

Development of MCE (Multi-mission Consolidated Equipment)

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1.Overview

MCE (Multi-mission Consolidated Equipment) has following 5 mission equipments. MCE is attached to Kibo exposed facility, then perform each experiments.

IMAP ;Ionosphere, Mesosphere, upper Atmosphere and Plasmasphere mapping

GLIMS ; Global Lightning and Sprite Measurement Mission

SIMPLE ;Space Inflatable Membranes Pioneering Long-term Experiments

REX-J ;Robot Experiment on Japanese experiment module

HDTV-EF ;

IMAP, GLIMS, HDTV-EF are installed in MCE base plate (earth direction), because they need earth direction field of view. SIMPLE is installed in forefront of MCE, because SIMPLE has extendable must, and this must will extend after MCE is attached to Kibo exposed facility. REX-J is installed in second floor of MCE.

MCE will be mounted to Konotori, which is unmanned transfer vehicle to International Space Station. Konotori will be launched by H2B rocket. MCE will be attached to Kibo exposed facility by Kibo robot arm. Then, MCE will be received electrical power and communication from Kibo exposed facility. Experiments will be performed more than 2 years. After experiments, MCE will be mounted to Konotori, then jettisoned to earth atmosphere.

2.Development of MCE

Development of MCE started in Nov. 2008. PDR (Preliminary Design Review) was performed in Aug. 2009. CDR (Critical Design Review) was performed by each subsystem level from Dec. 2009. 5 mission equipments were handovered to MCE system from Jul. 2010 to Nov. 2010. MCE system level test was performed from Dec. 2010.

(1)Performance test

Performance of MCE was verified.

(2)Thermal vacuum test

Performance of MCE under space environment (high/low temperature and vacuum) was verified.

(3)Modal survey test

Accerlations of MCE were measured to verify MCE structural characteristics.

(4)Acoustic test

Acoustic environment during launch was loaded to MCE, to verify MCE resistance characteristic.

(5)Crew interface test

Operability of MCE by EVA (Extra Vehicle Activity) was verified.

(6)Electro-magnetic compatibility test

To verify that electromagnetic wave from MCE will not affect to circumstance. To verify that MCE perform normally under electromagnetic environment in International Space Station.

(7)Ground operation system interface test

To verify that communication (command and telemetry) between ground operation system and MCE was performed normally.

3.Future plan

MCE will be launched in 2012. MCE will be transported to Tanegashima space center. Then, MCE will be handovered to

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Konotori.

Maintenance of ground operation system, development of on-orbit operation procedures, training of ground operators were performing to be ready for MCE on-orbit operations.

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