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ORION EUROPEAN SERVICE MODULE ON THE WAY TO FIRST FLIGHT MODEL DELIVERY

Abstract

The ORION spacecraft is a multi-purpose crew vehicle designed to support missions beyond low earth orbit. ORION will be launched by the Space Launch System (SLS).

The ORION vehicle includes the following elements:

- Crew Module (CM)
- Crew Module Adapter (CMA)
- European Service Module (ESM)
- Launch Abort System (LAS) - prior to jettison
- Spacecraft Adapter (SA)
- Spacecraft Adapter Jettisoned fairings (SAJ)

NASA, ESA, European and US Industry have teamed to develop the ORION spacecraft. ESA is responsible for the European Service Module and awarded a contract to Airbus Defence Space for its development and production of the first flight unit. The European Service Module provides translational thrust and 3 axis attitude control for the spacecraft, stores life support consumables for the crew module (oxygen, nitrogen and water), and provides thermal control and power.

Major milestones were achieved in 2016 by the Orion ESM program as the ESM Critical Design Review (CDR), Hydraulic Model tests of the Propulsion Subsystem, dynamic test campaign with the Structural Test Article (E-STA) and beginning of the electrical tests with the ESM-QF test model.

This paper presents the status of the Orion ESM program with a description of the final design and the design verification as considered for ESM following the Critical Design Review (CDR) process and with a special focus on the integration and test activities of the first flight model ESM FM1. Also an outlook is given on the upcoming steps up to FM1 delivery as well as actual status of FM2 activities.