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Conceptual design and issue analysis of Laser Fusion Experiment Reactor (LIFT)

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In this work, we report a conceptual design of a laser fusion experimental reactor (LIFT) and an issue analysis of the design. After the demonstration of ignition and burn by a single shot in fast ignition experiment, construction of an experimental reactor will start. In order to bridge the technological gap between the single-shot experiment and a commercial reactor, an experimental reactor LIFT is conceptually designed based on a scheme of three phases. The full-scale laser will be constructed at the first phase and chambers will be constructed around the laser depending on the phase. The goal of the phase I is to demonstrate repetitive fusion burns in a chamber without blankets. The goal of the phase II is to show electric power generation in a dry-wall chamber with solid blankets. The goal of the Phase III is long time operation with a wet-wall, and liquid LiPb blankets. Material test for commercial reactor is also important mission of this phase. Issues on the final optics and radiation safety will be also discussed.

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