

Abstract Submitted
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**The TASKA, TDF, and TASKA-M Fusion Neutron Materials
Test Facilities**¹

JOHN SANTARIUS, GERALD KULCINSKI, University of Wisconsin — This talk will summarize key features of three conceptual fusion neutron test facilities designed in the early 1980s: TASKA,¹ TDF,² and TASKA-M.³ Motivated by the accessibility and maintainability of cylindrical geometry, these magnetic-mirror designs possess a simple central cell, as in a fusion neutron test facility based on the gas dynamic trap (GDT).⁴ The TASKA-M design, like today's GDT designs, included the injection of neutral beams into the central cell to create a sloshing-ion distribution that gives density peaks near the materials test modules. In TASKA and TDF, the minimum-B end-cell designs contained thermal barriers, regions of low electrostatic potential to reduce electron flow between central cell and end cells. Thermal barriers improve performance but require more complicated input power systems, and their physics basis is less well established than that of simple mirrors. For TASKA-M, a more conservative design, minimum-B end cells provided MHD stability, but thermal barriers and an end-plug potential peak were absent. [1] B. Badger, et al., UW FTI Report UWFD-500 (1982). [2] T.H. Batzer, et al., LLNL Report UCID-19328 (1983). [3] B. Badger, al., UW FTI Report UWFD-600 (1984). [4] P.A. Bagryanski, et al., *Fus. Eng. Design* **70**, 13 (2004).

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