

# Salt Lake Tribune

## Op-ed: Nuclear reprocessing and Yucca Mountain are non-starters

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William Shugart's April 1 op-ed, "[Reprocessing nuclear waste and Yucca Mountain worth another look](#)," needs "another look." Appeals to reprocess fuel and re-investigate Yucca Mountain (a project I worked on for nearly four years) fall short on a number of fronts.

First, although France, Great Britain, Japan and Russia have opted to reprocess spent reactor fuel from power plants, consider a sampling of countries that have not: the U.S., Canada, Finland, Sweden, South Korea and Germany. A majority of the world's nations forego reprocessing. Why is this? The answer is plutonium.

Germany was cited by Shugart as a shining example of exporting nuclear energy. Actually, Germany is running from nuclear power as fast as it can and plans to shut all of its reactors by 2022.

The Iranian nuclear deal negotiated by the Obama administration was mainly about the enrichment of uranium. Enrichment is hard to do. By contrast, all reactors produce plutonium, which can be weaponized after chemical separation from spent fuel. We are now witnessing what a country such as North Korea can do with plutonium. President Carter was prescient when he banned nuclear fuel reprocessing.

Second, reprocessing does not "reduce nuclear waste significantly." All it really does is reduce the volume of material requiring disposal. Nearly all of the radioactivity remains to be handled

Third, Yucca Mountain is not the solution. President Obama did not halt construction on a repository because the Department of Energy had not (and has not) received a license to construct one. He halted pre-licensing scientific and engineering studies, as well as licensing activities, which remain in limbo.

Yucca Mountain is a dry and remote place. However, many features of the local geology argue against it and became apparent as the site was investigated. The repository horizon is about 1,000 feet below the surface, yet 1,000 feet above the water table.

Even this far above the water table, every cubic meter of rock contains about 90 liters (nearly 25 gallons) of water. Where does this water go when hot (as in temperature) waste is placed in the mountain? The rock is fractured, faulted and exhibits complex hydrological properties.

Predicting where water (and waste) will go is a nightmare. This is why titanium "drip shields" to protect the waste canisters were added to the repository design. Adding these was an admission that there is a water problem — even in one of the driest areas of North America.

A lot of opposition to Yucca Mountain may be "Not in my back yard," but the technical concerns are real.

Progress at Yucca Mountain from the late 1980's to the mid 2000's was frustratingly slow. Nuclear power consumers contributed enormous sums of money to a trust fund to locate and build a storage facility. However, Congress starved Yucca Mountain.

Every year the project had something like \$300 million in fixed costs. If Congress allocated \$400 million, \$100 million worth of science and engineering studies were accomplished. However, there were years when only \$50 million could be spent because Congress allocated \$350 million, resulting in half the progress. Money spent didn't even add to the deficit because the rate payers of nuclear utilities footed the bill. Does anyone expect Congress to have reformed itself since then?

Yucca Mountain is not the answer to the waste problem. Disposal in deep, thick salt formations is

Finally, and most importantly, there is no need to reprocess. Nuclear power, like coal, is dying. There is no nuclear renaissance. A few utilities have added reactor units to existing sites. However, only last week Westinghouse filed for Chapter 11 bankruptcy. Reactors currently under construction by that firm in Georgia and South Carolina are three years behind schedule and at least \$1 billion over budget.

The U.S. produces 20 percent of its electricity from about 100 mostly aging reactors. To replace that capacity and expand it will require the building of hundreds of new power plants. This is not going to happen. As for burning plutonium, the U.S. does not have any commercial reactors that do this.

I am willing to admit that nuclear power may have its place in the future, but only if we ultimately fail to find a way to store sufficient wind and solar energy or develop other renewables. A nuclear renaissance depends on new generations of inherently safe reactors (remember Chernobyl and Fukushima) and a solution to the waste disposal problem for all parts of the nuclear fuel cycle. In the meantime, reprocessing is a moot point.

Steve Nelson is a geochemistry professor at Brigham Young University and a former member and chair of the Utah Radiation Control Board. His views do not necessarily reflect those of his employer.