Letters to the Editor and Guest Editorials of 2014

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9 December 2014

Don't minimize the U.S. nuclear future
Clint Wolfe
Column for *The Aiken Standard*
Aiken SC

It is entirely appropriate of the Environmental Protection Agency. or EPA, to propose carbon mitigation goals with respect to generation of electricity in the U.S. However, it is both perverse and irrational of the agency to impose a carbon mitigation rule that downplays the value of nuclear power in the battle against climate change.

The U.S. fleet of 100 nuclear plants accounts for nearly two-thirds of the nation's carbon-free energy production. So you might think that an agency so concerned about climate change would applaud the use of zero-carbon nuclear power. Or at the very least would give nuclear power equal consideration with renewable energy sources in its carbon emissions rule. But the proposed rule - which requires South Carolina to curb carbon emissions by 51.4 percent by 2030 - is rigged against nuclear power, only counting 6 percent of existing nuclear-generated power toward the state's carbon-reduction target.

What's more, EPA's formula is even worse for nuclear reactors under construction. It assumes they are complete, which means that South Carolina won't be able to count the additional twin units at the Virgil C. Summer nuclear plant near Jenkinsville, which are slated to go online by 2018. For South Carolina, losing those 2,200 megawatts, on top of more than 90 percent of its existing nuclear-generating capacity, will make it extremely difficult if not impossible to meet the EPA target - unless the rule is changed.

Georgia and Tennessee - two other states with nuclear plants under construction - also face tough carbon-reduction goals. But South Carolina has the third most stringent target, after Arizona and Washington. South Carolina obtains 53 percent of its electricity from nuclear power, with another 29.5 percent from coal, 14.6 percent from natural gas, and 0.5 percent from hydro.

The EPA has ascended to new heights of hypocrisy on this matter. On the one hand, the agency has called for greater use of nuclear power, along with other low-carbon energy sources, but then penalizes states with a lot of nuclear power. In fact, a state with no nuclear power will benefit, because its formula will not include nuclear generation, resulting in an emission goal that is easier to achieve. But states like South Carolina and Georgia have carbon-reduction targets that will be significantly harder to meet.

This is not the first time that the EPA has wandered into inappropriate territory on the exclusion of nuclear in the "green" mix. During the first term of President Barack Obama's administration, energy mandates were on the front burner, but the sponsors preferred not to include "nuclear" among those energy sources categorized as "renewable." Setting reasonable goals based on some measurable criteria such as carbon emissions per megawatt seems to be a very appropriate role for the EPA - defining what technology may be used to get there is not. EPA risks being perceived as an economic stimulus organization for chosen industries.

The rule is scheduled to be promulgated in final form next June. Let's hope the new Congress tells the EPA either to change the rule or start over with a new rule that is strong on goals, but light on prescription.

Clint Wolfe is the executive director of Citizens for Nuclear Technology Awareness, and formerly chaired the Technical Advisory Panel to the Department of Energy's Plutonium Focus Area.

9 December 2014

Ruling on nuclear waste throws storage scenarios into dangerous doubt
Clint Wolfe
Guest Column for *The Augusta Chronicle*
Augusta GA

The headlines that trumpet a cacophony of changing events both at home and abroad have left little room for in-depth analysis of a less spectacular, but perhaps just as important, issue.

IN A SEPT. 19 meeting that took only a few minutes, the Nuclear Regulatory Commission passed a ruling regarding continued used nuclear fuel storage. Without getting into all of the history, court challenges and past waste confidence policy issues, suffice it to say this ruling is a potential game-changer for how this country regards the role of nuclear energy in its future energy plans.

The essence of the issue is that the lack of a geological repository specifically identified for used nuclear fuel has caused the government to consider other alternatives. These include, but are not limited to, onsite storage of the fuel and consolidated interim storage.

A series of court challenges over time has seen the NRC stick to its so-called waste confidence rule. This rule has aspects that are pertinent to this discussion.

One is that if you don't have a place to put the used fuel, then you can't make any more. Anti-nuclear activists have pushed the viewpoint that no more nuclear power plants should be licensed until there is a permanent repository. The NRC has responded in the past that they are confident that a repository would be available before it is needed, and merely kept changing the date when that would occur.

THIS APPROACH led to a challenge that the NRC was violating the National Environmental Protection Act by proposing a significant new federal project without having determined the environmental impact. This environmental impact could be looked at in every case to significantly slow each new license application.

The NRC's recent action closes out the waste confidence rule and introduces the continued storage rule. This rule was adopted at the end of August based on a two-year study to determine, generically, the environmental impact of different scenarios of storage. The first of these scenarios was on-site storage for the 60-year operating period of the nuclear power plant. The second of these also considered impacts from an additional 100-year period of storage, and then a third scenario where the fuel remained on-site indefinitely.

The study found no significant environmental impacts from any of the scenarios. This is a huge determination, because now when anti-nuclear forces attempt to slow a license application by demanding an environmental impact statement be performed on the matter of used fuel storage, the applicant simply can incorporate the ruling by reference, thus negating that approach as an effective delaying tactic.

A VERY IMPORTANT caveat should be noted. Existing institutional controls were assumed to be maintained throughout the duration of the particular scenario. This begs for an analysis of the economics of maintaining institutional controls at multiple site locations, vs. consolidated storage and its attendant controls, vs. geologic storage. Such analyses are not likely to be defined in any way that will provide an irrefutable answer to the used fuel storage problem, since these kinds of analyses have been going on for 30 years with no definitive conclusions.

The NRC's determination tips the playing field to a more favorable position for nuclear advocates in that the anti-nuclear forces have long had the benefit of arguing that we don't know what to do about nuclear waste,

so therefore we should not use the technology. The action of the NRC, although not addressing all potential impacts, is effectively saying, "So what?" and "There are no significant environmental impacts from indefinite storage of used fuel." This means that, not only is used fuel storage safe, but any sense of urgency to resurrect Nevada's Yucca Mountain, or to find an alternative such as New Mexico's Waste Isolation Pilot Plant, is diminished.

LOCALLY, IT MEANS that vitrified high-level waste at Savannah River Site may have to look for a permanent home somewhere other than in Yucca Mountain. So, a potential downside to this new rule is that it may help sustain the atmosphere for not dealing with the permanent storage issue. Imagine that!

(The writer is executive director for Citizens for Nuclear Technology Awareness in Aiken, S.C.)

13 October 2014

Finding a permanent nuclear storage center
Clint Wolfe
Column for *The Aiken Standard*
Aiken SC

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The commission has responded in the past that they are confident that a repository would be available before it is needed and merely kept changing the date on which that would occur.

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Clint Wolfe is the executive director of Citizens for Nuclear Technology Awareness, and formerly chaired the Technical Advisory Panel to the Department of Energy's Plutonium Focus Area.

22 August 2014

Nuclear industry has reshaped community
Chuck Munns
Column for *The Aiken Standard*
Aiken SC

There is much today that generates controversy. But nuclear technologies should not be one of them. Humans fear what we do not understand, but hard work by brilliant people has led us to know and harness the atom. It's been more than 100 years since Madam Curie discovered radium. Consider what has been accomplished since: x-rays, microwaves, nuclear propulsion, nuclear electricity, nuclear medicine and more.

The nuclear industry keeps our nation free, it makes our state productive and our regionstrong.Nationally, nuclear medicine provides cutting edge treatment for many maladies including cancer and other disorders. One hundred nuclear facilities in 31 states generate vital "base load" electricity. It is clean, accounts for 64 percent of all our emission-free electricity, and it is cheaper than other sources of power. Nuclear technologies ended World War II, enabled our ships and submarines to bring the Cold War to a peaceful conclusion and continues to provide our National Security today.

Our state is more productive. Nuclear provides tens of thousands of good paying jobs, a significant portion of our states GDP, and a reason major industries find South Carolina attractive. It helps our other industrial sectors - aerospace, automotive, general manufacturing - by providing cheap, reliableelectricity. I've heard Kevin Marsh, CEO of SCANA, say that nuclear is the most reliable and cheapest electricity on his system. South Carolina's nuclear power plants supplied 57 percent of the state's electricity last year, and that has helped drive South Carolina's industrial electric rates nearly 10 percent below the national average.

The S.C. Department of Commerce promotes our nuclear sector as part of its strategy for a strong, diversified and growing state economy.

Commerce partners with the Economic Development Partnership in our area, NuHub in the central part of our state and many others. They organized a nuclear sector taskforce conference last summer. South Carolina is the only state where the governor has established a formal Nuclear Advisory Panel.

Our region is stronger. We are home to the whole "nuclear ecosystem:" a nuclear experienced work force, technically focused education, nuclear power plants, the Savannah River Site, and many smaller business in support.

I argue that Aiken would not be the place that we enjoy without the SRS. Whether you consider the number of employees, the size of its payroll, the community facilities it has funded or the neighborhood organizations it supports; they all contribute to the Aiken we love. Imagine Aiken without our two colleges, our Center for the Performing Arts, much of the funding and manpower for our civic and charitable organizations. One of every five jobs and one of every four households is SRS related.

SRS provides more than our livelihood. SRS makes the world safer. Our neighbors that work at SRS contribute daily to our national security; whether it be their production of tritium, their leadership to rid the world of proliferable nuclear weapons materials, their expertise in sensitive monitoring or their high-end modeling and computing. They provide us energy security through efforts in hydrogen research, battery research and development and nuclear materials expertise. They have provided energy systems for our intergalactic space probes. Those neighbors are world leaders in environmental remediation.

Our Savannah River National Laboratory is the only national lab rooted in nuclear chemical engineering and with a principle focus on environmental management. In addition, the work at SRS has closed Cold War

liquid tanks, processed nuclear materials in chemical separations, cleaned up old decommissioned facilities and provided environmental expertise around the world.

Please seek out and congratulate your neighbors who work or have worked in our nuclear sector.

They do a very important job for our nation, our state and our region. They do it professionally with care and great skill. They do it safely.

Every year, their Occupational Safety and Health Administration safety rate is 10 times better than the U.S. industry average.

Thank them for keeping us free, productive and strong. I am proud that we have them and the SRS in our neighborhood, and I hope you are too.

C. L. Munns is a retired vice admiral in the U.S. Navy, former CEO of Savannah River Nuclear Solutions and chairman of Citizens for Nuclear Awareness.

10 August 2014

Savannah River Site is a national treasure, and we must use it wisely
Donald N. Bridges, Ph.D.
Guest Columnist for *The Augusta Chronicle*
Augusta GA

It generally is recognized in the CSRA and the nuclear community at large that Savannah River Site represents a unique asset - a true national treasure. For about 65 years the site has supported national interests and has provided essential services to the United States, ranging from special nuclear materials production in the early years to spent fuel receipts from foreign nuclear reactors; and environmental cleanup in more recent years while providing an ongoing tritium production and recycling role.

THE SITE HAS BEEN a good employer, offering high-paying, high-technology jobs, with employment levels typically ranging from 10,000 to 14,000 people in a very safe environment. The site population is important because economic studies show that each site job provides an additional 1.5 jobs in the community. A site work force of 12,000 workers generates an additional 18,000 jobs in the CSRA. Further, the site mission has been carried out in a large, green, forested area of about 300 square miles, allowing unparalleled pristine, environmental settings with attendant environmental research.

Now things are beginning to change. After 20 years of cleanup, the site cleanup program, under the aegis of the U.S. Department of Energy's Office of Environmental Management, is about 50 percent complete. Cleanup at the site is an approximately 40-year program, and work could be completed well into the late 2030s. This completion will result in the loss of several thousand site jobs. To maintain the character of the site, it is important to immediately seek appropriate additional missions for SRS consistent with the site's historical *capabilities*.

ONE VIABLE additional SRS mission would be to assist other locations with their cleanups. The site has unique processing capabilities at its H-Canyon, and excellent supporting technical expertise, particularly the Savannah River National Laboratory. In each such case, the site would support national security by making nuclear materials more secure and invulnerable to improper use.

As new mission opportunities are considered, it is important that this community embrace the direction in which the site is moving. It's a national treasure that should serve us all. Here are a few criteria that I feel are appropriate for any new SRS missions:

- Any nuclear material receipt should be done with the implicit approval of the state of South Carolina, and an acknowledgement of the national security interest being served.
- Any proposed new missions should offer significant benefit to the site in terms of additional jobs and economic impact.
- In all circumstances, SRS should be maintained in a pristine environmental condition for wildlife, environmental research and public involvement.
- Such missions can be carried out safely and have minimal environmental impact.
- Any missions would have minimal impact on agreed-to schedules for the processing of existing high-level nuclear waste and general site cleanup.

ANY MISSIONS that meet the above-stated guidelines would be in the best interests of this general area. The site could continue to do what it has done in the past 60 years: providing attractive jobs while making the country at large safer and more secure.

The Department of Energy now is considering an additional mission for SRS, and is preparing an environmental assessment related to the acceptance and disposition of used nuclear fuel containing

U.S.-originated, highly enriched uranium from Germany. While some of the detailed impacts have yet to be established, it appears that receipt of this fuel will be an ideal match for SRS capabilities. SRS will be able to disposition this fuel by processing it much as they have processed other nuclear fuels for years.

IN ADDITION, highly enriched uranium will be taken out of harm's way and placed in a safe, secure setting, making the United States and the world a safer place. This particular nuclear fuel is somewhat different in how it will be processed, and will require further research and development. The German government will be paying for the research and development and for the processing, which is anticipated to cost about $1 billion over five or six years. This provides the SRNL the added benefit of expanding its technical capabilities.

Overall, this looks like a good starting point for SRS to develop new missions. I ask the public to support SRS in developing new missions that maintain the character of the site. SRS will, in turn, continue to be the asset that we've always known.

(The writer holds a doctorate from Georgia Tech. He was a manager for the Department of Energy at SRS for more than 30 years; formerly chaired the SRS Citizens' Advisory Board; and now serves as vice-chairman of the Citizens for Nuclear Technology Awareness, based in Aiken, S.C.)

17 July 2014

Positive aspects exist for processing German Fuel
Clint Wolfe
Special to *The Aiken Standard*
Aiken SC

There has been an awful lot of heat, but little light, accompanying the "tempest in a tea pot" atmosphere surrounding the proposal to accept German experimental reactor fuel at the Savannah River Site. Politicians are pounding chests, demanding answers to questions that cannot be answered until ongoing research and development at the Savannah River National Laboratory, or SRNL, is completed.

Familiar anti-nuclear, anti-SRS voices are quoted and given credence in our local press without questioning the basis for their protests. Characterizations of SRS being a "dump" for nuclear waste have been incorporated in news articles with the sole intent to sensationalize the issue.

I worked at SRS for 16 years. I didn't work in a "dump." I worked at a site that was a National Environmental Research Park with incredibly unique and healthy flora and fauna. I worked at a site that was the best characterized 310 square miles on earth. I worked at a site with a safety record that is the envy of every industry on earth.

I worked at a well-engineered and monitored site. These are not characteristics of a "dump." Rather, "dump" is what we do with fossil fuel waste in our air, our water and our soil. A student in a class I was addressing answered the question of how we deal with fossil fuel waste by replying, "We breathe it, we drink it and we eat it." This contrasts starkly with the extensive precautions to isolate nuclear waste from humans and the environment.

So, what about the German fuel? If all you know is what you read in the newspapers, then you would think Germany is trying to unload a nuclear waste problem on the SRS. A sober look at the facts might help us understand that this is, in its simplest form, a continuation of a crucial mission at SRS.

In fact, the SRS has been central to this country's nonproliferation efforts since the early days of the Atoms for Peace program. This program was instituted to promote peaceful uses of atomic energy and several international agreements followed the original one proposed by President Eisenhower. These agreements provided for highly enriched uranium to be supplied to tens of countries all around the world for use in their research and experimental reactors. Both Russia and the U.S. provided this material, and each ultimately agreed to take the material back when the host country was finished with it.

Following the Cold War, we not only reemphasized the repatriation of U.S. origin highly enriched uranium, but we even helped finance the repatriation of Russian highly enriched uranium to Russia. In all, more than 600 such reactors around the world were using these fuels, although many of them have now been decommissioned.

The International Atomic Energy Agency used to maintain a website depicting the location and status of all of these reactors, but the practice was discontinued after 9/11 as a security measure.

Therein lays the compelling reason for the proposed German fuel to be repatriated under these agreements. Some argue that there may be technicalities that should exclude the fuel from these agreements, but there is no doubt that the spirit of the agreements includes this fuel. So, why is there such a stir about this fuel? Well, it is a unique fuel requiring special processing to handle it. The process is still under development by SRNL. Because the process is different from what has typically been done with fuels containing highly enriched uranium, the Department of Energy called for an environmental assessment and a public meeting

to understand what potential impacts the public wanted evaluated in the EA. That process will run its course over the next several months before the DOE even decides to accept the fuel.

This role of repatriating U.S. origin highly enriched uranium from other countries has been ongoing for decades at SRS as the principal tool that the U.S. has to combat proliferation of weapons-capable highly enriched uranium and make the world a safer place.

The German fuel is an even better story because SRNL has been paid by the German government to develop this process, and Germany will pay for the actual processing.

Instead of wringing our hands over this fuel, we should be thankful that our country has the assets at SRS and SRNL to allow safe and secure shipment to the SRS for safe processing rather than having it come here as part of a terrorist device.

Clint Wolfe is the executive director of Citizens for Nuclear Technology Awareness, and formerly chaired the Technical Advisory Panel to the Department of Energy's Plutonium Focus Area.

9 April 2014

MOX does have customers
Clint Wolfe
Letter to the Editor of *The Aiken Standard*
Aiken SC

On Monday March 31, the Aiken Standard published a letter from Maxine Dexter stating among other things, "there is no market for MOX fuel made from weapons grade plutonium ... "

The claimed lack of customers is misleading on at least two counts.

First, MOX is a program to eliminate plutonium from ever being used in nuclear weapons again and won out as the method of choice over numerous multi-billion dollar alternatives, none of which eliminated the plutonium. The alternatives amounted to a choice between different ways to protect the environment and largely ignored the all-important criterion of never being able to be used in a nuclear weapon again.

The potential for recovering some of the cost by selling the fuel was a cost recovery element that no other alternative had, but it was never envisioned to "make money."

Secondly, the Department of Energy knows they have a buyer for all of the MOX fuel, but for whatever reason, they have been considering the offer for months while fueling the anti-MOX forces' efforts to make the most of the "no customers" myth.

Clint Wolfe
Aiken

16 March 2014

Decision to delay mixed oxide fuel facility at SRS is reckless, misguided
Clint Wolfe, Ph.D.
Guest Columnist for *The Augusta Chronicle*
Augusta GA

On July 13, 2011, the Plutonium Management and Disposition Agreement entered into force after the exchange of diplomatic notes between Russia and the United States.

The world breathed a sigh of relief.

The PDMA would be the second of two of perhaps the most significant diplomatic agreements in our history. The first was the recently expired agreement to purchase highly enriched uranium taken from former Soviet nuclear weapons and convert it into fuel to power the American economy.

FOR THE PAST 20 years, half of all nuclear power generated in this country, or 10 percent of all electricity generated in the United States, came from weapons formerly aimed at us and our allies. Paying the Russians for their uranium made it profitable for them to cooperate, which was essential to securing the safety of these weapons in the several former Soviet states. Now we are building a mixed oxide fuel fabrication facility at the Savannah River Site to eliminate plutonium recovered from our own nuclear weapons. This is aimed at accomplishing the intent of the PMDA, which requires both the United States and Russia each to eliminate 34 metric tons of plutonium (enough for 17,000 nuclear weapons). The facility is 60 percent complete, but the president's 2015 budget calls for the facility to be placed in "cold standby." There is something cavalier and reckless about a Department of Energy that would spend billions on a facility of such import only to abandon it when it is 60 percent complete.

The decision-making process has been very opaque as opposed to transparent. A case in point is the recent claim in area newspapers that "studies" show a $30 billion life cycle cost for the MOX project.

Special-interest groups have been using that number for some time now, but there is no publicly available DOE report that makes that assertion. In the interests of transparency, the DOE should make the report available, if it exists, or disown the figure because it is not credible.

The public believed that the DOE was negotiating in good faith with both contractors and elected officials to define a path forward when, in fact, the antinuclear crowd apparently knew that the decision already had been made. The good faith of the officials was met with duplicity on behalf of the DOE. Life cycle costs can be very misleading, and usually are trotted out as a prelude to killing a project. You may notice there are no life cycle costs being discussed for other DOE projects in California, Tennessee, New Mexico, Washington and Idaho. There also are no life cycle costs provided for the alternative approaches to MOX.

THE ONLY COSTS pertinent to decision-making are "to-go" costs from this point forward. Those costs should be incurred costs and avoided costs. They should not include sunk costs or costs that will be incurred regardless of the decision to proceed or not with MOX.

The DOE spent years ruminating on the best approaches to eliminate excess plutonium, a goal everyone agrees is laudable. Now with the process that the DOE finally settled on 60 percent complete, they are returning to their ruminations to second-guess themselves? MOX is a proven technology, having been used in Europe for more than 40 years. More than 30 reactors worldwide are using MOX fuel.

But the DOE now wants us to believe it will be cheaper to try some new technology approach (which they will not share with us) that apparently will not satisfy the terms of the PMDA, which specifies "eliminating"

plutonium. The agreed-upon and essentially only ways to do that are to use fast reactors (Russians) and MOX (U.S.).

THAT BRINGS US to reckless.

The decision is reckless because we will lose a skilled workforce that has performed in an outstanding manner with respect to environmental and Nuclear Regulatory Commission compliance, safety and quality. It's reckless because we have an agreement with the Russians that provides for an inspection and verification protocol to assure us that the Russians are doing what they are supposed to do. This recent budget submittal endangers that protocol.

It's reckless because Russia's fast reactors can be operated either in a safe mode (consume plutonium) or in a Cold War mode _(create plutonium), and if we give the Russians an excuse to withdraw from the agreement, we will not know which position that switch is in - safe or Cold War. We also have no ability to respond with plutonium production of our own.

Why, at a time of great uncertainty and danger in Russia, the Ukraine and the Crimean peninsula would we want to tempt Russian President Vladimir Putin to return to Cold War politics or inadvertently force a miscalculation? Reckless!

(The writer is executive director of Citizens for Nuclear Technology Awareness, based in Aiken, S.C., and formerly chairman of the Technical Advisory Panel to the Department of Energy's Plutonium Focus Area.)

21 February 2014

What took loans so long?
Clint Wolfe
Letter to the Editor of *The Augusta Chronicle*
Augusta GA

The Energy Policy Act of 2005 authorized $18 billion in loan guarantees for new nuclear power plant construction. The Obama administration has since upped that number to $54 billion and on Feb. 20 the Department of Energy approved approximately $6.5 billion in loan guarantees for Southern Co.'s Vogtle Units Three and Four. Additional approvals may push that figure close to $8.5 billion.

We can celebrate that Southern Co. kept the faith that this was the right thing to do in the long run for their customers and their stockholders. Loan guarantees can help reduce financing costs that will save hundreds of millions of dollars over the lifetime of a project such as Vogtle Units Three and Four. We do have to ask, however: Why did it take nine years to get the first one of these in place? As with any new government initiative, the devil is in the details - even though two administrations from opposite sides of the aisle backed these loan guarantees. Doing a deal this large with the government involves an incredible amount of red tape. The task is so daunting that others walked away. A program designed to encourage emission-free generation of electricity should not be so onerous as to cause utilities to retreat to a business-as-usual stance.

So while we applaud the persistence of Southern Co. with respect to pursuing this agreement, we implore the DOE to make the process more user-friendly. They both could do the public a great service by conducting a joint evaluation with the intent of recommending a more effective process.

11 February 2014

Harms of nuclear power overblown
Clint Wolfe
Letter to the Editor of *The Aiken Standard*
Aiken SC

Rose Hayes authored a column in the Feb.2 Aiken Standard entitled "No definitive answers for waste repositories." I was pleased by the factual portrayal of some of the history of nuclear waste management, but mystified by her conclusions at the end of the article, which were telegraphed by her use of anti-nuclear rhetoric.

Specifically, she refers to that anti-nuclear favorite - "deadly" nuclear waste. Water is "deadly" (with drowning being the second leading cause of death among children in the U.S.), driving a car is "deadly" (40,000 fatalities annually in the U.S.), but exposure to nuclear waste has never killed anyone in this country.

The public needs to realize that her conclusions are reflective of ideology, not logic. Hayes closes her column by saying we should not consider any mission for SRS that involves the production of nuclear waste. SRS has the only U.S. assets to effectively deal with processing used fuel that has been in the past and might again in the future be necessary to support diplomatic and nonproliferation agreements, research programs or to implement other fuel cycle initiatives. These could all become government priorities and we should not try to tie the government's hands by advocating stances based on misinformation or preconceived notions. Any process that requires energy generates waste. That waste may be in the form of heat, light or materials. With respect to used fuel, the integrated system at SRS can recover valuable isotopes from it, solidify the liquid waste in a glass matrix and store or dispose of it safely as required by law. The incorporation of nuclear waste in a glass matrix effectively reduces the environmental and human health risk to zero for a couple of million years. After that, I'm not going to worry about it.