 per year). The construction of casks and canisters has been estimated to be worth \$747 million (PFS/RAI2 1999). The direct and indirect benefits of cask and liner construction would accrue to whatever jurisdiction hosts their manufacture.

In addition to impacts to the local economic structure, operation of the proposed PFSF would result in off-Reservation sales tax payments to the State of Utah, estimated to be \$53.5 million (based on PFS's review of the Utah tax structure) over the life of the proposed PFSF (PFS/RAI2 1999).

Cultural Resources

Based on the results of a thorough ethnographic and historic literature review, an intensive field cultural resources survey of the proposed PFSF site, and consultation process as required by Section 106 of the National Historic Preservation Act (NHPA), potential impacts to archaeological and historical resources from construction of the proposed PFSF are considered to be small. During the consultation process with the Skull Valley Band, other regional Federally Recognized Indian Tribes and other organizations, no traditional cultural properties have been identified within the project area. Construction of the new rail line along the western edge of Skull Valley would have small to moderate impacts. Some historic properties identified in the area of potential effect (APE) would be adversely affected. The most significantly adverse effect would be destruction of a small portion of the Hastings Cutoff of the California Trail, which the proposed rail line crosses at approximately a right angle. The NRC and Cooperating Agencies have developed—in consultation with the designated Utah SHPO, PFS, the Advisory Council on Historic Preservation, and other consulting parties—a draft Memorandum of Agreement (Agreement) and treatment plan for the cultural resources that could be

From: [BADER Sven \(AREVA\)](#)
To: [Faraz Yawar](#)
Cc: [Guttmann, Jack](#); [Mahula, Thomas](#); [DAVIDSON Dorothy \(AREVA\)](#); [JONES David \(AREVA\)](#); [MURRAY Paul \(AREVA\)](#); [SALAS Pedro \(AREVA\)](#); [LEVIN Alan \(AREVA\)](#); [LUCAS Matthieu \(AREVA\)](#); [BAILLY Frederic \(AREVA\)](#); [PRUD HOMME Pascal \(AREVA\)](#)
Subject: RE: Request for input for Commission paper on reprocessing
Date: Tuesday, October 23, 2012 5:32:25 PM

Yawar,

You may publicly release the below text.

Sven

NRC:

As you may have heard, an AREVA-led team recently was selected by the Eddy Lea Energy Alliance (ELEA) as their commercial partner to begin developing the concept of a Used Nuclear Fuel (UNF) Consolidated Storage Facility (CSF) in southeastern New Mexico. AREVA has spoken to other communities that may come forward in the future to offer hosting a CSF, but what our agreement with ELEA ultimately indicates is AREVA's belief that consolidated interim storage of UNF (as recommend by the Blue Ribbon Commission on America's Nuclear Future) will be an important first step in moving towards a resolution of issues associated with the back-end of the nuclear fuel cycle in the U.S. However, a CSF by itself does not accomplish an end goal (e.g., Waste Confidence). If a CSF were combined with recycling and ultimately with a repository, then there is an assurance to any State and local community willing to "consent" to host a CSF that the CSF will not become a de facto repository for UNF. So why does AREVA include recycling in this scheme? Because AREVA sees many common elements between a CSF and a recycling facility (e.g., a receipt facility for UNF, a temporary storage location for UNF, and potentially dry and/or wet UNF transfer areas and an R&D facility) and AREVA believes that a recycling facility would also provide multiple benefits to a repository (e.g., providing a stable waste form ready for disposal in most media and reducing the ultimate volume of waste requiring disposal). Furthermore, AREVA believes (unless Yucca Mountain is restarted) that the horizon for a repository in the U.S. (based on historical evidence) is likely much further out than that for a recycling facility. Hence a recycling facility could incentivize the nearer term movement towards a back-end solution through the added benefits of providing a local community willing to host such a facility significant economic development and job creation (well beyond those associated with just a CSF), while waiting for the siting studies, selection process, licensing process, and design and building processes of a repository to mature. These are only a few reasons why AREVA supports recycling and we would welcome the opportunity to share others with you.

AREVA's plan is to submit a license application for a recycling facility in 2019. To meet this date, AREVA will require rulemaking for a recycling/reprocessing facility to be completed in the 2017 to early 2018 timeframe. AREVA remains committed to supporting the NRC recycling rulemaking activities, which we believe have shown significant progress over the last year (with the release of the draft Regulatory Basis, the responding SRM from the Commissioners, and the recent release of the ETR). AREVA understands the constraints the NRC is under (considering budget limitations and

issues associated with Waste Confidence and lessons learned from Fukushima), but we believe the progress shown to date, even with the limited resources available to the Staff, does show meaningful progress towards a final rule and AREVA supports the NRC's continued effort towards completing this rulemaking activity.

Please do not hesitate to contact me for further elaboration on this matter or, if you would like, AREVA could meet with you to discuss this topic further. We hope that the NRC continues its effort on this rulemaking activity and thank you for your continued progress on this activity.

Sincerely,
Sven

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EnergySolutions' Statement to the Nuclear Regulatory Commission on Reprocessing and the Disposition of Used Nuclear Fuel

EnergySolutions has the experience and capabilities to handle, store, reprocess and dispose of used nuclear fuel (UNF). We are very keen to continue to take an active part in the Blue Ribbon Commission's (BRC) recommended path forward, including the setting up of one or more Consolidated Storage Facilities for UNF in the USA, and also the pursuit of UNF reprocessing.

We are currently contracted with DOE to carry out several studies related to the BRC recommendations, including producing design concepts for one or two CSFs, and the development of standardized transportation, aging and disposal canisters for UNF. We strongly support the setting up of one or more CSFs in the USA and the progressive movement of UNF from the shutdown and operating reactor sites to these CSFs. Our CSF design concepts study first looked at UNF transportation issues from both shutdown and operational sites, the need for repackaging some UNF prior to transport, the difficulties with transport access to certain shutdown sites, the lead time to acquire suitable cask and railroad cars, and the licensing requirements for all equipment and transport methods. It went on to identify, cost and compare 6 options, covering one or two CSFs, differing UNF receipt rates, UNF pickup orders, operational start dates and geological repository operational dates. These scenarios were illustrative only at this stage but the model we developed enables all possible options to be compared and provides the basis for production of a full conceptual design.

EnergySolutions supports the reprocessing of UNF in the USA because it (i) minimizes the volume of high level waste (HLW) that ultimately will require geologic disposal, (ii) provides a vitrified HL Waste form that is more robust than irradiated nuclear fuel assemblies that were not originally designed for long term storage, and (iii) enables the removal from the HLW of long-lived heat emitting transuranics such as americium so that these can be separately destroyed. During the Global Nuclear Energy Partnership (GNEP) period we produced a conceptual design, technology roadmap and business plan for a UNF reprocessing facility capable of reprocessing 1500 MT of UNF per year and future expansion up to 3000 MT/year. During that period we actively engaged with the NRC on its gap analysis of the regulatory framework for analyzing a reprocessing facility. We support the continuation of that process and ultimately a rulemaking for the creation of a Part 7X. At the end of the GNEP period our conceptual design provided all that was required for an immediate move into the detailed design process.

We believe there are significant synergies between a CSF and a reprocessing facility. Each requires a receipt facility and temporary storage for the UNF, a hot cell or pool facility for the removal of UNF from canisters so that it can be reprocessed or re-packaged for repository storage, and an R&D facility. Establishing a CSF and a reprocessing plant on the same site would allow economies to be realized by the common use of these facilities. Such a combined site would also potentially be more attractive than a standalone CSF to a prospective host community because of the much larger range of high quality jobs that it would offer. This could help the identification of volunteer communities for such a site, as recommended by the BRC. EnergySolutions is actively engaged with potential host communities for a CSF and we believe that the CSF will ultimately be tied to a Reprocessing Plant, an R&D facility and, potentially also the Geologic Repository.

Chris Phillips
January 10, 2013

http://energy.gov/sites/prod/files/2013%201-15%20Nuclear_Waste_Report.pdf

STRATEGY
FOR THE MANAGEMENT
AND DISPOSAL
OF USED NUCLEAR FUEL AND
HIGH-LEVEL RADIOACTIVE WASTE



JANUARY 2013

Disposal of defense wastes alongside commercial wastes is the current policy in accordance with the 1985 decision to use a single repository for both commercial and defense wastes. The issue of "commingling" of wastes in a repository will be the subject of analysis moving forward.

Advanced Fuel Cycles

The BRC concluded that "it is premature at this point for the United States to commit irreversibly to any particular fuel cycle as a matter of government policy..." and pointed out that "it is... very likely that disposal will be needed to safely manage at least some portion of the existing commercial [used nuclear fuel] inventory." Even if a closed fuel cycle were to be adopted in the future, permanent geologic disposal will still be required for residual high-level radioactive waste. Cost, nonproliferation, national security, environmental concerns, and technology limitations are some of the concerns that would need to be addressed before any future decision to close the U.S. fuel cycle through the use of recycling would be made. These factors reinforce the likelihood that the once-through fuel cycle will continue at least for the next few decades. Nevertheless, consistent with past practice and the BRC's recommendations, DOE will continue to conduct research on advanced fuel cycles to inform decisions on new technologies that may contribute to meeting the nation's future energy demands while supporting non-proliferation and used nuclear fuel and high-level radioactive waste management objectives. *

International Cooperation

International cooperation has been a cornerstone of both U.S. fuel cycle R&D efforts as well as actions to reduce the global proliferation of nuclear materials. Recently, several countries, led by the U.S. and others, have come together to establish frameworks within which multi-national fuel cycle facilities could enable wider access to the benefits of nuclear power while reducing proliferation risks. The BRC recommended that the U.S. develop the capability "to accept used fuel from foreign commercial reactors, in cases where the President would choose to authorize such imports for reasons of U.S. national security." The focus of the present Strategy is on a clear path for the safe and permanent disposal of U.S. used nuclear fuel and high-level radioactive waste; however, the Administration will continue to evaluate the BRC's recommendation and will discuss with Congress the pros and cons of including it in the new waste disposal program.

Implementation

Critical elements for successful implementation of this Strategy include the establishment of a consent-based siting process, a new organization to execute the waste management mission and implementation of a process for long-term, stable funding. The design of both the new organization and the funding source should strike an appropriate balance between independence of the new organization and the need for oversight by Congress and the Executive branch.

WM2013 Conference, February 24 – 28, 2013, Phoenix, Arizona USA

Categorization of Used Nuclear Fuel Inventory in Support of a Comprehensive National Nuclear Fuel Cycle Strategy - 13575^a

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*****Savannah River National Laboratory

ABSTRACT

A technical assessment of the current inventory [~70,150 metric tons of heavy metal (MTHM) as of 2011] of U.S.-discharged used nuclear fuel (UNF) has been performed to support decisions regarding fuel cycle strategies and research, development and demonstration (RD&D) needs. The assessment considered discharged UNF from commercial nuclear electricity generation and defense and research programs and determined that the current UNF inventory can be divided into the following three categories:

1. Disposal – excess material that is not needed for other purposes;
2. Research – material needed for RD&D purposes to support waste management (e.g., UNF storage, transportation, and disposal) and development of alternative fuel cycles (e.g., separations and advanced fuels/reactors); and
3. Recycle/Recovery – material with inherent and/or strategic value.

A set of key assumptions and attributes relative to the various disposition options were used to categorize the current UNF inventory. Based on consideration of RD&D needs, time frames and material needs for deployment of alternative fuel cycles, characteristics of the current UNF inventory, and possible uses to support national security interests, it was determined that the vast majority of the current UNF inventory should be placed in the Disposal category, without the need to make fuel retrievable from disposal for reuse or research purposes. Access to the material in the Research and Recycle/Recovery categories should be retained to support RD&D needs and national security interests. This assessment does not assume any decision about future fuel cycle options or preclude any potential options, including those with potential recycling of commercial UNF.

INTRODUCTION

This paper summarizes a recent technical assessment of the current inventory of U.S. domestic-discharged used nuclear fuel (UNF) in support of a comprehensive national nuclear fuel cycle strategy.[1]

^aNotice: This manuscript has been authored by UT-Battelle, LLC, under contract DE-AC05-00OR22725 with the U.S. Department of Energy. The United States Government retains and the publisher, by accepting the article for publication, acknowledges that the United States Government retains a non-exclusive, paid-up, irrevocable, worldwide license to publish or reproduce the published form of this manuscript, or allow others to do so, for United States Government purposes.

The assessment was performed for the Department of Energy Office of Nuclear Energy's (DOE-NE) Fuel Cycle Technologies (FCT) program and is intended to support near-term and future decisions regarding fuel cycle strategies and research, development and demonstration (RD&D) needs. The objective of the assessment is to determine if the domestic UNF inventory can be separated into different, distinguishable categories relative to disposition options and, if so, to quantitatively differentiate the UNF inventory relative to the defined categories. This assessment is motivated by the recognition that characterization and categorization of the domestic UNF inventory can inform decisions relative to domestic disposition options and UNF management. For example, if a certain fraction of the UNF inventory is determined to be excess material that is not needed for other purposes, that information can clarify needs for geologic disposal, such as capacity and retrievability, as well as impact how and where that material is handled and stored in the future. Alternatively, if a certain fraction is determined to be needed for a future use such as recycling, that knowledge can clarify needs for future reprocessing facilities, such as capacity and other facility characteristics, as well as how and where the UNF is handled and stored, including the importance of fuel assembly integrity and retrievability. The scope of this assessment includes the current (as of 2011) inventory of discharged UNF from commercial nuclear electricity generation and defense and research programs.

The current inventory of domestic UNF is massive, diverse, dispersed, and increasing. Although the UNF inventory has been and continues to be managed safely, it represents a significant financial liability. The two principal options for addressing UNF management are geologic disposal and recycling, which also requires geologic disposal for resulting high-level waste. Given the current mass [~70,150 metric tons of heavy metal (MTHM)] and diversity of the domestic UNF inventory and the fact that U.S. commercial nuclear power plants are discharging ~2,000 MTHM annually, it is difficult to conceive a realistic or financially viable alternative nuclear fuel cycle in which the current inventory would need to be retained for reuse. On the other hand, geologic disposal of the entire current inventory would reduce and potentially eliminate access to UNF that may be needed to support UNF management and alternative fuel cycle RD&D. Therefore, the focus of this assessment is on the determination of the characteristics and amounts of UNF that should be retained for potential future use and those that should be designated for disposal.

The assessment approach includes the following:

1. Collection and analysis of current and projected UNF inventory data;
2. Assessment of the UNF inventory relative to retention needs for RD&D, potential future recycle, and national security interests;
3. Determination of appropriate categories and criteria for categorizing the UNF inventory; and
4. Categorization of the UNF inventory relative to the identified categories.

Key tenets and assumptions include the following.

1. Access to some amount of UNF is needed to support RD&D for the DOE-NE FCT program objectives related to UNF management and alternative fuel cycles.
2. The two principal options for addressing UNF management are geologic disposal and recycling.
3. U.S. nuclear power plants will continue to discharge ~2,000 MTHM annually for the next couple of decades; projections beyond the next couple of decades are less certain.
4. The option of recycling commercial UNF at a future date is maintained, pending a decision.

5. Although fuel recycling depends on future decisions, it is assumed that industrial-scale (100s to 1000s of MTHM/y) recycling of commercial UNF is unlikely to begin for at least 20 years (2030 time frame), at which time an additional ~40,000 MTHM of UNF will have been discharged.
6. Recycling in any potential future alternative fuel cycle would likely be designed and optimized for the material needs of the associated reactor fleet based on the current and projected UNF discharges and inventory at that time, rather than UNF feedstock that is no longer being produced.
7. The time frame for the development of alternative fuel cycles is assumed to be consistent with the schedule in the DOE-NE R&D Roadmap.[2]
8. It is assumed that the transportation and placement of the current UNF inventory in disposal is unlikely to begin for at least 10 years and will take several decades.

A description of the assessment of the UNF relative to retention needs, criteria for UNF categorization, and results of the categorization are discussed below.

OVERVIEW OF U.S. USED NUCLEAR FUEL INVENTORY

The current inventory of domestic UNF is massive, diverse, dispersed, and increasing. Approximately 67,600 MTHM of commercial UNF, representing a total of ~23 billion curies of long-lived ← radioactivity,[3] ~2,500 MTHM of DOE-owned UNF, and ~50 MTHM of highly enriched uranium (HEU) UNF that is greater than 90 wt % ²³⁵U are currently stored at 79 sites in 34 states.[4, 5] The commercial UNF inventory is currently increasing annually by ~2,000 MTHM [4] and will increase at a greater rate in the future if the number of operating nuclear reactors increases. Commercial UNF discharge data, on an assembly basis, were collected and published [6] by the Energy Information Administration for the Office of Civilian Radioactive Waste Management through 2002. Although limited to discharges through 2002, these data represent the most detailed available information on the commercially discharged UNF inventory. More recently, data have been assembled from a variety of sources by the DOE-NE Used Fuel Disposition Campaign (UFDC) to develop an inventory estimate through 2011.[3] Data from both of these sources were used in this assessment.

Commercial nuclear power plants have been operating in the United States since 1957,^a and there are currently 104 operating nuclear power plants. Used nuclear fuel from these plants is stored on-site in spent fuel pools and in dry storage casks, complicating the cost and issues associated with UNF management. Dry storage facilities, referred to as independent spent fuel storage installations (ISFSI), are in operation at the majority of reactor sites, including 10 sites in 9 states that no longer have operating reactors. Commercial UNF includes irradiated fuel discharged from pressurized water reactors (PWRs) and boiling water reactors (BWRs). In 2011, ~74% of the total mass of commercial UNF was stored in spent fuel pools, and the remaining 26% was in dry cask storage.[7] However, these proportions will slowly change [7, 8] as most spent fuel pools are at or near their capacity. The distribution of the current UNF inventory from PWRs and BWRs in wet (pool) and dry storage is illustrated in Fig. 1.

^aNote that the UNF from the first commercial nuclear power plant, the Shippingport Atomic Power Station, is now classified as DOE-owned fuel.

Public Comments For:
GOVERNOR'S NUCLEAR ADVISORY COUNCIL MEETING
Meeting Date: March 14, 2013

Submitted by:

Lisa Darden

Gov. Nuclear Advisory Council meeting March 14, 2013 Interim Storage of SNF

I'm worried that if Aiken is chosen as an interim storage site for spent nuclear fuel (SNF) it will actually become a permanent storage site for SNF. Interim storage as defined by the federal government is any amount of time up to 100 years. So obviously anything "interim" is potentially permanent to Aiken and permanent to South Carolina. SRS has a long history already of being behind schedule and over budget. Yet the design and construction of mid-1900 storage facilities at SRS are already moving beyond their intended use and time frame. We've all watched job cuts and then rehiring at SRS, it happens all the time. Using Aiken as a site would also likely involve hundreds to thousands of shipments of dry canisters endangering our roadways, cities, homes and businesses.

According to the U.S. Government Accountability Office in 2011, spent nuclear fuel is **"considered one of the most hazardous substances on earth."**

The risk of a shipping disaster is too great. Nuclear waste is best stored on the site where it is produced, according to Robert Alvarez.

On Feb. 28th, Mr. Alvarez came to speak to over 100 concerned Aiken citizens. Mr. Alvarez is a Senior Scholar at the Institute for Policy Studies in Washington D.C. and an Adjunct Professor at the Johns Hopkins School of Advanced International Studies. He is considered one of the nation's experts on civilian and military nuclear programs.

Between 1993 and 1999, Mr. Alvarez served as Senior Policy Advisor to the U.S. Secretary of Energy. While in DOE, he led U.S. teams into North Korea in 1994 and 1995 to secure spent reactor fuel at the Yongbyon nuclear site, was responsible for strategic nuclear material and asset management policies, and led the DOE's successful effort to establish a federal compensation program for sick nuclear weapons workers. He received two Secretarial Gold Awards.

In his talk, he told us his perspective on the value of leaving SNF where it is and the problems associated with moving it and storing it elsewhere. According to spent nuclear fuel data from the Nuclear Energy Institute, the amount of intermediate and long-live radioactivity from these wastes is more than twice that already stored at SRS from military reprocessing high-level radioactive wastes. SRS has the largest concentration of these wastes in the U.S. and is, I repeat, behind schedule and overbudget in dealing its own high-level radioactive wastes. According to Mr. Alvarez, even if a geological repository were to open, SNF stored at SRS would likely remain there for decades to come. SNF storage from power plants will be needed for at least 100 years.

Leave spent nuclear fuel where it is and build dry cask storage. The National Academy of Sciences has concluded that dry-cask storage offered several advantages over pool storage. Dry-cask storage is a passive system that relies on natural air circulation for cooling, rather than requiring water to be continually pumped into cooling pools to replace water lost to evaporation caused by the hot spent fuel.

Also, dry-cask storage divides the inventory of spent fuel among a large number of discrete robust containers, rather than concentrating it in a relatively small number of pools. Mr. Alvarez told us that if built into German style bunkers it is far less susceptible to terrorist attack or geological disasters than the pool storage.

The summary of Mr. Alvarez's analysis and opinion is that -

- spent nuclear fuel is dangerous to plant, animal and human life
- spent nuclear fuel is best kept where it is
- Spent nuclear fuel is capable of being stored safely and cost effectively in dry casks using methods that have been perfected in Germany

After watching repeated lay offs and rehires at SRS and the budget problems in Washington, I don't believe the government is able to complete a so called interim project. It will remain a costly project that will have no end. Here at SRS, After more than 25 years, DOE has processed less than about 11 percent of radioactivity in SRS wastes. Our own CAB states: *"The Plutonium Disposition Program should also continue to be a major priority and emphasis. The disposition process for this material has gone on far*

too long (in excess of 10 years) and more decisive and definite measures should be taken."

The Savannah River Site should be cleaned up and taken care of before any New storage programs are contemplated or instituted, for the sake of the citizens of South Carolina.

The costs to stabilize and dispose DOE's defense high-level wastes are estimated in excess of \$110 billion (2007 dollars).

At the Savannah River Site, DOE estimates that the total costs for high-level waste management and processing is approximately \$20 billion.

We currently have radioactive leaks at SRS. Let's not end up on Hanford Nuclear Site's road. As you know, They have leaked over a million gallons from 67 of their 149 single-shell storage tanks by not dealing with their waste in a timely manner. I know the SRS tanks are better constructed, but some of the tanks have exceeded their recommended life time, so we are dealing with a lot of deadly unknowns.

We would like to see tax payer dollars prioritized to address these dangers.

1. Spent fuel is safer stored in dry casks where it is and not shipped to Aiken.
2. Dry cask storage such as that used in Germany, seems to address the dangers from both environmental and terrorist points for an interim strategic answer.
3. The government is already behind in funding and well beyond the timeline for safe storage of the current amount of high level radioactive waste that has been sitting at the SRS site for 50 + years. Government agencies have been derailed with the problem of where to store nuclear waste for 5 decades, from Yucca MT. to eastern states derailing the selection process. Meanwhile these containers all over the country are springing leaks. We need the clean up at SRS to be a priority. WE need SNF to say at reactors. In this current season of fiscal cliffs and budget cuts, I seriously question new government studies that would accurately show safety margins going beyond the recommended life of the containers. If we see Aiken chosen as an interim storage site, in 20 years, when the government is once again at the fiscal cliff and has to make a choice between paying benefits, theirs and ours, which politician is going to vote for funding nuclear clean up for little Aiken, SC?

And don't you think people will consider that the government holds the purse strings for clean up and storage for the SRS when choosing where to live and move? If Aiken is put on the map for being a storage area for additional nuclear waste without cleaning up the existing waste first, there is a good chance that the horse community, of which I am one, will choose to relocate or not move here at all. A 2008 study, "An Economic Profile of Aiken County and the Economic Impact of the Equine Industry," done by the University of South Carolina Aiken (USCA) School of Business for the Greater Aiken Chamber of Commerce, revealed the following:

The equine industry's economic impact in Aiken County tops \$72 million.

In total, 1,814 jobs in Aiken County can be attributed to the operations of the equestrian industry.

The impact of the equestrian industry on household income is estimated to be \$19.71 million annually. The study also showed that the Equine Industry is the third largest industry group in Aiken.

Hanford is a one horse town, Aiken is not and has a lot more at stake if citizens start leaving because of the threat of additional radiation leakage and a primary site for SNF storage. Then think of all the businesses that would close and jobs that would be lost.

Thank you

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Submitted by:
Jesse Colin Young

Jesse Colin Young speaks at the NAC 3/14/13

The so called "community reuse organization" is a small group of folks with a nuclear agenda. I speak for another small group of citizens called Don't Waste Aiken. We have only a health and safety agenda.

Aiken is in the throes of a cultural Renaissance and I, with my wife and family, am proud to be a part of that rebirth. I was a rock star and now I am a roadie in service to the children of Aiken County and beyond. Myself and other volunteers have carried the electric pianos and the sound systems that were once part of my road show so that our students can hear the incredible music of the most talented young musicians in the country from the Juillard School in New York, which now has a permanent satellite campus in Aiken.

3 weeks ago my wife and I were invited to a small fundraiser for the Governor. She told us that it was the people of Aiken, the influential people gathered in that room, who had put her first campaign on the map, who had given, as she put it, "Nikki who?" a last name. We communicated personally to the Governor our worries that the cultural renewal that she applauds in Aiken cannot survive the stigma of our town becoming the nations nuclear waste dump! Last night I spoke to a wealthy Woodside couple who are already considering moving away if the flow of waste to the SRS increases.

As you know, spent fuel recycling in the U.S. has created one of the largest environmental legacies of nuclear waste in the world. By the end the Cold War about 100 million gallons of high-level radioactive wastes were left in aging tanks that are larger than most state capitol domes. More than a third of some 200 tanks have leaked and threaten water supplies as important as the Columbia River and new leaks at Hanford have been reported recently. Unhappily, a large portion of that waste is close to my hometown at the SRS. According to DOE, treatment and disposal will cost more than \$100 billion; and after 26 years of trying, the Energy Department has processed only a small fraction of these wastes for disposal. By comparison, the amount of waste that could be generated from spent power reactor fuel recycling in the U.S. would dwarf that of our nuclear weapons program - generating about 25 times more radioactivity.

The children of this state are looking to us to be wise leaders and to protect their health and keep them safe. For our children sake and the sake of our great, great grandchildren, it is time for us to own the nuclear mess that we have made, and NOT TO EXPAND IT, but to concentrate all of our efforts and all the tax dollars we can squeeze out of Washington, to clean our nuclear weapons waste up!

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Submitted by:
Suzanne Rhodes

Suzanne Rhodes, League of Women Voters:

- The NRC regulatory agenda published last fall talked about beginning reprocessing regulation development in the 2030's. BRC reported that NRC is looking at casks to contain SNF for as much as 300 years. Clearly there is no need to rush into reprocessing

- Bob Alvarez's report presented to "Don't Waste Aiken" contains quite a bit of very good information, including why reprocessing does not reduce the need for a repository since the reprocessed waste stream is so hot. It is available at:

<https://docs.google.com/file/d/0B34tchlsLOxfY3RHHRMUU9IRE0/edit>

- The Waste Fund deposits and plans for "all that money" are a bit of a fiction. The Fund is on a spread sheet somewhere, but unless we're lucky, that money has already been spent. Congress has been commingling it with its general appropriations since the 80s. A real push will be needed to get funds for future needs.

- The League's position that if the US is going to meet its schedule for permanent storage, all stakeholders need to be focused on permanent, not temporary, storage. "We need to keep our eyes on the prize."