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CONSIDERATIONS FOR THE LONG-TERM SUSTAINABILITY OF OUTER SPACE ACTIVITIES

**Abstract**

Since the first artificial satellite, SPUTNIK, was launched in 1957, number of man-made objects has been increased gradually toward year 2000 time frame. China conducted ASAT in 2007 and US satellite iridium and Russian metrological satellite were crashed in 2009 so that those caused dramatically increased fragmentations of more than 5,000 pieces. The Inter-Agency Space Debris Coordination Committee (IADC) was formally established in 1993 (1) to promote the exchange of information on space debris research activities between member space agencies, (2) to facilitate opportunities for cooperation in space debris research, (3) to review the progress of ongoing cooperative activities, and (4) to identify debris mitigation options. They issued the Space Debris Mitigation Guideline and it was endorsed at the UN Committee on Peaceful Uses of Outer Space in June 2007 at its 62nd session. And the UN General Assembly endorsed the UN Space Debris Mitigation Guidelines in 2009. On the other hand, we are facing new threats such as a large number of nano satellites' launch after year of 2010. For example, more than 300 nano satellites have been launched into LEO by 2014. When IADC had discussed the initial Space Debris Mitigation Guidelines, they could not foresee such situations changes in LEO orbit. They could possibly pose significant threats to primary satellites because of the lack of propellant systems for maneuvering. Space development and use must be constrained, unless space debris and space objects are well managed, except for limited specific missions that require the most advanced technology or specific scientific research. Regarding small satellites, while some with specific missions may be expected to remain in their orbits for a long time, others launched for educational and capacity-building purposes may not need to be in their orbits for an extended period. For the latter, the duration to remain in the orbit or their lifetime should be shortened and limited. Furthermore we are facing another serious situation so called Mega Constellations. More than 10,000 satellites program have been proposed in the world but there are no regulations/guidelines. I would like to propose in this paper that UN COPUOS should discuss about those issues as soon as possible because revision of UN Space Debris Mitigation Guidelines could not be complied with such situations.