Eligibility of Small Molten Salt Fast Reactor (S-MSFR)

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Abstract:

Current commercial nuclear reactors face two major problems. Their public acceptance is influenced by the fear of severe accidents and the production of nuclear waste; at the same time the capital cost for their construction are very high due to the growing safety and licensing requirements. Both, the capital cost and the risk of severe accidents may be reduced by so called Small and Medium sized Reactors (SMR). The lower power (density) of the unit may enable robust and passive decay heat removal systems and the smaller size may allow for modular construction with reduced capital costs. Molten Salt Reactor (MSR) as one of the GenIV system can be also designed as SMR. Nonetheless, the inherent features of MSR with liquid fuel can provide similar advantages even at high nominal powers. On the other hand, depending on the design, the treatment of the liquid fuel may be demanding and higher operating cost can lead to preference of bigger MSR units.