

IAF SPACE POWER SYMPOSIUM (C3)
Solar Power Satellite (1)

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DISPOSAL METHOD FOR SPACE SOLAR POWER SATELLITE

Abstract

At present, satellites deployed in low earth orbits(altitude : 100 to 2,000 km) are removed after their missions are completed by means of lowering their altitudes and finally incinerating them by friction heat with the atmosphere(de-orbit). For uncontrollable satellites, they will be forcibly de-orbited by using space debris systems such as space debris removal spacecrafts. Meanwhile, satellites deployed in geostationary orbit (altitude 35,786 km) cannot be removed in the same way as above. Therefore, at present, they are moved to the graveyard orbit by increasing their altitudes by 200-300 km. However, this approach is not applicable for giga watt-class space solar power satellites whose dimensions are several kilometers because it is highly possible for space solar power satellites to collide with other satellites in the graveyard orbit and cause Domino-like collisions(Kessler Syndrome). For this reason, the disposal of space solar power satellites could be the biggest dilemma even though they are developed in order to provide the green energy for humankind on the Earth. For a simple disposal method, satellites can be sent into deep space recognizing that it is a littering in the universe and they will remain as threats to space passage in the long run. For a better way, space solar power satellites could be dumped in Sun-Earth Lagrangian points(L4 or L5). This method could be the best possible solution even though it does not completely remove space solar power satellites in space. This study is about a new method for completely removing mega-structures such as Space Solar Power Satellite and O'Neil Cylinder. As the method is currently in the process of patent application, the comprehensive steps will be described in detail after the patent application is completed.