UPGRADES TO THE DARHT SECOND AXIS INDUCTION CELLS

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The Dual-Axis Radiographic Hydrodynamics Test (DARHT) facility will employ two perpendicular electron Linear Induction Accelerators to produce intense, bremsstrahlung x-ray pulses for flash radiography. The second axis, DARHT II, features a 3-MeV injector and a 15-MeV, 2-kA, 1.6-microsecond accelerator consisting of 74 induction cells and drivers. Major induction cell components include high flux swing magnetic material (Metglas 2605SC) and a Mycalex™ insulator. The cell drivers are pulse forming networks (PFNs). The DARHT II accelerator cells have undergone a series of test and modeling efforts to fully understand their operational parameters. These R&D efforts have identified problems in the original cell design and means to upgrade the design, performance and reliability of the linear induction cells. Physical changes in the cell oil region, the cell vacuum region, and the cell drivers, together with different operational and maintenance procedures, have been implemented in the prototype units resulting in greatly enhanced cell performance and reliability. A series of prototype acceptance tests have demonstrated that the required cell lifetime is met at the increased performance levels. Shortcomings of the original design are summarized and improvements to the design, their resultant enhancement in performance, and various test results are discussed.