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ORBITAL FOOTPRINTING FOR AWARENESS OF SPACE TRAFFIC MANAGEMENT

Abstract

On the 11th February 2009, two satellites, one of which was operational, collided in orbit creating a thousand piece debris cloud. Although this is the first time this has ever happened, it highlights the urgent need for the introduction of a space traffic management system. The idea behind this paper is that a personalized 'Orbital Footprint' can be established for each spacecraft which can in turn be compared directly with that of any other spacecraft. It would be based on an adherence to a 'Space Traffic Management' system (STM) suggested by a team of students at the International Space University which pays particular attention to issues such as orbital launcher type, slot allocation, fuel management procedures and disposal at end of life. An 'orbital footprint' would be a measure of the impact a spacecraft has on its orbital environment from launch to end of life. This system would serve to illustrate to all satellite stakeholders how a particular system compares 'ecologically' to others and would inform prospective customers as to the orbital environmental impact of the product they will buy or whose services they will engage. This is a continuation an idea proposed at IAC in 2008 which introduced the idea of Orbital Footprinting. It builds on the original paper in terms of practical implementation and goes on to examine the economic, legal and policy implications. The paper will discuss how this concept could be employed for use in a STM system. This scheme is a tenuous first step in a system which aims to educate the consumer as to the potential for unmanaged activity in orbit to become hazardous to functioning spacecraft and the Earth and Orbital environments. Space traffic management not only provides for the security of space assets or secures access to space products and services but could avert direct damages of space activity on humans. The objective of the paper is to bring to the consciousness of the space community and, by extension, the world at large, the impact of unmanaged space activity on space environment hence the impetus for creating and strengthening proposed rules of the road in space.