HUMAN SPACEFLIGHT SYMPOSIUM (B3)
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ORION EUROPEAN SERVICE MODULE DEVELOPMENT STATUS AND NASA/ESA COOPERATION

Abstract

Following the very successful series of five Automated Transfer Vehicles (ATV) missions to the International Space Station (ISS) which were completed in 2015, ESA and NASA jointly decided to partially offset the European obligations deriving from the extension of the ISS Programme until end 2020 with different means. The selected barter option was a new development: the provision by ESA of the European Service Module (ESM) for NASA's new Orion human exploration spacecraft as part of the Exploration Mission 1 (EM1). This development and production was entrusted to the prime contractor of the ATV, Airbus in Bremen, Germany.

This paper gives a short overview of the system and subsystem configuration of the Orion European Service Module (ESM) for the EM1 mission and an outline of the development approach, e.g. model philosophy, implemented by ESA and NASA in coordination with their Industrial prime contractors, Airbus and Lockheed Martin.

The paper will also address cooperation methods and applied processes and an outlook of potential Service Module evolutions.

The current agreement foresees the development and production by Europe of two flight models. The first ESM module is in the final stages of assembly in Europe and is planned to be delivered to NASA before the end of 2017. It will be used for the uncrewed flight test of Orion called EM1 planned for late 2018. The second ESM module will be delivered 2019 for the first crewed flight of Orion as early as 2021. This will be NASA's first mission with crew in a series of missions in the proving ground, an area of space around the moon where crew can build and test systems needed to prepare for the challenge of missions to Mars. In the broader context of human exploration of deep space, the Orion ESM makes ESA an early key player.