

SPACE PROPULSION SYMPOSIUM (C4)
Nuclear Propulsion and Power (7.-C3.5)

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SAFETY AND NUCLEAR POWER SOURCES FOR SPACE SYSTEMS

Abstract

Nuclear power sources have been used in space applications for decades. They have been used extensively for electrical power production, and their future potential for propulsion has been recognized since the dawn of the spaceflight era. Nuclear power sources offer many advantages in terms of long duration operation and high power densities independent of distance and orientation with respect to the Sun. However, it is also broadly known that use of radioactive materials do carry more risk that must be addressed to ensure safe operation during all phases of the mission, particularly before and during launch into orbit. Almost all of the nuclear-powered missions to date have been flown by the United States and former Soviet Union, but other space-faring nations have recognized its importance for their future missions. Consequently, many in the space community have advocated the development of a broad set of principles that could be applied on an international basis. This paper examines the current guidelines by the major space-faring nations, and suggests a framework primarily based on the U.S. methodology for ensuring reduction of risk, mitigating environmental impact and promoting launch safety.