

Association of Space Explorers

General Statement on Space Traffic Management and Space Debris Objects

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Since the beginning of space flight, the collision hazard in Earth orbit has significantly increased as the number of artificial objects orbiting the Earth has increased. Today, at the 31st Global Congress of the Association of Space Explorers (ASE), the membership, representing astronauts and cosmonauts from 38 nations, unanimously approved the following sense of the organization regarding the tracking and future management of space debris objects.

ASE works closely with other space organizations to expand and invigorate international dialogue on such issues as crew safety, operational compatibility, and the potential hazards of near earth objects. ASE regularly sponsors international discussions among astronauts and cosmonauts on operations challenges in space. Operations in earth orbit have dramatically increased over the years to where Space Traffic Management (STM) is now required to de-conflict the flight paths of over 1,900 satellites. In the early aviation environment and the growth of the airplane industry, it became necessary to develop international protocols and policies to manage the “air traffic” in order to promote safety and to bring order to the growing industry. But management of “space traffic” is complicated by the need to include space debris objects, which like the satellites themselves, are traveling at speeds measured in kilometers per second. Past efforts to track space debris objects focused on the largest objects in orbit which added about 27,000 items to the combined catalog. Recent studies suggest objects as small as a few millimeters should be considered “lethal” space debris to an active satellite. Taking all of these into consideration when performing conjunction analyses would involve a catalog of over 500,000 space debris objects.

Major space objects (functioning spacecraft as well as space debris objects) weighing 50-100 kilograms and more contain a bulk of material that can potentially lead to new space debris objects emerging in case of a collision. We should pay attention to the nearly exponential growth in space debris objects, small-sats, cubesats, and spent rocket bodies that without an international global management structure could result in inadvertent impacts to human missions, or even tragic accidents. The ASE supports and applauds the growth of the space enterprise as we use small-sats to study the Earth, Moon and Mars. However, collisions by uncontrolled and unmanaged space assets create space debris objects which can remain in orbit for years, travelling at many thousands of kilometers per hour. One could even imagine a time in which human launches could not be scheduled for fear of an impact. Even now, spaceflight launches are occasionally delayed due to the possibility of collision with space debris objects.

Because of possible negative impacts to space operations, space debris object discussions and decisions (such as active removal, orbital management, deflection, etc.) should be conducted within the framework of negotiated international regulations and procedures. For example, as a first step towards clearing space in the future, international procedures should be developed for classifying identified tracked space debris objects, both registered and unregistered, as space debris and for establishing a unified catalog of space debris objects.

The ASE urges the international spacefaring nations to rapidly develop policies, technologies, protocols and/or treaties on Space Traffic Management (STM) in Low Earth Orbit (LEO) that would assess impact risk from space debris objects. Development of a US Space Traffic Management (STM) structure is a first step, but the US is only one element of a growing international launch market. Space debris objects know no international boundaries, travelling around the planet in about 90 minutes each orbit (~17,500 mph or ~28,164 km/h). Similar to the history of aviation and maritime operations, the international space sector should collaborate in order to keep the doors of space open and safe for everyone.

References:

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