

Entering into Space and New Energy and Propulsion Technology (7)  
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## PARAMETRIC ANALYSIS OF A 30KN THRUST CLASS FOR NUCLEAR THERMAL ENGINE(NTE)SYSTEM

### Abstract

Nuclear Thermal Engine(NTE)system has been considered as a feasible technology for Advanced Space Exploration. The high specific impulse and appropriate thrust of Engine system opens up possibilities for Mars exploration mission and unmanned probe mission. In order to parametrically evaluate Nuclear Thermal Engine, a numerical system model has been developed. The engine model utilizes turbomachinery of the existing Hydrogen/Oxygen Liquid-Propellant Rocket Engine, and has a thrust of 30kN based on an expander cycle. The nuclear reactor is based upon a ceramic-metallic(CERMET)fuel element, and a heat and flow model of fuel element has been developed. Performance factors such as thrust ,specific impulse, chamber pressure, maximum fuel temperature have been analyzed. The fuel temperature rise and flow resistance in nuclear reactor has been discussed. The configuration and dimensions of this model have been established, the weight of NTE system has also been estimated.