

Although a small, self-contained unit might seem an obvious power source for a satellite, radioisotope thermoelectric generators actually powered only a few of the many satellites the United States placed into earth orbit. Altogether they provided electric power for six Navy navigational satellites, two Nimbus meteorological satellites, and two communications satellites. Solar panels provided a more suitable power source for most earth satellites.

The race to the moon and the requirements of space exploration, however, created more varied and challenging uses for radioisotope thermoelectric generator power units than did satellite missions. Because they were relatively rugged, light weight, and compact, contained no moving parts and did not depend on the sun for power, the National Aeronautics and Space Administration decided that radioisotope thermoelectric generators should power instrument packages and probes which must survive severe environments with little or no sunlight. Radioisotope thermoelectric generators therefore were developed to supply electricity to instrument packages left on the moon during the long lunar night. Astronauts deployed five Apollo Lunar Surface Experimental Packages on the moon between November 1969 and December 1972. Not only did the radioisotope thermoelectric generators survive the lunar night but they also continued to supply power until shut down on command from the earth years later.

The ability to supply power in severe, sunless environments also prompted the National Aeronautics and Space Administration to select radioisotope thermoelectric generator units to power the Viking unmanned Mars lander and the Pioneer and Voyager space probes to Jupiter, Saturn, and beyond. The Viking lander sent back the first pictures taken from the surface of another planet, correcting many misconceptions about the red planet. Although Mars was considered a prime candidate for supporting some form of life, Viking found no evidence of it on Mars. Surviving the Jovian radiation belts, the Pioneer and Voyager spacecraft provided a wealth of data about Jupiter, Saturn, and their moons, surprising scientists with unexpected discoveries. Overnight our conception of these worlds changed from planetary systems frozen in cold storage for eons to dynamic systems with swirling clouds of gases, tempestuous storms, ever-changing rings, and moons with active volcanoes