Kilopower—Pioneering space fission power system could provide up to 10 kilowatts of electrical power

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Credit: NASA

When astronauts someday venture to the moon, Mars and other destinations, one of the first and most important resources they will need

is power. A reliable and efficient power system will be essential for day-to-day necessities, such as lighting, water and oxygen, and for mission objectives, like running experiments and producing fuel for the long journey home.

That's why NASA is conducting experiments on Kilopower, a new power source that could provide safe, efficient and plentiful energy for future robotic and human space exploration missions.

This pioneering space fission power system could provide up to 10 kilowatts of electrical power—enough to run two average households—continuously for at least ten years. Four Kilopower units would provide enough power to establish an outpost.

About the Experiment

The prototype power system was designed and developed by NASA's Glenn Research Center in collaboration with NASA's Marshall Space Flight Center and the Los Alamos National Laboratory, while the reactor core was provided by the Y12 National Security Complex. NASA Glenn shipped the prototype power system from Cleveland to the Nevada National Security Site (NNSS) in late September.

The team at the NNSS recently began tests on the reactor core. According to NASA Glenn's Marc Gibson, the Kilopower lead engineer, the team will connect the power system to the core and begin end-to-end checkouts this month. Gibson says the experiments should conclude with a full-power test lasting approximately 28 hours in late March.

The Kilopower advantage

Fission power can provide abundant energy anywhere we want humans or robots to go. On Mars, the sun's power varies widely throughout the

seasons, and periodic dust storms can last for months. On the moon, the cold lunar night lingers for 14 days.

"We want a power source that can handle extreme environments," says Lee Mason, NASA's principal technologist for power and energy storage. "Kilopower opens up the full surface of Mars, including the northern latitudes where water may reside. On the moon, Kilopower could be deployed to help search for resources in permanently shadowed craters."

In these challenging environments, power generation from sunlight is difficult and fuel supply is limited. Kilopower is lightweight, reliable and efficient, which makes it just right for the job.

More information: For more information about the Kilopower project, visit www.nasa.gov/directorates/spacetech/kilopower

Provided by NASA

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