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Integrated Magnetic System Design for Field Reversed Experiment Liner[1] L. DORF, T. INTRATOR, R. RENNEKE, G. WURDE, Los Alamos National Laboratory, V. SEMENOV, Institute of Applied Physics, Nizhny Novgorod, Russia — Field Reversed Experiment Liner (FRX-L) is a magnetized target fusion experiment, in which magnetically confined plasma is compressed by an imploding aluminum flux conserver (liner) to achieve fusion-like conditions. The entire FRX-L construction must comprise three stages formation, translation, and implosion. The magnetic system design for FRX-L and the eventual integrated liner on plasma experiment . involves diffusion of a time-varying external magnetic field into the region surrounded by a conductive cylindrical surface. It is necessary to protect the multi-turn guide coils that create an almost uniform magnetic field along the translation stage from a fast-varying magnetic field required in the formation region. This fast field can induce a very large voltage and current across the guide coils, causing irreversible damage. One of the ways to protect the guide coils is to use metal flux excluder plates. These plates should be designed such that they would not produce a considerable dip in the resultant magnetic field profile, Bz(z), as the dip in Bz(z) would prevent FRX-L plasma from translating towards the implosion region. In this talk, we propose a design of the magnetic system that fulfills all major requirements for successful formation, translation, and implosion of the FRX-L plasma.

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