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ESSENTIAL AND CRITICAL ELEMENTS OF AN EFFECTIVE SPACE TRAFFIC MANAGEMENT SYSTEM

Abstract

In the last decades, Outer Space activities have been developed in various aspects. Nowadays lots of actors are playing an important role in exploring outer space and even exploiting its resources. As a result of this fact, the number of space objects and space vehicles has increased and the possibility of outer space incidents is increasing as well which can lead to extensive damage to space and even the earth's environment. On the other hand, the need to respect Sustainable Development of Space Activities, which can be seen as receiving some impression from Sustainable Development, has been actively and repeatedly debated over the past few years. Clearly one of the most important factors in preventing space incidents and achieving Sustainability in space activities is through the establishment of an effective Space Traffic Management System that is able to predict and solve potential problems that may arise from the rapid development of space activities.

Due to the fact that there is no effective Space Traffic Management System yet, the writer will consider various elements that are important to establish an effective Space Traffic Management System. Collecting reliable Data about the place and the situation of Space Objects and Space Debris which is known as Space Situational Awareness (SSA) Data and Processing these collected data by using Algorithms that can predict the Orbital path of and Space Object are the first two Essential elements. but these elements need a third complementary element that has a legal nature and is related to the insufficiency of current domestic and international space regulations in order to guarantee the collection and sharing. So the third critical element is the Law. All these three elements have their own challenges to be complete which need further attention.