



Ten Stories the World Should Hear More About

Space debris:

Orbiting debris threatens sustainable use of outer space



A crash of two orbiting satellites in February 2009 resulted in a cloud of space debris that could threaten spacecraft and astronauts for decades. 2009. Analytical Graphics, Inc.

Far above the earth, orbiting satellites play a crucial role in our everyday lives – powering countless services ranging from cell phones to banking, weather reports and navigation. Taken largely for granted, these modern conveniences are actually in constant peril, due to potential collisions with accumulating outer space debris left by defunct satellites and other spacecraft. In 2008, countries at the UN adopted space debris mitigation guidelines to curb the pollution of outer space and promote international consensus on acceptable spacecraft operations so that outer space may be used in a sustainable way.

The Story

Some one thousand operational satellites, belonging to more than 40 countries, are now in orbit around the earth, providing weather, mapping, communications and other basic services that are vital to our way of life. But just as human activities on earth generate mountains of waste, the increasing traffic of satellites in outer space has created growing amounts of debris that are in constant danger of colliding and disrupting these services. In May 1998, the malfunctioning of a single satellite abruptly cut off communications services in North America, silencing about 40 million pagers, blocking automated teller

machines and credit card payments, and forcing radio and television networks off the air.

Defunct satellites and other debris that remain in orbit for a considerable length of time have made the space environment more dangerous, threatening astronauts, operating satellites and other spacecraft. According to the Center for Orbital and Reentry Debris Studies, a piece of metal space junk the size of a tennis ball is as lethal as 25 sticks of dynamite. A 2008 report by the international monitoring group Space Security Index found there are 300,000 objects measuring 1-10 cm in diameter orbiting the Earth at speeds that can reach many thousands of kilometers per hour, so even the smallest debris have the potential to damage or destroy a spacecraft.

In February 2009, the first major collision of two satellites in orbit – the defunct Russian communications satellite Cosmos 2251 and the operational US satellite Iridium 33, each weighing more than 1,000 pounds and going 17,500 miles an hour – created a cloud of nearly 700 pieces of space debris that could threaten orbiting spacecraft for decades. The crew of the International Space Station took shelter in the Russian Soyuz capsule after a near collision with a piece of space debris just 1cm in size. The collision and numerous near-misses have prompted renewed calls for an international law that would make it mandatory to dispose of defunct satellites.

The UN General Assembly in 2008 adopted resolution 62/217, endorsing the Space Debris Mitigation Guidelines of the Committee on the Peaceful Uses of Outer Space. The voluntary guidelines outline space debris mitigation measures for the planning, design, manufacture and operational phases of spacecraft and launch vehicles. The guidelines call for limiting the long-term presence of spacecraft in low-Earth orbit (LEO), up to some 1,600 kilometers (1,000 miles) above Earth's surface, after the end of their mission. The guidelines call for the removal of such spacecraft from orbit or for their disposal in other orbits that avoid their long-term presence in the LEO region, where the majority of satellites are placed and where they are in greatest danger of collision.

“The prompt implementation of appropriate space debris mitigation measures is in humanity's common interest, particularly if we are to preserve the outer space environment for future generations,” says, Mazlan Othman, Director of the UN Office for Outer Space Affairs (UNOOSA). The willingness of countries to implement these guidelines holds the key to sustainable use of outer space but the fact that political consensus was reached is a critical starting point acknowledging that space debris cannot be left to just scientists and astronauts.

The Context

- The Space Debris Mitigation Guidelines of the United Nations Committee on the Peaceful Uses of Outer Space (A/62/20) aim to curtail the generation of potentially harmful space debris and prevent further pollution of the space environment.
- Space debris mitigation measures are divided into two broad categories – those that curtail the generation of potentially harmful space debris in the near term and those that limit their generation over the longer term.
- According to NASA, the February 2009 satellite collision was the first time two spacecraft ran into each other. Previously there have been four other minor space collisions involving parts of spent rockets or small satellites.
- The Committee on the Peaceful Uses of Outer Space (COPUOS), set up by the General Assembly in 1959, promotes international cooperation in the peaceful uses of outer space and develops legal

frameworks to address problems arising from the exploration and use of outer space. Since its inception, COPUOS has concluded five major international treaties and five sets of legal principles governing outer space activities.

- Satellites and other spacecraft have become an indispensable part of the world's infrastructure, playing a crucial role in international development, security, and environmental monitoring and protection.

FOR FURTHER INFORMATION:

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USEFUL WEB LINKS:

United Nations Office for Outer Space Affairs

<http://www.unoosa.org>

Report of the Committee on the Peaceful Uses of Outer Space

[http://www.un.org/Docs/journal/asp/ws.asp?m=A/62/20 \(SUPP\)](http://www.un.org/Docs/journal/asp/ws.asp?m=A/62/20 (SUPP))

"Space Solutions for the World's Problems: How the United Nations family uses space technology to achieve development goals" <http://www.uncosa.unvienna.org/pdf/reports/IAM2006E.pdf>

Gateway to space-related activities of the UN system

<http://www.uncosa.unvienna.org/uncosa/en/index.html>

UN News Centre

www.un.org/News

Inter-Agency Space Debris Coordination Committee

<http://www.iadc-online.org/>

NASA Orbital Debris Program Office

<http://www.orbitaldebris.jsc.nasa.gov/>

European Space Agency: Space Debris Office

http://www.esa.int/SPECIALS/Space_Debris/index.html