Design of a Mechanical NaK Pump for Fission Space Power Systems

Omar R. Mireles[1], David Bradley[2], Thomas Godfroy[3]
[1]*NASA Marshall Space Flight Center, Huntsville, AL 35812*
[2]*Yetispace, Huntsville, AL 35811*
[3]*Maxim Technology Corp, Huntsville, AL 35814*

Alkali liquid metal cooled fission reactor concepts are under development for mid-range spaceflight power requirements. One such concept utilizes a sodium-potassium eutectic (NaK) as the primary loop working fluid. Traditionally, linear induction pumps have been used to provide the required flow and head conditions for liquid metal systems but can be limited in performance. This paper details the design, build, and check-out test of a mechanical NaK pump. The pump was designed to meet reactor cooling requirements using commercially available components modified for high temperature NaK service.