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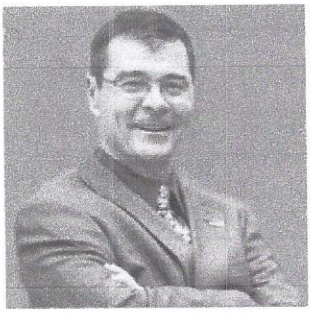
Closing the Nuclear Fuel Cycle - the Ultimate in Recycling



by Tim Echols

Probably everyone reading this recycles something each week as they put out their trash. It's become a no-brainer. People get it. Recycle and re-purpose materials and you extend the life of landfills, saving everyone money.

It also is the right thing to do. But when it comes to the used nuclear fuel from our commercial reactors, our long-range plan is simply to bury it. That has been our policy for decades, but changing the policy may be something President-elect Trump can bring about. We have in this country more than 70,000 tons of used fuel stored at more than 75 sites in 33 states, and the 100 U.S. commercial reactors produce about 2,000 additional tons of used fuel each year.

Nine Yucca Mountains for millennia?

Because we don't recycle this nuclear material, it would take nine Yucca Mountain repositories by the turn of the next century to house all of the used fuel being produced.

Getting one Yucca has proved daunting, let alone nine. In the meantime, dozens of states like Georgia and South Carolina spend hundreds of millions of dollars to let the material sit in highly engineered casks and pools at plant sites. And these have to be replaced every 100 years – for about 1 million years. Definitely not sustainable.

Starting in 1990, the French did what the United States backed away from – they built a commercial recycling plant for used nuclear fuel.

The President of France's Areva US operations, Gary M. Mignogna, explains it like this: "It's a travesty to leave this waste to future generations when we can be extracting more energy from it now and reducing the toxicity from 10,000 years to 100 years."

And he should know, because the French took uranium-filled fuel rods and figured out how to safely reuse 96 percent of the material. By separating the uranium and plutonium from the fission products, they take advantage of all of the energy left in the material.

More importantly, they turn the remaining 4 percent of waste into an inert glass product that requires minimum security and safeguard protocols. If we did that here in the United States, it would significantly reduce potential waste going into a Yucca Mountain and extend the facility's life.

So why is it that the U.S. would not want to do the same? Georgia Tech professor of nuclear engineering Nolan E. Hertel, a renowned expert, notes that one result of the ban on nuclear recycling by President Jimmy Carter, meant to prevent nuclear proliferation, is more than 2,400 tons of nuclear waste being stored on-site in Georgia.

In my opinion, the time has come for the nuclear-energy industry to go green and make the electricity it generates even more sustainable. We also need to demonstrate the value of integrating nuclear baseload with intermittent wind and solar.

Here is how we can do it.

70,000 tons of spent fuel = 12 years of energy

First, let's recognize the energy value of the used nuclear fuel we currently discard. Did you know that our 70,000 tons of used fuel contains roughly enough energy to power every household in America for 12 years?

"Valuing used fuel against the cost of permanent burial is a calculation best done by the companies that provide fuel management services," says Jack Spencer, of the Heritage Foundation. "Right now, utilities have no incentive to do anything but store it."

This would require Congress to act, and Areva's Gary Mignogna suggests this course of federal action: "As DOE provides funds for development of the next generation of reactors, we need to encourage them to support technologies that either burn most of the actinides during the normal fuel burn or that can burn nearly all of the actinides from recycled MOX fuel."

And that is why I am asking Georgia Power to make sure Vogtle units 3 & 4 can burn fuel being fabricated just across the river at the Savannah River Site near Aiken, South Carolina—that is, if the MOX project—the Mixed Oxide Fuel Fabrication Facility—is ever finished.

The MOX plant, modeled after processes currently used in France at La Hague and MELOX, will permanently change surplus nuclear warhead material into commercial nuclear reactor fuel. The MOX facility is 70 percent complete, but haphazard funding from Washington is dragging out the project. We need a president who sees the value in this project.

Finally, recycling used nuclear fuel makes sense in the long run. This recycled material will be available at a discounted price compared to newly fabricated uranium fuel utilities currently buy.

Ratepayers and shareholders will benefit from cheaper reactor fuel, especially in times like today when low natural-gas prices are creating a financial disadvantage for nuclear plants. The cost of nine Yucca Mountains will be astronomical, and recycling will drastically reduce storage for the remaining 4 percent of used fuel.

Let's do the math. If we continue to close coal plants, most of which operate around the clock, and we continue to add intermittent energy sources like wind and solar, and natural-gas generators, how are we going to reduce our net CO2 emissions and provide the reliability that businesses and ratepayers expect? Nuclear energy is the answer, and recycling will make it greener and sustainable.

—Tim Echols serves on the Georgia Public Service Commission.