SPACEAGE POWER

Using Nuclear Power To Explore Space

(NAPSA)—The sky may be the limit when it comes to what we can learn through space exploration. However, when it comes to supplying the energy needed to power a spacecraft, the options may be more limited.

Solar panels stop becoming an effective method for powering spacecraft for deep space exploration farther from the Sun than Mars. That's why the Department of Energy and NASA are exploring ways to develop new power systems.

One such power system is called a Multi-Mission Radioisotope Thermoelectric Generator (MMRTG). It is intended for operation in both the vacuum of space and in the atmospheres of planets. Thus, the multi-mission designation.

Radioisotope thermoelectric generators (RTGs) work by a much different technology than conventional nuclear power plants in the U.S. or Europe. RTGs are not nuclear reactors and have no moving parts. They use neither fission nor fusion processes to produce energy. Instead, they provide power through the radioactive decay of plutonium.

Radioactive materials, such as plutonium, generate heat as they spontaneously decay into non-radioactive materials. The heat can then be converted into electricity which can then be used to power a spacecraft.

These generators can not explode like a nuclear weapon. Nuclear weapons are made of high-grade and unstable isotopes of uranium or plutonium and are designed very precisely to cause a fission reaction. RTGs can only produce heat! However, because

Radioisotope power systems have the potential to significantly enhance the scientific exploration of Mars.

RTGs are fueled with a radioactive fuel, each launch of a vehicle with an RTG requires Presidential approval to ensure the safety of the public.

Given that they are, at this point, thought to be the most feasible way to power satellites beyond the orbit of Mars, NASA engineers are striving to make them the safest, most indestructible parts of a spacecraft.

RTGs have been used on 25 missions over the past three decades. While they have never caused a spacecraft failure on any of these missions, they have been onboard three missions that experienced malfunctions for other reasons. In all cases, the RTGs performed as designed.

More than 30 years have been invested in the engineering, safety analysis and testing of RTGs. Safety features are incorporated into the RTGs' design, and extensive testing has demonstrated that they can withstand physical conditions more severe than those expected from most accidents.

To learn more, visit the Web site at www.NASA.gov.