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Author: Mr. Yuji Takaki
Mitsubishi Heavy Industries, Ltd., Japan, yuji.takaki.pt@ds.mhi.com

Mr. Toyonori Kobayakawa
Mitsubishi Heavy Industries, Ltd., Japan, toyonori_kobayakawa@mhi.co.jp

FEASIBILITY STUDY TO AVOID LAUNCH COLLISION WITH ORBITAL OBJECTS BY MODIFYING FLIGHT TRAJECTORY OF LAUNCH VEHICLE

Abstract

Recently, the number of orbital objects such as space debris and in-operation satellites has been increasing. It is anticipated that collisions between debris will generate more debris in the future. Moreover, the number of operated satellites will grow by the progress of the plan for mega-constellation satellites. Increasing space objects may threat the reliability and opportunity of launch, and if collision occurs, additional debris will be generated in orbit. Therefore, considering the mission whose launch window is short, future launch vehicles are preferable to have the capability to avoid space objects not only by changing the launch epoch, but also modifying their flight trajectories. In this paper, MHI evaluates the future risks of launch collision with orbital objects. Furthermore, it is shown that to modify flight trajectory of launch vehicle is effective to decrease risks of launch collision. It enables us to achieve high reliability and many opportunities of launch.