NASA plans to send a plutonium-packed rover to Mars

By KARL GROSSMAN

What is NASA’s future now that Atlantis has landed and the shuttle program is over? If NASA persists in using nuclear power in space, the agency’s future is threatened.

Between Nov. 25 and Dec. 15, NASA plans to launch for use on Mars a rover fueled with 10.6 pounds of plutonium, more plutonium than ever used on a rover.

The mission has a huge cost: $2.5 billion. But if there is an accident before the rover is well on its way to Mars, and plutonium is released on Earth, its cost stands to be yet more gargantuan.

NASA's Final Environmental Impact Statement for what it calls its Mars Science Laboratory Mission says that if plutonium is released on Earth, the cost could be as high as $1.5 billion to decontaminate each square mile of “mixed-use urban areas” impacted.

What’s the probability of an accident releasing plutonium? The NASA document says “the probability of an accident with a release of plutonium” is 1-in-220 “overall.”

If you knew your chance of not surviving an airplane flight — or just a drive in a car — was 1 in 220, would you take that trip?

And is this enormous risk necessary?

In two weeks, there will be a NASA mission demonstrating a clear alternative to atomic energy in space: solar power.

On Aug. 5, NASA plans to launch a solar-powered space probe, named Juno, to Jupiter.

There’s no atomic energy involved, although NASA for decades has insisted that nuclear power is necessary for space devices beyond the orbit of Mars. With Juno, NASA will be showing it had that wrong.

“Juno will provide answers to critical science questions about Jupiter, as well as key information of our own solar system,” says NASA on its Web site. “In 2016, the spinning, solar-powered Juno spacecraft will reach Jupiter.”

It will be equipped with “instruments that can sense the hidden world beneath Jupiter’s colorful clouds” and make 33 passes of Jupiter.

As notes Aviation Week & Space Technology: “The unique spacecraft will set a record by running on solar power rather than nuclear radioisotope thermoelectric generators previously used to operate spacecraft that far from the sun.”

The Mars rover to be launched, named Curiosity by NASA, will be equipped with these radioisotope thermoelectric generators using plutonium, the deadliest radioactive substance.

Juno, a large craft — 66 feet wide — will be powered by solar panels built by a Boeing subsidiary, Spectrolab. The panels can convert 28 percent of the sunlight that strikes them to electricity. They will also produce heat to keep Juno’s instruments warm.

In fact, Juno is not a wholly unique spacecraft. In 2004, the European Space Agency launched a space probe called Rosetta that is also solar-powered. Its mission is to orbit and land on a comet — beyond the orbit of Jupiter.

Moreover, there have been major developments in “solar sails” to propel spacecraft. Last year, the Japan Aerospace Exploration Agency launched its Ikaros spacecraft with solar sails taking it to Venus. In January, NASA itself launched its NanoSail-D spacecraft.

The Planetary Society has been developing several spacecraft that will take advantage of photons emitted by the sun to travel through the vacuum of space.

At no point will Juno (or the other solar spacecrafts) be a threat to life on Earth. This includes Juno posing no danger when in 2013 it makes a flyby of Earth. Such flybys, which make use of Earth’s gravity to increase a spacecraft’s velocity, have constituted dangerous maneuvers when in recent years they have involved plutonium-powered space probes such as NASA’s Galileo and Cassini probes.

Curiosity is a return to nuclear danger.

NASA’s Final Environmental Impact Statement admits that a large swath of Earth could be impacted by plutonium in an accident involving Curiosity. The document’s section on “Impacts of Radiological Releases” says “the affected environment” could include “the regional area near the Cape Canaveral Air Force Station and the global area.”

“Launch area accidents would initially release material into the regional area, defined … to be within … 62 miles of the launch pad,” says the document. This is an area from Cape Canaveral west to Orlando.

But “since some of the accidents result in the release of very fine particles less than a micron in diameter, a portion of such releases could be transported beyond … 62 miles,” it goes on. These particles could become “well-mixed in the troposphere” — the atmosphere five to nine miles high — and have been assumed to potentially affect persons living within a latitude band from approximately 23-degrees north to 30-degrees north. That’s a swath through the Caribbean, across North Africa and the Mideast, then India and China Hawaii and other Pacific islands, and Mexico and southern Texas.

Then, as the rocket propelling Curiosity gains altitude, the impact of an accident in which plutonium is released would be even broader.

The plutonium could affect people “anywhere between 28-degrees north and 28-degrees south latitude,” says the NASA document. That’s a band around the mid-section of the Earth including much of South America, Africa and Australia.

Dr. Helen Caldicott, president emeritus of Physicians for Social Responsibility, has long emphasized that a pound of plutonium, if

Unlike the plutonium-fueled rover Curiosity, which NASA plans to send to Mars between Nov. 25 and Dec. 15, NASA’s Juno (left) is a solar-powered probe, headed for Jupiter on Aug. 5. “NASA for decades has insisted that nuclear power is necessary for space devices beyond the orbit of Mars,” Grossman writes. “With Juno, NASA will be showing it had that wrong.”

In 1964, the plutonium system aboard a satellite failed to achieve orbit and dropped to Earth, disintegrating as it fell. The 2.1 pounds of plutonium dispersed widely over the Earth has long been linked to an increase in global lung cancer.
Irresponsible
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uniformly distributed, could hypothetically give a fatal dose of lung cancer to every person on Earth. A pound, even 10.6 pounds, could never be that uniformly distributed, of course. But an accident in which plutonium is released by a space device as tiny particles falling to Earth maximizes its lethality. A millionth of a gram of plutonium can be a fatal dose.

As the NASA Environmental Impact Statement puts it: “Particles smaller than about 5 microns would be transported to and remain in the trachea, bronchi or deep lung regions.” The plutonium particles “would continuously irradiate lung tissue.”

“A small fraction would be transported over time directly to the blood or to lymph nodes and then to the blood,” it continues. Once plutonium “has entered the blood via ingestion or inhalation, it would circulate and be deposited primarily in the liver and skeletal system.” Also, says the document, some of the plutonium would migrate to the testes or ovaries.

The cost of decontamination of areas affected by the plutonium could be, according to the NASA statement, $267 million for each square mile of farmland, $478 million for each square mile of forests and $1.5 billion for each square mile of “mixed-use urban areas.”

The NASA document lists “secondary social costs associated with the decontamination and mitigation activities” as: “Temporary or longer term relocation of residents; temporary or longer term loss of employment; destruction or quarantine of agricultural products including citrus crops; land use restrictions; restrictions which could affect real estate values, tourism and recreational activities; restrictions or bans on commercial fishing; and public health effects and medical care.”

Why use a plutonium-powered rover on Mars, considering that NASA has successfully used solar-powered rovers on that planet? The NASA Environmental Impact Statement says that a “solar-powered rover…would not be capable of operating over the full range of scientifically desirable landing site latitudes” on this mission.

There’s more to it. For many decades there has been a marriage of nuclear power and space at NASA. The use of nuclear power on space missions has been heavily promoted by the U.S. Department of Energy (DOE) and its predecessor agency, the U.S. Atomic Energy Commission, and the many DOE (previously AEC) national laboratories including Los Alamos and Oak Ridge. This initiative provides work for these government entities. Also, the manufacturers of nuclear-powered space devices — General Electric was a pioneer — have pushed their products. Further, NASA has sought to coordinate its activities with the U.S. military. The military for decades has planned for the deployment of nuclear-powered weapons in space.

Personifying the NASA-military connection now is NASA Administrator Charles Bolden, a former NASA astronaut and Marine Corps major general. Appointed by President Barack Obama, he is a booster of radioisotope thermoelectric generators as well as rockets using nuclear power for propulsion. The U.S. has spent billions of dollars through the years on such rockets, but none have ever taken off and the programs have all ended up cancelled, largely out of concern about a nuclear-powered rocket blowing up on launch or falling back to Earth.

Accidents have happened in the U.S. space nuclear program. Of the 26 space missions using plutonium that are listed in the NASA Environmental Impact Statement Station — are solar-powered.

There was also a near-miss involving a nuclear disaster and a space shuttle. The next mission of the ill-fated Challenger was supposed to carry up a space probe with 25 pounds of plutonium.

The NASA Environmental Impact Statement includes comments from several people and organizations, some highly critical of a plutonium-powered Mars Science Laboratory Mission.

Leah Karpen of Asheville, N.C., says: “Every expansion of plutonium research, development and transportation of this deadly material increases the risk of nuclear accident or theft. In addition, plutonium production is expensive and diverts resources from the more important social needs of our society today, and in the future.” She urges NASA “to reconsider the use of nuclear” and go with solar instead.

Jeremy Maxand, executive director of the Idaho-based Snake River Alliance, calls on NASA and the DOE to “take this opportunity to move space exploration in a sustainable direction with regard to power. Using solar rather than nuclear to power the Mars Science Laboratory Mission would keep the U.S. safe, advance energy technologies that are cleaner and more secure, be more fiscally responsible, and set a responsible example for the Mars Science Laboratory Mission, three underneath accidents, admits the document.

The worst occurred in 1964 and involved, it notes, the SNAP-9A plutonium system aboard a satellite that failed to achieve orbit and dropped to Earth, disintegrating as it fell. The 2.1 pounds of plutonium fuel dispersed widely over the Earth, and Dr. John Gofman, professor of medical physics at the University of California at Berkeley, long linked this accident to an increase in global lung cancer. With the SNAP-9A accident, NASA switched to solar energy on satellites. Now all satellites — and the International Space Station — are solar-powered.

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The Chabad Lubavitch of the Hamptons held its First Annual Twilight Cocktail Reception on July 17 at the home of Roberta Leibowitz in Watermill. Rabbi Leibel Baumgarten and his wife, Goldie, were honored for their efforts in establishing the Chabad community in East Hampton. The reception included specialty food stations, music, raffles and a silent auction. Prior to the event, Rabbi Leibel Baumgarten said, “This is our seventh-year anniversary as an established Chabad — but actually I’ve been in the area for 25 years, conducting services from house to house, everywhere from Amagansett to Bridgehampton to Wainscott.”

He added, “We saw a community growing and it was time to establish ourselves here further.”

Says Gagnon: “The taxpayers are being asked once again to pay for nuclear missions that could endanger the life of all the people on the planet. ... Have we not learned anything from Chernobyl and Fukushima? We don’t need to be launching nukes into space. It’s not a gamble we can afford to take.”

With the return of Atlantis and end of the shuttle program, there are concerns about this being the “end” of the U.S. space program.

An accident that happens if NASA continues to insist on mixing atomic energy and space — a nuclear disaster overhead — that, indeed, could end the space program.


The dinner will benefit the many projects and activities of the Chabad of Southampton Jewish Center. Among them are The Siggi Wilzig Hamptons Jewish Children’s Center; Camp Gan Israel Southampton; Hamptons Jewish Seniors Club and Chabad Culture Club; Mommy and Me; Kabbalah in the Hamptons; Hanukkah, Purim and Sukkot Parties; and Hebrew Reading for Adults.

The Chabad is currently holding a “Kabbalah in the Hamptons” class, Sundays at 11 a.m. And on Aug. 12, 10:30 a.m.-1 p.m., the Chabad will hold its annual Hampton Jewish Childrens’ Carnival at the Montessori School in Southampton. And for those who do not have a house in the Hamptons: The Village Latch and the Southampton Inn, both with Hill Street addresses, are in brief walking distance of the Chabad. In fact, last year, due to the increase in attendance Konikov mentioned, the Chabad held some High Holy Day services at the inn. In a sense, things have come full circle from those years in the early ’90s when the Chabad was first offering its services in Southampton.