

SPACE NUCLEAR TECHNOLOGY

Position Statement

March 2000

SUMMARY

The United States has been designing and launching radioisotopic-based thermal and electric generators for over thirty years. These systems have safely and effectively been used in robotic missions and science experiments now reaching beyond Pluto's orbit. Without these valuable power sources, the missions would not have been possible; however, these power generator systems are not large enough to totally sustain human life in the exploration and development of space.

To go to Mars and beyond, reactor-based systems are needed. In the near future, thermal and fast fission reactors can generate electric power for various rocket and planetary surface-based systems. Reactor systems can also expand and expel a propellant as the mode of propulsion. In the future, advanced propulsion systems like fusion and anti-matter will be needed to explore the outer planets and beyond the solar system with humans and robotic missions.

Such power generation systems are necessary if the human exploration and development of the inner and outer planets and planetary bodies is a goal of the United States and the world. The radiation environment outside of the earth's magnetic field is hostile enough to require a combination of the proper choice of construction materials and short transit times. Nuclear-based power systems assure the ultimate safety of our astronauts by providing enough power to achieve mission requirements. The American Nuclear Society supports and advocates the development and use of radioisotopic and reaction-based nuclear systems today and in the future to enable and continue the exploration and development of space with humans and robots.

The American Nuclear Society, founded in 1954, is a not-for-profit scientific and educational society of over 11,000 scientists, engineers, and educators from universities, government and private laboratories, and industry.

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