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THE IMPACT OF CHANGING POLICIES ON NUCLEAR SPACE TECHNOLOGY

Abstract

Nuclear technology has been used to enable space exploration since the dawn of the space age, primarily acting as power and heat sources for robotic exploration craft through radioisotope power systems. In the near future, new advancements could expand nuclear technology into the realms of fission surface power and propulsion as well. While this technology enables advanced spacecraft design, it often faces public discussion and scrutiny due to the actual and perceived risks associated with a potential mishap or failure. Multiple national and international policies have been put into place to reduce risk and enable the safe launch and use of nuclear-enabled spacecraft since the advent of this capability.

As more states and non-state entities prepare to return to the Moon and expand exploration programs in the solar system, the opportunities for the use of space nuclear technology are likely to increase. Facing this increase, policymakers must understand the advancements of the planned next-generation spacecraft and balance their needs with the safety requirements that enable safe launch and operation. Furthermore, policy makers must grapple with the potential impact of public opinion, which has ranged from supportive to oppositional for each mission. This paper will survey selected historical and modern space nuclear technology developments and programs as well as selected national and international policies that have governed the use of nuclear technology in space. Additionally, this paper will analyze for connections, correlations, and the general relationship between these frameworks and contemporary public opinion. This study can inform potential operators and regulators as they proactively develop efficient frameworks that ensure progress, safety, and proper engagement with public opinion.