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TRAFFIC AHEAD: MEASURES TO MITIGATE SMALLSAT CONGESTION IN LOW EARTH ORBIT

Abstract

On the morning of February 15, 2017, an Indian Space Research Organisation Polar Satellite Launch Vehicle successfully launched 104 individual satellites, all but one of which were smaller than 10 kg, including 96 cubesats under 5 kg each for two US-based commercial remote sensing and earth imaging companies. The feat nearly tripled the record for the most objects placed into orbit in a single launch, which, while an impressive feat of engineering, raises a number of concerns about the future of small satellite launch, space situational awareness and orbital congestion. The process of space object registration is clearly established for states parties to the international treaties, though those processes are not always followed. For nations not parties to the treaties, there are few measures in place to prevent irresponsible actions that contribute to increasing congestion in low earth orbit and a lack of ability to accurately track small space objects. To mitigate risk of in-space accidents and protect national interests, effective international policies should be created and consequences established for nations and launchers who do not adhere to responsible practices. These policies should be proactive, rather than reactive to incidents as they happen, in order to support private growth and prevent overly aggressive reactionary policy measures that could adversely impact the fledgeling industry, while seeking long-term space sustainability.

Despite some risk, small satellites are impressive pieces of technology that contribute to scientific advancement, commercial activity, national security and quality of human life on earth. Their development should be encouraged, but done in a manner that protects existing interests, rather than eschewing them. Their advancement has been marked by strong investment from the private industry and national space organizations alike and they function as a democratizer in space, enabling access for entities that would not otherwise have a presence in low earth orbit. To effectively continue their technological maturation, usefulness, and responsible utilization, national and international policies must be adapted to better include their unique capabilities and qualities compared to traditional satellites. Safeguards must be employed to prevent inhabitable LEO conditions and protect future access to space, particularly for inexperienced actors.