Abstract Submitted
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Generic Stellarator-like Magnetic Fusion Reactor[1] JOHN SHEFFIELD, Retired, DONALD SPONG, Oak Ridge National Laboratory — The Generic Magnetic Fusion Reactor paper, published in 1985, has been updated, reflecting the improved science and technology base in the magnetic fusion program. Key changes beyond inflation are driven by important benchmark numbers for technologies and costs from ITER construction, and the use of a more conservative neutron wall flux and fluence in modern fusion reactor designs. In this paper the generic approach is applied to a catalyzed D-D stellarator-like reactor [1]. It is shown that an interesting power plant might be possible if the following parameters could be achieved for a reference reactor: R/<a>$\approx$ 4, confinement factor, f_{ren} = 0.9 - 1.15, <β>$\approx$ 8.0 – 11.5 %, $Z_{eff} \approx 1.45$ plus a relativistic temperature correction, fraction of fast ions lost $\approx$ 0.07, $B_m \approx$ 14 – 16 T, and R $\approx$ 18 -24 m.

[1] J. Sheffield and D.A. Spong, "Generic Stellarator-like Magnetic Fusion Reactor," submitted to Fusion Science and Technology, June 2015.

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