

Design and Performance of an Accelerator-Based Thermal and Fast Neutron Imaging Facility

Michael J. Taylor¹, Josh McCumber¹, Katie Rittenhouse²

¹-, Phoenix LLC, USA, ¹Sales & Marketing, Phoenix, USA

Phoenix LLC has developed accelerator-based neutron imaging systems for NDT. Neutron imaging is a useful NDT technique that is used to identify defects in materials for which X-ray, and other methods will not suffice. The Phoenix Neutron Imaging Center (PNIC) is the first commercial imaging facility to provide high-quality neutron images to a traditional nuclear reactor and spallation sources without the heavy regulatory burdens and high construction and operational costs. The new facility will house a Phoenix high-yield neutron imaging system and provide ten thermal neutron beamlines and one dedicated fast. The ten thermal beamlines will provide a variable L/D of 75-105, a field of view of 14" x 17", flux at the imaging plane of up to 2×10^5 n/cm²-s and with a cadmium ratio of over 4.5. The fast neutron beamline will provide a source of up to 16 MeV neutrons with a yield of approximately 3×10^{13} n/s, with an imaging flux up to 1×10^6 n/cm²-s. This presentation will show initial experiments and neutron images captured on the new PNIC system.