SPACE OPERATIONS SYMPOSIUM (B6)
Human Spaceflight Operations Concepts (1)

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HIGHLIGHTS IN COLUMBUS OPERATIONS AND PREPARATION FOR ASSEMBLY COMPLETE OPERATIONS PHASE

Abstract

Since the activation of Columbus on 12 February 2008 two years of busy and partly challenging operation have been performed by the Columbus FCT. With a total of 8 experiment racks, 1 external payload and several stand-alone experiments situated in Columbus the Columbus Flight Control Team is very busy to prepare and execute operations in the European module, taking into account the larger workforce onboard ISS since the permanent 6 person crew has been established in May 2009.

Since September 2009 the Columbus onboard computers are again up to date after the successful Cycle 12 Transition. This includes also update to the PWS (Personal Workstation) used by the onboard crew to monitor and command the Columbus module, if necessary. Additionally degraded hardware had to be exchanged, e.g. the CMU 1 as well as maintenance like smoke detector cleaning had to be performed.

The major challenges of the third year of Columbus operations was the maintenance of the WOOV8 valve of the Thermal Control System by a combined crew/ground activity including a necessary rack tilting and the recovery of a Columbus Onboard DMS problem with some ripple effects on operations.

The preparation work concentrated on new ESA experiments like the 5th ESA rack called MARES delivered with Shuttle flight 19A (STS-131) and the Vessel-ID payload delivered in spring 2010.The MARES rack will be installed in F3 location in Columbus during 19A flight and a first short commission will be done in ULF4 stage. The major commissioning is foreseen for Increment 2526 starting in October 2010, which needs to be prepared by the responsible USOC – CADMOS – together with the Col-OCs.

After the retirement of the Shuttle in autumn 2010 the possibilities to transport defect parts to earth and spare parts to orbit will vanish or reduced, respectively. Hence the maintenance approach of Columbus after Assembly Complete of the ISS in 2010 has to be adapted to allow smooth operations and to ensure full support of the Columbus system for payload operations to fulfil the science objectives of the European module.

The paper will give an overview of the achievements and highlights of the last year and concentrate further on the operational goals and constraints of the next years as well as a forecast on the planned ISS operations until 2020.