

SPACE PROPULSION SYMPOSIUM (C4)
Missions Enabled by new Propulsion Technology and Systems (6)

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TECHNICAL FINDINGS ASSOCIATED WITH DYNAMIC CHARACTERISTICS OF HTV
PROPULSION SYSTEM

Abstract

The H-II Transfer Vehicle (HTV) is JAXA's unmanned cargo transfer spacecraft that delivers supplies to the International Space Station (ISS). HTV is a large spacecraft which measures 10 meters in length and 4.4 meters in maximum diameter. One of the common challenges in operating a spacecraft propulsion system is to manage its dynamic characteristics, such as the water hammer at priming, propellant GHe saturation effects and thruster cross-coupling for example. In smaller systems, these dynamic characteristics are maintained within acceptable limits by careful selection of the propulsion elements. However, also careful operating management is necessary in larger propulsion systems, such as the one used in HTV. This paper presents an overview of the HTV propulsion system, its operational characteristics and the work being done to implement design and procedural modifications to effectively manage dynamic characteristics effects during various mission phases in orbit.