Dry ice vacuum cleaner robot bound for Fukushima

YOKOHAMA — A remote controlled robot that uses dry ice to vacuum up radiation was unveiled by Japanese researchers on Friday, the latest innovation to help the clean-up at Fukushima.

The caterpillar-tracked device blasts dry ice—frozen CO2—against floors and walls, evaporating and carrying radioactive substances with it, engineers said. The nozzle also sucks up the resulting gases.

The robot has two boxy machines the size of large refrigerators and moves on crawlers that are remotely controlled. Each machine has four cameras that allow the device to “see” what it is doing, an engineer told reporters.

“As the machine blasts tiny grains of dry ice against the surface, the impact of it as well as the energy of evaporation help detach radiological substances,” said Tadasu Yotsuyanagi of Toshiba, which developed the robot.

“Since dry ice immediately gets sublimated into gas, it itself does not produce contaminated waste,” he said, adding the technology was developed initially to scrape paint off airplanes.

The robot can theoretically clean a space of up to two square meters per hour, but the current system can only hold enough dry ice for half an hour.

The engineers will test the robot first at a separate nuclear plant this month, aiming to introduce it to the battered Fukushima nuclear plant this summer, Yotsuyanagi said.

The massive earthquake and tsunami of March 11, 2011, sparked an atomic emergency at the Fukushima Daiichi plant in the northeast of the country.

Efforts to clear up after the nuclear disaster are still continuing, with high levels of radiation hampering operations.

The decommissioning of the crippled plant is expected to take several decades.

Toshiba in November unveiled a remote-controlled robot resembling a headless dog that they also hoped to use at the Fukushima power plant.

The tetrapod, which weighed 65 kilograms and was about one meter tall, was designed to be able to cover difficult terrain—such as going up steep steps—that regular robots struggle with.

In December, it successfully photographed some of the critical part of the plant’s No. 2 reactor, where high radiation makes it impossible for workers to walk in.

But when it was sent for more inspection for the second time, it was hit by a series of defects, including falling backward on steps, the company said.
This is a great start and something positive to talk about in regards to radiation.

Very good for decontamination of materials and equipment but a hovercraft type vehicle is almost needed to go over terrain and capture these radio-active particles.

who is going to clean the machine... and add dry ice every half hour... why dont they let prisoners volunteer to do some clean up... where does radiation go... it must blow downwind... I know of a ranch where people from Sendai can come in Hawaii if they have skills and want to get out of this crazy place for a while...

I imagine this thing moves pretty slow given the size of it. They need to connect some kind of tube to it so it can keep working, otherwise the dry ice will evaporate before it gets anywhere useful.

I hope it's effective, but does it really work or is it just another Japanese gadget soon to be forgotten.

where does radiation go
In the local rivers, of course. That's where the contractors have been dumping it, in case you missed the Asahi article.

Just another Japanese gadget soon to be forgotten.
Just another excuse not to buy foreign technology, and waste time and money in the process.

where does radiation go.. it does not just evaporate... it must blow downwind...
From the article if you read it...
The caterpillar-tracked device blasts dry ice—frozen CO2—against floors and walls, evaporating and carrying radioactive substances with it, engineers said. The nozzle also sucks up the resulting gases.

Yubaru: Yes, it says the robot sucks up the gases via the nozzle, but it doesn’t say where the radiation will end up as a result, hence the ‘local rivers’ joke above, I believe.

Anyway, sounds like they’ve got a lot of work to do before these robots can achieve their intended purpose, but it’s a good start.

The radiation levels at many locations inside the atomic plant remains dangerously high. Workers were able to remove the debris from the top floors of the No4 reactor because the reactor was empty when the disaster struck. Different story removing the debris from the No3 reactor with dangerous radiation levels and can only be done with remote controlled cranes and cutters. The radiation levels inside reactors No1&2 remains very high, and already three robots were fried inside there. The radiation level in the reactor basements is measure in single digits but also in sieverts/hour. The removed of the melted fuel, if its to happen will involve the use of robots.

TEPCO will need many kinds of robots, especially ones that don’t get fried with the radiation.
wanderlust  FEB. 16, 2013 - 08:43PM JST
Marginaly less ridiculous than the Japanese Mayor who claimed that burning radioactive materials destroyed the radiation!

And having seen the stairwells, doorways and corridors inside Japanese NPPs, and considering that many are still full of rubble and steel, this robot, if it even works on site, will have a tough job getting around.

Ichiro20  FEB. 16, 2013 - 10:00PM JST
This is a very awesome invention.

Open Minded  FEB. 17, 2013 - 12:30AM JST
About 20*20 km have been heavily contaminated; i.e., 400,000,000 sqm. That is to say it will take 22,800 years to decontaminate it for one robot, assuming flat and clear area. What a progress!

Open Minded  FEB. 17, 2013 - 12:36AM JST
Bottom line: don't waste engineering resources to clean up this cr%&*#p but use it to develop energy saving, conservation, ... so that we can minimize NPP and non renewable energy sources.

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