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THE ELMO BUMPY TORUS REACTOR*

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ABSTRACT

In the Elmo Bumpy Torus Reactor (EBTR) study the feasibility of achieving a fusion power plant based on the EBT confinement concept was evaluated. If the present understanding of the physics can be extrapolated to reactor scale devices the reactor could operate at high beta, high power density, and at steady state. The high aspect ratio of the device eases the accessibility, structural design and remote maintenance problems which are common to low aspect ratio machines. A version of the EBTR reference design described here could be constructed with only minor extrapolations in available technology.

INTRODUCTION

Fusion reactor system studies to date primarily have dealt with the tokamak confinement concept. Results from these studies show that criteria necessitated by the physics lead to difficult engineering problems. Specifically, a low beta plasma which is confined in a low aspect ratio torus, results in a low power density, nonuniform structural loadings due to the strong curvature, accessibility problems, and requires the use of pulsed magnetic fields which

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