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AmBe Radiological Source Replacement Using Dense Plasma Focus Z-Pinch[1] BRIAN SHAW, ALEXANDER POVILUS, Lawrence Livermore National Lab, STEVEN CHAPMAN, Alameda Applied Science Corporation, YURI PODPALY, CHRISTOPHER COOPER, DREW HIGGINSON, ANTHONY LINK, ANDREA SCHMIDT, Lawrence Livermore National Lab — A dense plasma focus (DPF) is a compact plasma gun that produces high energy ion beams up to several MeV through strong potential gradients formed from m=0 plasma instabilities. These ion beams can be used to replace radiological sources for a variety of applications. Americium-beryllium (AmBe) neutron sources are commonly used for oil well logging. An optimized DPF produces high energy helium ion beams of 2+ MeV which can interact with a beryllium target to produce neutrons. The alpha-Be interaction produces a neutron energy spectrum similar to the neutrons produced by the AmBe reaction. To demonstrate this concept experimentally a 2 kJ DPF is used to produce a beam of alpha particles which interacts with a beryllium target. We report on the improvements made to the DPF platform using He gas and the observation of $\sim 3.0 \times 10^4$ peak neutrons generated per shot.

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