

IAF SPACE POWER SYMPOSIUM (C3)
Joint Session on Advanced and Nuclear Power and Propulsion Systems (5-C4.10)

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SPACE NUCLEAR PROPULSION INDUSTRY PARTNERSHIPS CHALLENGES AND
OPPORTUNITIES

Abstract

NASA and the US Department of Energy have partnered to jointly address the challenges of space nuclear propulsion. While the US federal government is assessing the path forward for nuclear propulsion research and development, there are many opportunities for partnerships with the nuclear and space industrial sectors. This paper will address some of these opportunities and provide a roadmap for public-private partnerships to advance space nuclear propulsion technology. The nuclear industry should partner with the government to further research and development, demonstration and deployment of space nuclear power technology. Industry can play a vital role in addressing the challenges including developing fuels for nuclear thermal propulsion and nuclear electric propulsion systems, scaling up and operating subsystems, providing storage solutions for liquid hydrogen, and conducting ground-based testing of these systems. Industry can also work alongside the federal government to assess and develop standards for nuclear propulsion technology. Modeling and simulation of space systems will be a key part in developing nuclear propulsion systems and the computing sector is well positioned to provide those services to the federal government to advance the goals of the space sector. As the global community looks towards the human exploration of Mars, relying on the capabilities of the space and nuclear industrial sectors, working in partnership with the federal government, will be critical to future Mars missions.