Space

ISS remains at risk

NASA seeks ideas for nuke reactor on moon

BOISE, Idaho, Nov 20, (AP): If anyone has a good idea on how to put a nuclear fission power plant on the moon, the US government wants to hear about it.

NASA and the nation's top federal nuclear research lab on Friday put out a request for proposals for a fission surface power system.

NASA is collaborating with the US Department of Energy's Idaho National Laboratory to establish a sun-independent power source for missions to the moon by the end of the decade.

"Providing a reliable, high-power system on the moon is a vital next step in human space exploration, and achieving it is within our grasp," Sebastian Corbisiero, the Fission Surface Power Project lead at the lab, said in a statement.

Reuter

If successful in supporting a sustained human presence on the moon, the next objective would be Mars. NASA says fission surface power could provide sustained, abundant power no matter the environmental conditions on the moon or Mars.

"I expect fission surface power systems to greatly benefit our plans for power architectures for the moon and Mars and even drive innovation for uses here on Earth," **Jim Reuter**, associate administrator for NASA's Space Technology Mission Directorate, said in a statement.

The reactor would be built on Earth and then sent to the moon.

Submitted plans for the fission surface power system should include a uranium-fueled reactor core, a system to convert the nuclear power into usable energy, a thermal management system to keep the reactor cool, and a distribution system providing no less than 40 kilowatts of continuous electric power for 10 years in the lunar environment.

Some other requirements include that it be capable of turning itself off and on without human help, that it be able to operate from the deck of a lunar lander, and that it can be removed from the lander and run on a mobile system and be transported to a different lunar site for operation.

Additionally, when launched from Earth to the moon, it should fit inside a 12-foot (4-meter) diameter cylinder that's 18 feet (6 meters) long. It should not weigh more than 13,200 pounds (6,000 kilograms).

The proposal requests are for an initial system design and must be submitted by Feb. 19.

The Idaho National Laboratory has worked with NASA on various projects in the past. Most recently, the lab helped power NASA's Mars rover Perseverance with a radioisotope power system, which converts heat generated by the natural decay of plutonium-238 into electrical power.

The car-sized rover landed on Mars in February and has remained active on the red planet.

The Energy Department has also been working to team up with private businesses on various nuclear power plans, notably on a new generation of smaller power plants that range from small modular reactors to small mobile reactors that can quickly be set up in the field and then removed when not needed.

Meanwhile, the International Space Station remains at increased risk from orbiting debris following this week's Russian weapons test, NASA said Thursday.

On Monday, Russia launched a missile to destroy a satellite orbiting just above the space station.

NASA said late Wednesday that the highest threat to the station and its seven residents was in the first 24 hours. Hatches between many of the station compartments were closed as a precaution, but they were reopened Wednesday.

The US Space Command is tracking more than 1,500 satellite fragments, but hundreds of thousands of pieces are too small to see. NASA and the State Department have condemned the missile strike, saying it also puts satellites and China's space station at risk.

NASA said it's reviewing an upcoming spacewalk and other station operations, to assess the risks before proceeding. The spacewalk to replace a bad antenna is targeted for Nov. 30. The space agency also plans continued inspections for potential damage.

The space station currently is home to four Americans, two Russians and one German.

Russian officials on Tuesday rejected accusations that they endangered astronauts aboard the International Space Station by conducting a weapons test that created more than 1,500 pieces of space junk but a White House official said the move by Russia would threaten activities in space "for years to come."

US officials on Monday accused Russia of destroying an old satellite with a missile in what they called a reckless and irresponsible strike. They said the debris could damage the space station, an assessment backed by NATO's chief.

Astronauts now face four times greater risk than normal from space junk, NASA Administrator Bill Nelson told The Associated Press. The defunct Russian satellite Cosmos 1408 was orbiting about 40 miles (65 kilometers) higher than the space station.

The test clearly demonstrates that Russia, "despite its claims of opposing the weaponization of outer space, is willing to ... imperil the exploration and use of outer space by all nations through its reckless and irresponsible behavior," US Secretary of State Antony Blinken said.

Also:

CAPE CANAVERAL, Fla.: SpaceX founder **Elon Musk** said Wednesday that his company will attempt to launch its futuristic, bullet-shaped Starship to orbit in January, but he's not betting on success for that first test flight.

"There's a lot of risk associated with this first launch, so I would not say that it is likely to be successful, but we'll make a lot of progress," he said during a virtual meeting organized by the National Academy of Sciences.

Musk said he's confident Starship — launching for the first time atop a mega booster — will successfully reach orbit sometime in 2022. After a dozen or so orbital test flights next year, SpaceX then would start launching valuable satellites and other payloads to orbit on Starships in 2023, he said.

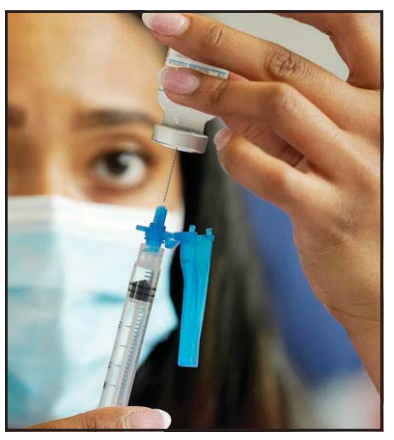
NASA has contracted with SpaceX to use Starship for delivering astronauts to the lunar surface as early as 2025. Musk plans to use the reusable ships to eventually land people on Mars.

The shiny, stainless steel Starship and its first-stage booster — called the Super Heavy — will be the biggest rocket ever to fly, towering 394 feet (120 meters). Liftoff thrust, Musk noted, will be more than double that of NASA's Saturn V rockets that carried astronauts to the moon a half-century ago.

The Super Heavy has yet to soar. But a full-scale Starship model in May flew to an altitude of more than 6 miles (10 kilometers) before successfully landing back at the SpaceX complex near Texas' southernmost tip.

The Starship and Super Heavy for the first orbital test flight have both been completed, according to Musk. By the end of November, the company hopes to be finished with the launch pad and tower, with testing in December. The Federal Aviation Administration should be done by the end of the year with its review, leading to a launch in January or February at the latest, Musk noted.

A pregnant and intubated COVID-19 patient sits in the Surgical Intensive care unit (SICU) at St. Luke's Boise Medical Center in Boise, Idaho on Tuesday, Aug. 31, 2021. Pregnant women with COVID face increased chances for stillbirths and that risk spikes to four times higher with the delta variant compared with uninfected women, new CDC data show. (AP)



Licensed practical nurse Yokasta Castro, of Warwick, R.I., draws a Moderna COVID-19 vaccine into a syringe at a mass vaccination clinic, May 19, 2021, at Gillette Stadium, in Foxborough, Mass. US regulators have opened up COVID-19 booster shots to all and more adults, Friday, Nov. 19, letting them choose another dose of either the Pfizer or Moderna vaccine. (AP)

Buffett

Tedros

Discovery

New Delhi air still 'very poor': Air pollution remained extremely high in the Indian capital on Thursday, a day after authorities closed schools indefinitely and shut some power stations to reduce smog that has blanketed the city for much of the month.

New Delhi's air quality remained "very poor," according to SAFAR, India's main environmental monitoring agency. The concentration of tiny airborne particles less than 2.5 microns in diameter — known as PM 2.5 — neared 300 micrograms per cubic meter in some parts of the city, it said.

The World Health Organization designates the maximum safe level as 25. The tiny particles can lodge in the lungs and other organs, causing long-term health damage.

New Delhi, a city of 20 million, is one of the world's most polluted cities. Air quality often hits hazardous levels during the winter, when the burning of crop residue in neighboring states coincides with lower temperatures that trap smoke. The smoke travels to New Delhi, obscuring the sky.

Emergency measures went into effect on Wednesday in an attempt to stem the health crisis.

Schools were closed indefinitely and employees were asked to allow half of their staff to work from home for a week. Some coal-based power stations outside New Delhi were ordered to shut down and construction activities were halted.

The measures, however, are expected to have very little effect.

Meanwhile, the New Delhi state government is weighing whether to lock down the capital after India's Supreme Court last week sought an "imminent and emergency" action plan to tackle the crisis.

The PM 2.5 concentration has soared to nearly 15 times above the WHO's safe level on many days in November and forecasters warn the pollution is likely to get worse in the coming days.

New Delhi's pollution woes are due to various causes. WHO chief is**Tedros Adhanom Ghebreyesus**.

Auto emissions contribute nearly 25% of the city's pollution in the winter, according to the federal government. Other sources of air pollution include emissions from industries, smoke from firecrackers linked to festivals, construction dust and agricultural burning.

Several studies have estimated that more than a million Indians die each year from air pollution-related diseases.

In 2020, 13 of the world's 15 cities with the most polluted air were in India, according to the Swiss air quality monitoring company IQAir. (AP)

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Fla tops 1K manatee deaths: More than 1,000 manatees have died in Florida so far this year, eclipsing a previous annual record as the threatened marine mammals struggle with starvation due to pollution in the water.

The Florida Fish and Wildlife Conservation Commission reported the updated total on Wednesday. The 1,003 manatee deaths so far in 2021 is many more than the 637 recorded last year and well above the previous mark of 830 set in 2013.

A motorcyclist drives on the wrong side of the road amidst morning haze and toxic smog in New Delhi, India, Wednesday, Nov. 17. Schools were closed indefinitely and some coal-based power plants shut down as the Indian capital and neighboring states invoked harsh measures last Wednesday to combat air pollution after an order from the federal environment ministry panel. (AP)

Slow-moving, bulky manatees have long struggled to coexist with humans. Boat strikes account for some deaths and many injuries. But state officials and environmental groups say polluted water runoff from agriculture, sewage and other man-made development has caused algae blooms in estuaries, choking off the seagrass upon which manatees rely. Climate change is worsening the problem.

Authorities expected another bad year for manatees, with more deaths to come as Florida enters the winter months when the animals congregate in warm-water areas where food supplies have dwindled. Seagrass beds on the state's eastern coast have been hit especially hard.

To compound the problem, manatees are slow to reproduce. According to the nonprofit Save the Manatee Club — co-founded by Florida troubadour **Jimmy Buffett** — one calf is born every two to five years after a manatee reaches sexual maturity at about age 5. Twin births are rare.

"Manatees are in serious trouble," ZooTampa at Lowry Park, one of four main manatee critical care centers in Florida, said in a statement. "The loss of more than 1,000 manatees this year is deeply concerning and will have serious repercussions for years to come."

The commission is asking state lawmakers to approve $7 million in the upcoming legislative session for seagrass restoration, manatee rehabilitation centers and other projects. Lawmakers approved $8 million last year. (AP)

Coronavirus

US opens boosters to all adults, urges them for 50+

'COVID in pregnancy tied to stillbirths'

NEW YORK, Nov 20, (AP): Pregnant women with COVID-19 face increased chances for stillbirths compared with uninfected women, and that risk spiked to four times higher after the delta variant emerged, new government data show.

The federal Centers for Disease Control and Prevention released a report Friday that examined 1.2 million deliveries in 736 hospitals nationwide from March 2020 through September 2021.

Stillbirths were rare overall, totaling 8,154 among all deliveries. But the researchers found that for women with COVID-19, about 1 in 80 deliveries resulted in stillbirth. Among the uninfected, it was 1 in 155.

Among those with COVID-19, stillbirths were more common in people with chronic high blood pressure and other complications, including those in intensive care or on breathing machines.

"These findings underscore the importance of COVID-19 prevention strategies, including vaccination before or during pregnancy," CDC researcher Carla DeSisto and co-authors said.

There's no information on how many had received COVID-19 shots, although the authors noted that the U.S. vaccination rate among pregnant people after delta emerged this past summer was 30%.

Pregnant people with COVID-19 are more likely than others to develop severe, even fatal, illness and they face increased risks for preterm birth and other complications. Previous studies on stillbirths and COVID-19 had mixed findings, but the report bolsters concerns among obstetricians and anecdotal data.

While the absolute risk for stillbirth is low, anyone who is pregnant shouldn't underestimate the dangers of COVID-19, said Dr. Mark Turrentine, a professor at Baylor College of Medicine in Houston. He helped write the American College of Obstetricians and Gynecologists' recommendations for COVID-19 vaccination in pregnancy.

"What's really sad is we have 10 months of a vaccine that's been highly effective and we just can't convince people to take advantage of this," Turrentine said.

Some experts have speculated that the virus may cause inflammation in the placenta or other abnormalities that could harm the fetus.

Dr. Joseph Biggio, a specialist in high-risk pregnancies at Ochsner Health in New Orleans, said the study doesn't prove that COVID-19 caused stillbirths. He said it's possible some women were so critically ill that physicians trying to keep them alive "couldn't intervene on behalf of a fetus that they knew was in trouble."

The researchers relied on medical records, and they noted that they were unable to determine if the COVID-19 diagnoses listed at the time of delivery represented current or past infections.

Generally, stillbirths are more common among Black people, those who become pregnant over age 35 or those who smoke tobacco during pregnancy.

The study didn't include pregnancy outcomes by race, an area the authors said they plan to investigate in future research "because COVID-19 has disproportionately affected many racial and ethnic minority groups, putting them more at risk of getting sick and dying."

The US on Friday opened COVID-19 booster shots to all adults and took the extra step of urging people 50 and older to seek one, aiming to ward off a winter surge as coronavirus cases rise even before millions of Americans travel for the holidays.

Eligible

Until now, Americans faced a confusing list of who was eligible for a booster that varied by age, their health and which kind of vaccine they got first. The Food and Drug Administration authorized changes to Pfizer and Moderna boosters to make it easier.

Under the new rules, anyone 18 or older can choose either a Pfizer or Moderna booster six months after their last dose. For anyone who got the single-dose Johnson & Johnson vaccine, the wait already was just two months. And people can mix-and-match boosters from any company.

"We heard loud and clear that people needed something simpler — and this, I think, is simple," FDA vaccine chief Dr. Peter Marks told The Associated Press.

The Centers for Disease Control and Prevention had to agree before the new policy became official late Friday. CDC Director Dr. Rochelle Walensky endorsed a recommendation from her agency's scientific advisers that — in addition to offering all adults a booster — had stressed that people 50 and older should be urged to get one.

"It's a stronger recommendation," said CDC adviser Dr. Matthew Daley of Kaiser Permanente Colorado. "I want to make sure we provide as much protection as we can."

The CDC also put out a plea for those who had previously qualified but hadn't yet signed up for a booster to quit putting it off - saying older Americans and people with risks such as obesity, diabetes or other health problems should try to get one before the holidays.

The expansion makes tens of millions more Americans eligible for an extra dose of protection.

The No. 1 priority for the U.S., and the world, still is to get more unvaccinated people their first doses. All three COVID-19 vaccines used in the U.S. continue to offer strong protection against severe illness, including hospitalization and death, without a booster.

But protection against infection can wane with time, and the U.S. and many countries in Europe also are grappling with how widely to recommend boosters as they fight a winter wave of new cases. In the U.S., COVID-19 diagnoses have climbed steadily over the last three weeks, especially in states where colder weather already has driven people indoors.

And about a dozen states didn't wait for federal officials to act before opening boosters to all adults.

"The direction is not a good one. People are going inside more and, 'oops,' next week happens to be the largest travel week of the year, so it probably makes sense to do whatever we can here to try to turn the tide," Marks told the AP.

Vaccinations began in the U.S. last December, about a year after the coronavirus first emerged. More than 195 million Americans are now fully vaccinated, defined as having received two doses of the Pfizer or Moderna vaccines or the single-dose J&J. More than 32 million already have received a booster, a large proportion — 17 million — people 65 or older. Experts say that's reassuring as seniors are at particularly high risk from COVID-19 and were among the first in line for initial vaccinations

Teen boosters aren't yet under discussion, and kid-sized doses of Pfizer's vaccine are just now rolling out to children ages 5 to 11.

The Biden administration had originally planned on boosters for all adults but until now, U.S. health authorities - backed by their scientific advisers - had questioned the need for such a widespread campaign. Instead, they first endorsed Pfizer or Moderna boosters only for vulnerable groups such as older Americans or those at high risk of COVID-19 because of health problems, their jobs or their living conditions.