FORUM: THE ENVIRONMENTAL COMMISSION

QUESTION OF: Measures to Reduce Space Debris and Environmental Risks from Expanding Satellite Constellations in Low Earth Orbit

MAIN SUBMITTER: China

CO-SUBMITTERS: Canada, France, Japan, Croatia, Algeria, Australia, Germany, Chile, Colombia, Poland

THE ENVIRONMENTAL COMMISION

Having heard an estimate of 68.450 objects larger than 10 cm, 1.5 million objects around 1- 10 cm, 230 million objects less than 1cm, exceeding 17000 metric tons of objects are in Earth's orbit, recorded in February 2026,

Concerned that space debris leads to destruction of the ozone layer, part of Earth's atmosphere that contains a large amount of ozone gas, which protects the Earth from ultraviolet radiation,

Keeping in mind the importance of the ozone layer, which protects people, animals, and plants from excessive ultraviolet exposure, causes damage to skin, eyes, and a risk of skin cancer,

Alarmed by the dramatic accumulation of debris in Low Earth Orbit (LEO), which threatens the safety of future space objects and the fragmentation into large chunks,

Emphasizing the importance of international cooperation, communication, and stricter rules to secure a safe mission without stacking debris,

1. <u>Calls upon</u> member states to strengthen and clarify international regulations regarding space debris and satellites to ensure nations take responsibility for disposing of their non-operational space objects in a safe and timely manner, such as, but not limited to:
    a) Establishing new international regulations to ensure that all satellite operators properly manage and dispose of non-operational satellites by:
        i. Establishing a 5-year disposal rule, which requires companies to remove their non-operational space objects within 5 years after their mission ends, where safely possible,
        ii. Requiring satellite operators to undergo a pre-launch risk assessment based on orbital congestion, existing space debris density, and potential collision risks before receiving launch approval,
        iii. Requiring companies to submit mandatory reports containing launch dates and disposal dates of each space object they send into orbit,
    b) Introducing financial penalties and administrative sanctions for space operators that fail to follow the space object disposal regulations by:

i. Calling for financial penalties for failure to dispose of their space objects within the required 5-year period, with penalties increasing for each repeated violation,
ii. Requesting a temporary suspension of launch permissions for companies that have failed to meet the regulation a certain number of times,

c) Recommends providing international guidelines to help space operators follow the implemented disposal rules by:
i. Providing precise instructions on satellite disposal methods, including removal via additional spacecraft, or controlled deorbiting,
ii. Offering training, guidance, and access to necessary materials for countries with limited technology, helping to develop a successful disposal plan for non-operational space objects;

2. Encourages all member states to raise public awareness about the danger of space debris and let citizens learn the great impact of space systems that this issue is leading to, such as, but not limited to:
a) Posting posters around the world on online blogs or social media such as Instagram and TikTok to make citizens consider the impact of debris from satellites through ways such as, but not limited to:
i. utilizing media platforms,
ii. cooperation with local governments,
iii. educational campaigns and different programs,
b) Establishing educational programs and workshops in high schools and universities to provide further awareness of the risk from the accumulation of satellites and debris to the youth generation:
i. Organizing interactive workshops regarding satellite debris and its environmental risk by using computer simulation to demonstrate the risk of satellite collisions and Kessler syndrome,
ii. Allowing students to use publicly available satellite tracking data to better understand how crowded Earth's orbit is and identify possible collision risks,
iii. Establishing international student research competitions and providing certificates, awards, and research grants to encourage continued participation,
c) Organizing public forums and citizen discussions to raise awareness about the environmental risks of space debris and encourage citizens to participate in discussions regarding possible solutions to this issue;

3. Requests member states to strengthen satellite monitoring systems to assess collision risks, orbital congestion, and environmental impacts, while promoting a balance between technological development and environmental sustainability:
a) Holding periodic conferences by inviting member states in order to collaborate on the data and devise the sustainable accumulation of satellites:
i. Reporting the numerical data of defunct satellites,
ii. Reporting the numerical data of overall launched satellites,

b) Constructing and deploying a ground-based phased array radar technology to model potential trajectories of the debris and predict space debris that is potentially colliding with rockets:
    i. Obligating construction of a ground-based phased array radar-station in order to develop a tracking system of defunct satellites and debris,
    ii. Driving annual functional inspection of the ground-based phased array radar-station,
c) Establishing an international monitoring system in cooperation with relevant space agencies to collect and share data on toxic emissions, atmospheric pollution, and changes in ozone concentration caused by satellite launches and re-entry,
d) Sharing satellite debris data through international organizations such as United Nations Committee on the Peaceful Uses of Outer Space (UN COPUOS) and United Nations Office for Outer Space Affairs (UNOOSA);

4. Calls upon member states, international organizations, and private space industries to provide financial and technical assistance for the development and implementation of space debris removal and disposal technologies in LEO, such as, but not limited to:
    a) Encouraging financial support from developed countries and international organizations to help countries with limited financial resources develop space debris management technologies by:
        i. Voluntary international funding programs to support research and development of technologies such as robotic arms, debris capture nets, and satellite deorbiting systems,
        ii. Developed countries and private space companies to contribute financial resources, technological equipment, and research materials to countries that lack advanced space technologies,
    b) Supporting international research institutions and private companies regarding space technology in order to improve the removal of space debris:
        i. NASA,
        ii. Space X;

5. Urges the development and implementation of various technologies to remove or reduce space debris in Low LEO, such as, but not limited to:
    a) Encouraging space industries to develop and install debris removal technologies on spacecraft to capture and safely dispose of non-operational space objects by:
        i. Equipping spacecraft with robotic arms to capture large, trackable space debris and guide it toward Earth's atmosphere for safe re-entry,
        ii. Developing nets attached to debris removal spacecraft to capture selected pieces of space debris and guide them toward atmospheric re-entry while minimizing the risk of creating additional debris,
    b) Encouraging space industry companies to develop a disposal plan before launching satellites into space by:

i. Installing propulsion systems or other deorbiting technologies to move satellites into lower orbits after completing their missions, allowing them to eventually re-enter Earth's atmosphere,
ii. Sending additional spacecraft to capture and guide inactive satellites toward controlled atmospheric re-entry, particularly when the satellites cannot safely deorbit themselves,

c) Recommending the establishment of an international space recycling program to promote the recovery and reuse of components from non-operational space objects, where technically and economically feasible, by:
    i. Encouraging space operators to collect reusable components from retired space objects during authorized retrieval or servicing missions, with permission from the responsible states,
    ii. Supporting further research into technologies that allow recovered components to be repaired and reused for future space missions, reducing the need to manufacture and launch new components,
d) Encouraging space manufacturers to design satellites and spacecraft with recyclable materials and replaceable components to promote resource recovery and reduce future space debris by:
    i. Recommending the use of recyclable materials, such as aluminum, copper, and titanium, in components intended for recovery and reuse, while considering spacecraft safety and atmospheric re-entry requirements,
    ii. Encouraging manufacturers to design space objects with detachable and replaceable components to allow easier repairs, replacement of damaged parts, and recovery of reusable materials without creating additional debris;

6. Encourages member states to establish an international framework to minimize the environmental impact of space debris during atmospheric re-entry, particularly regarding ozone layer depletion and the release of toxic substances, through measures such as but not limited to:
    a) Promoting the research and development of environmentally friendly spacecraft materials that release fewer harmful chemical substances during atmospheric re-entry:
        i. Encouraging manufacturers to replace hazardous materials with environmentally friendly alternatives,
        ii. Supporting scientific research into materials that produce fewer harmful substances when exposed to the extreme conditions of atmospheric re-entry,
    b) Requiring space agencies and private space companies to conduct environmental impact assessments before launching spacecraft and establishing environmentally responsible disposal plans to minimize the release of harmful chemical substances and reduce potential damage to Earth's atmosphere during atmospheric re-entry through ways, but not limited to:

i. Evaluating the potential environmental risks caused by the materials used in spacecraft, particularly those that may release harmful substances during atmospheric re-entry,
ii. Requiring companies to submit detailed disposal plans that explain how non-operational spacecraft will be removed from orbit while minimizing harmful chemical emissions,
iii. Encouraging regular reviews of disposal plans to ensure that they follow international environmental standards and incorporate newly developed environmentally friendly technologies,

c) Encouraging international cooperation among governments, private space companies, and scientific institutions to develop reusable spacecraft components and reduce the amount of space debris entering Earth's atmosphere;

7. Calls for the establishment of coordinated emergency response plans to address unexpected space debris incidents and cascading collision risks in LEO, such as but not limited to:
    a) Strengthening emergency communication between satellite operators and relevant space agencies by:
        i. Requiring satellite operators to promptly report confirmed collisions, satellite breakups, or other debris-generating incidents to relevant national authorities and international tracking organizations,
        ii. Encouraging the establishment of an international warning system to notify satellite operators of newly detected debris, affected orbital regions, and potential collision risks,
    b) Developing coordinated emergency response procedures to prevent further collisions and minimize additional debris generation by:
        i. Encouraging satellite operators to perform collision avoidance maneuvers when technically feasible and when collision risks exceed established safety thresholds,
        ii. Coordinating with other satellite operators to exchange updated orbital data and plan safe collision avoidance maneuvers in debris-affected regions,
        iii. Recommending temporary restrictions on new satellite launches into heavily debris-affected orbital regions when collision risks exceed acceptable safety levels.