Space Nuclear Propulsion and Power

Book 3

Space Nuclear Fission Electric Power Systems

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Cover image of Jupiter Icy Moons Orbiter provided by NASA. © NASA
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Nuclear fission offers distinct advantages in supplying the power-intensive needs of human explorers. Nuclear is always on, day or night, eliminating batteries. Reactors are also compact and immune to obscuring dust.Â Kilopower is aimed at developing concepts and technologies that could be used in an affordable fission power system supporting long-duration stays on planetary surfaces. Managed by NASAâ€™s Game Changing Development program within the Space Technology Mission Directorate, Kilopower kicked off in 2015, and in less than three years, and for under $20 million, NASA and its government agency partners designed, assembled and operated a uranium-235 fission reactor to produce 10 kilowatts of power under realistic space environmental conditions. Space Nuclear Power Sources Presentation JRC ITU Karlsruhe, 15July 2004. 2. Leopold Summerer. 1.1 Why Nuclear Power in space? Space Nuclear Power Sources Presentation JRC ITU Karlsruhe, 15July 2004. 3. Leopold Summerer.Â ! Space reactors are small fission reactors, using the fission heat to generate electricity (nuclear electric systems) or heat up directly propellant (nuclear thermal propulsion). ! Radioisotope systems use the natural decay heat of radioactive isotopes as such or to converted it into electricity. ! â€œNuclear Propulsionâ€ is the overarching term for. ! Nuclear electric propulsion (NEP) systems (nuclear generated heat-electricity-electric thrusters). ! Nuclear thermal propulsion (NTP) systems (nuclear generated heat-direct propellant acceleration).