

General Atomics, MHI Team On Yucca Mountain Rail Casks

General Atomics and Mitsubishi Heavy Industries have signed a memorandum of understanding for future transport work related to the U.S. Department of Energy's Yucca Mountain project.

GA and MHI issued a statement last week on the MOU and the scope of their cooperation, which focuses primarily on the Japanese company's fleet of rail casks for shipping spent fuel.

Should DOE's Office of Civilian Radioactive Waste Management opt to buy the casks, GA would act as a prime contractor and take the lead in licensing them with the Nuclear Regulatory Commission, while MHI would fabricate them at its Kobe shipyard and machinery plant in Japan.

Representatives from both companies met with NRC officials Dec. 15 to provide an overview of the teaming arrangement, as well as future licensing plans for both rail and truck casks—all of which GA executives acknowledged hinge on Energy department decisions for the repository's transportation program.

LWTs, Overweight Truck Casks

General Atomics, one of six vendors that submitted in August "cask capability reports" to OCRWM's transportation office, has already licensed its GA-4 PWR truck cask. The company told NRC that, depending on future DOE decisions, it plans to submit an application to amend the GA-4's certificate of compliance.

The potential amendment would increase the truck cask's payload capability by including burnup credit analyses to remove U-235 enrichment restrictions, shielding analyses to relax burnup restrictions, and thermal analyses to relax decay heat limit requirements.

The company stressed that no changes to the cask design will be necessary. It also told NRC that with burnup credit and the other analyses, the GA-4 certificate "can readily be amended to cover most of the (spent fuel) inventory to be shipped" to Yucca Mountain.

GA said that the truck cask, which the agency had referenced in test protocols for its Package Performance Study, does not need any unproven processes to be manufactured. "[The] difficulty in fabrication of 1/2-scale model is greater than in full-scale cask fabrication," the company said.

The San Diego, California, company said that designs for legal weight truck casks for BWR fuel assemblies and defense high-level waste were completed in the 1990s; licensing the defense LWT was suspended.

It also described to NRC its approach to an overweight truck cask for high burnup, short-cooled assemblies, using the GA-4 design approach.

Rail Casks Based on Mitsubishi Fleet

GA told NRC that high capability rail casks for commercial spent fuel and DOE spent fuel and high-level waste would be based on the MSF series of spent fuel transport casks already designed by Mitsubishi.

The MSF-69B was licensed by Japanese regulators in December 2000. The MSF-21P, 57B, and 69B are currently undergoing regulatory testing for certification by German authorities and eventual use by German utilities as dual-purpose systems.

The "GAMSF" rail casks would possess unique capabilities to move commercial spent fuel with burnups above 60 GWd/t, cooling times of five to six years, and five percent U-235 enrichments. Designs for 21 PWR and 57 BWR assemblies would include the following elements:

- Monolithically forged low-alloy steel body
- High strength and thermal conductivity boron-aluminum alloy basket
- Epoxy resin neutron shield with high hydrogen content
- Heat conductor plates between shells
- Outer thermal fins for effective heat dissipation

GA said drop tests of full- and 1:2.5-scale models based on the MSF-69B were conducted in September, October, and November at the BAM Horstwarde facility in Germany.

The drop test protocols included end-on, side-on, CG-over-corner, slap-down (lower and upper), 1m-penetration horizontal, and 1m-penetration vertical.

Results to date show that the cask body, impact limiters, and closure system meets design criteria. GA said the test protocols and data analysis are expected to be completed in 2005.

The GAMSF casks would be fabricated at Kobe, which is ASME NAQ-1 compliant. The shop has a fabrication capacity of two casks per month. ●