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FTP/P7-02: A 14 MeV Fusion Neutron Source for Material and Blanket Development and Fission Fuel Production

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Fusion Development will require materials capable of withstanding extensive harsh bombardment by energetic neutrons and plasma. The plasma based Gas Dynamic Trap neutron source concept is capable of testing and qualifying materials and fusion blanket sub modules for eventual deployment in fusion energy systems. In this paper we describe new results on the suitability of this source to assess thermal fatigue in fusion blanket components caused by the small normal variability of neutron flux inherent in fusion energy concepts. A second part of the paper considers the requirements for a hybrid fusion-fission hybrid suitable for producing fissile fuel. Both solid and molten salt fuel form blanket designs are described that emphasize non-proliferation and passive safety. Work at LLNL performed under DoE Contract DE-AC52-07NA27344.

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