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Docket: NRC-2018-0052

Holtec International HI-STORE Consolidated Interim Storage Facility Project

Comment On: NRC-2018-0052-0300

Holtec International HI-STORE Consolidated Interim Storage Facility Project

Document: NRC-2018-0052-DRAFT-0319

Comment on FR Doc # 2020-05690

Submitter Information

Name: Martin Kral

Address:

406 Viale Bond

Roswell, 88201

Email: mkral@cableone.net

General Comment

NRC-2018-0052 Reason two: Spent nuclear fuel is not nuclear waste, but reusable fuel for newer advanced molten salt reactors.

One of the most exaggerated misconceptions of the nuclear industry has to do with the leftover fuel rods after they have been removed from a reactor as spent fuel. For decades, they have been referred to as nuclear waste because there wasn't an immediate need to recycle and reuse the fuel content still in the fuel rod. Nuclear waste has always been the wrong description of what is unused nuclear fuel.

There are about 83,000 tons of this solid spent nuclear fuel rods in storage around the country at every nuclear power plant as well as some decommissioned sites. The fuel rods are grouped in canisters and place in thick-walled concrete cask lined with steel and lead. This protected storage has been safely stored above ground on concrete pads for decades. However, with the aging nuclear power fleet of reactors, more decommissioning is occurring and the stored nuclear fuel has to be relocated so the site can be decontaminated for other uses.

The estimated composition of conventional nuclear fuel after being removed from a light water reactor are as follows:

- 94.4 % uranium-238 with very-low radioactivity as unused uranium fuel.
- 01.1 % uranium-235, and 236 with very-low radioactivity as unused uranium fuel.

- 01.1 % plutonium-239, 240, and 241 with long-lived fairly radioactive "transuranic" isotopes as fuel.
- 03.4 % fission products that are highly radioactive, but rapidly decaying for non-fuel applications.

The unused nuclear fuel rods are considered completely "spent" because the fission products exist throughout all the uranium and plutonium. There are three ways to address this condition:

- bury the fuel rods in a deep repository as is to never be used again.
- reprocess to a MOX fuel and reuse in an existing LWR and still have unused (waste) fuel left over.
- convert to a molten chloride salt fuel to be consumed in an advanced molten salt fast reactor.

Regardless of which method is considered, the stored nuclear fuel cask still has to be moved off the original nuclear power plant site to a centrally interim location like HI-STORE CISF in New Mexico.

From my perspective, the stored nuclear fuel rods need to be managed for several decades while the molten chloride salt fast reactor technology is developed by companies like TerraPower Energy and Elysium Industries. There are other companies around the world (ThorCon, Terrestrial, inc.) that are also working on molten salt reactor development. There is always more than one way to skin a cat.