Introducing HI-STORM CIS for Consolidated Interim Storage of Used Nuclear Fuel

We are pleased to announce the completion of the development of an underground used fuel storage technology, termed HI-STORM CIS, to store large quantities of used nuclear fuel at a Consolidated Interim Storage (CIS) facility envisioned by the Blue Ribbon Commission. Begun in the wake of 9/11, Holtec’s underground storage technology has steadily matured over the past 10 years. The HI-STORM CIS facility (see schematic below) is the next generation underground storage design that will house used fuel packaged in any canister supplied by any cask vendor. The HI-STORM CIS features a monitored underground storage cavity with the used fuel's decay heat passively rejected to the ambient air above and its radiation contained within the earth's subterranean continuum. The radiation released to the environment from the HI-STORM CIS facility storing vast quantities of used fuel equates to a fraction of the background cosmic and solar radiation that pervades our planet, i.e., negligibly small.

The HI-STORM CIS design incorporates multiple robust and independent barriers against groundwater contamination, namely, a reinforced concrete ISFSI enclosure, a thick steel cavity enclosure canister, and the all-welded stainless steel confinement boundary. The efficacy of each barrier can be continuously monitored using conventional means, essentially making the risk of potential groundwater intrusion in the fuel storage space non-credible.
The hardened underground cavities of the HI-STORM CIS facility are engineered to provide maximum protection against terrorism and natural disasters; the canisters will remain retrievable and maintain full radiological confinement in the aftermath of an earthquake that is stronger than all prior earthquakes recorded in the continental United States.

The HI-STORM CIS technology is a densified version of HI-STORM UMAX, which is currently undergoing licensing by the USNRC (Docket 72-1040) and is scheduled to be deployed at a U.S. nuclear plant within the next 3 years. In contrast to HI-STORM UMAX, the HI-STORM CIS vertical ventilated module stores two MPCs in a stacked configuration in each cavity; thus the required storage area is halved. A HI-STORM CIS ISFSI is so compact that only 14 acres of land is needed to store 4,000 canisters containing upwards of 50,000 tons of uranium. The same storage capacity will require 28 acres if HI-STORM UMAX were to be used instead.

A key advantage of the HI-STORM CIS technology and its less dense HI-STORM UMAX technology is that the canister is readily retrievable and hence, can be easily relocated.

Furthermore, no credible degradation mechanism that may induce rapid aging of the storage system has been identified, making a 300-year service life of the HI-STORM CIS facility reasonably achievable with minimal maintenance. Holtec International is seeking a qualified partner and host community to exploit the advantages of improved security, safety, and the small footprint offered by the HI-STORM CIS facility.

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