

Nets, harpoons could be used to haul in space junk (Update)

25 April 2013, by Frank Jordans

Nets, harpoons and suicide robots could become weapons of choice to hunt down the space junk threatening crucial communications satellites currently in orbit round Earth, scientists said Thursday.

Even lasers that act like "Star Trek" tractor beams were among the proposals put forward to protect some \$100 billion worth of satellites from man-made cosmic garbage.

"Whatever we do is going to be an expensive solution," Heiner Klinkrad, a space debris expert at the European Space Agency, said at the end of an international conference on space debris in Darmstadt, Germany. "But one has to compare the costs of what we are investing to solve the problem as compared to losing the infrastructure that we have in orbit."

Experts estimate that about 27,000 objects measuring 10 centimeters (4 inches) or more are flying through orbit at 80 times the speed of a passenger jet, Klinkrad said. Each one of those could destroy a satellite. And even vastly smaller debris of just 1 millimeter—of which there are about 160 million—can render sensitive space instruments useless.

Thomas Schildknecht, an astronomer at the University of Bern, Switzerland, said it would be technically feasible to send a satellite into space to capture objects with a net and harpoon.

But more elaborate proposals could also work, Schildknecht said. These include a satellite firing electrically charged atoms—or ions—at an object to gradually slow it down and thereby drag it back to Earth.

Ground-based lasers could be used in the same way, though only for very small objects, he said.

For larger objects like ESA's 18,000-pound

(8,100-kilogram) Envisat, which broke down last year, a dedicated robot could be built which would be sent on a suicide mission to bring the satellite down safely. Such missions could cost up to \$200 million each.

"I'm confident that we will see demonstration missions in the near future," said Schildknecht.

ESA says testing of new technologies for cleaning up space needs to start soon because the amount of junk spinning uncontrollably through orbit is growing.

Concerns about the risk of space junk increased in 2007, when China's military shot down one of the country's defunct weather satellites in a show of force, inadvertently spraying orbit with thousands of pieces of debris.

Klinkrad said 5-10 large objects need to be collected each year to prevent what is known as the Kessler Syndrome—when a few major collisions trigger a cascade effect in which each crash vastly increases the amount of dangerous debris in orbit.

So far, major collisions have been rare. In 2009, a private communications satellite called Iridium 33 smashed into the Russian military satellite Kosmos-2251, destroying both in the process. Scientists say it's only a matter of time before the next one occurs, and smaller debris may pose the biggest danger because they are harder to track.

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