Paper ID: 81361
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27th IAA SYMPOSIUM ON HUMAN EXPLORATION OF THE SOLAR SYSTEM (A5)
Human Exploration of the Moon and Cislunar Space (1)

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EVOLUTION FROM COL-CC TO HECC – THE NEXT STEP IN HUMAN SPACEFLIGHT OPERATIONS

Abstract

The Columbus Control Center (COL-CC) gained more than 15 years of experience operating European contributions to the International Space Station. Besides the daily operation of the Columbus module, COL-CC has the main integration function for ESA's activities on the International Space Station. Already prior the start of the Columbus mission the German Space Operations Center (GSOC), where COL-CC is a part of, gained experience in human space flight for 40 years by supporting, e.g. the Space Shuttle STS-61-A and STS-55 mission, also known as D-1 and D-2.

The next chapter of human space flight will not only bring human beings back to the lunar surface but also increase the experience in human missions in a deep space environment for an eventual mission to Mars. To succeed in this endeavor, a new space station around the moon will be built as a joint effort by NASA, ESA, CSA, JAXA and UAE's Mohammed bin Rashid Space Centre (MBRSC). The Lunar Gateway will operate in a cis-lunar orbit and compared to ISS it is designed with a higher grade of automatism and self-reliance.

GSOC will take a leading role in the operation of the ESA provided Gateway modules and payloads while carrying on its responsibilities for ISS operations. Therefore, COL-CC will evolve to the Human Exploration Control Center (HECC) Munich. Besides routine operation of the two ESA provided modules International Habitat (I-Hab) and the ESPRIT Refueling Module (ERM) it will also be responsible for payloads and engineering support for the HALO Lunar Communication System (HLCS) – an ESA provided antenna for Moon to Gateway communications operated by NASA. The capabilities of the already existing ground network for ISS operation will be increased and HECC Munich will become the European network hub interface towards NASA.

This paper will mainly focus on the envisaged evolution from COL-CC to HECC Munich. It will describe the new tasks required for the operation of European payloads and modules and the corresponding engineering tasks. The paper will also elaborate how the operations team contribute to the hardware and module development and on the operational setup with the gained ISS experience.