

## **A Prototype Four-Inch Short Hydride (FISH) Bed As A Replacement Tritium Storage Bed**

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The Savannah River Site (SRS) tritium facilities have used metal hydride storage beds with 12.6 kg of  $\text{LaNi}_{4.25}\text{Al}_{0.75}$  for tritium gas absorption, storage, and desorption. A prototype third generation (Gen3) metal hydride storage bed has been designed as an improved replacement for second generation (Gen2) storage beds. The Gen2 beds were constructed using 7.62 cm (3 inch) pipe process vessel (PV). The inclusion of an internal thermowell, two heaterwells, an in-bed accountability (IBA) U-tube, Al heat transfer foam, and hydride divider plates produced a bed nominally 1.2 m long which presents a challenge for heater cartridge replacement.

Design details of an improved third generation (Gen3) prototype bed will be presented. The prototype bed constructed had a PV pipe diameter of 10.2 mm (4 inches) so the bed length could be reduced to nominally 0.7 m to better accommodate heater replacement. Modelling results presented show increased absorption rates when using hydrides with lower absorption pressure. To improve absorption rates, a  $\text{LaNi}_{4.15}\text{Al}_{0.85}$  material was procured and processed to obtain the desired pressure-composition-temperature (PCT) properties for improved bed performance. Other improved bed design features are also presented.