Paper ID: 11625
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SPACE OPERATIONS SYMPOSIUM (B6)
Human Spaceflight Operations Concepts (1)

Author: Mr. Koji Yamanaka
Japan Aerospace Exploration Agency (JAXA), Japan, yamanaka.koji@jaxa.jp

Mr. Kota Tanabe
Japan Aerospace Exploration Agency (JAXA), Japan, tanabe.kota@jaxa.jp
Mr. Takashi Uchiyama
Japan Aerospace Exploration Agency (JAXA), Japan, uchiyama.takashi@jaxa.jp
Mr. Tsutomu Fukatsu
Japan Aerospace Exploration Agency (JAXA), Japan, fukatsu.tsutomu@jaxa.jp
Mr. Hiroshi Sasaki
Japan Aerospace Exploration Agency (JAXA), Japan, sasaki.hiroshi@jaxa.jp

HTV FLIGHT OPERATION RESULTS

Abstract

The H-II Transfer Vehicle (HTV) "KOUNOTORI" is a Japanese unmanned space vehicle developed by the Japan Aerospace Exploration Agency (JAXA) for International Space Station (ISS) re-supply and waste cargo disposal. The HTV-1 was launched on September 10, 2009 (GMT) by H-IIB Launch Vehicle from the Tanegashima Space Center, captured by the ISS robotic arm (SSRMS) on September 17. After completion of all plannedr mission HTV-1 departed from the ISS on October 31, then successfully re-entered the atmosphere on November 2. HTV-2 was launched on January 22, 2011, and the rendezvous operation was successfully completed on January 27, 2011. The ISS and HTV use capture and berthing technique instead of docking. Capture can maintain distance (approximately 10m for ISS-HTV case) and zero relative velocity, also it allows large cargo transfer. The difficult part of this new capture and berthing technique is not only required high control accuracy but also that all participants, both the capturing side and the captured side, both onboard and ground personnel, need to work in synchronized harmony, specifically the ISS, HTV, ISS Crew, MCC-H and HTVOCS must work cooperatively and organically across the pacific ocean and space. To overcome such difficulties, NASA and JAXA have developed a joint closed-loop simulation environment connecting existing high-fidelity simulators with each others over seas using latest simulation technology. This paper shows flight operation results of HTV, including some comparisons between HTV-1 and HTV-2, and introduction of simulation capability which enabled successful rendezvous and capture/departure operation of HTV1 and 2.