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HALO, THE FIRST HABITABLE ELEMENT FOR CISLUNAR STATION AND MISSION: ITALIAN  
ROLE AND CHALLENGES**Abstract**

HALO is the first pressurized habitable element for the astronauts crew visiting the Gateway station, orbiting around the Moon and the first outpost for long-term human return to the lunar surface, as well as a staging point for deep space exploration. HALO primary purpose is to provide basic life support needs for the visiting astronauts after they arrive in the Orion and prepare for their trip to the lunar surface. It will provide command, control, and data handling capabilities, energy storage and power distribution, thermal control, communications and tracking capabilities, as well as environmental control and life support systems to augment the Orion spacecraft and support crew members. It also will have three docking ports for visiting vehicles and for science and stowage elements as well as for future modules, like I-HAB (for which TAS-I is ESA prime contractor). TAS-I as Northrop Grumman contractor is developing the structure and the hatch as well as part of environmental control system. The long-lasting partnership with Northrop Grumman is enabling the furniture of the HALO module to NASA respecting a very ambitious schedule, that no one else could have respected. TAS-I with Northrop Grumman already developed 18 Cygnus PCM logistics elements for the International Space Station. This success and the unique capabilities in pressurized modules development allowed TAS-I to be involved in this first cislunar element. HALO together with the Power and Propulsion Element is for the Gateway the critical initial elements required to support the landing on the Moon. The PPE and HALO are targeted to launch together in 2024 on a Falcon Heavy rocket from Launch Complex 39A at Kennedy. This paper will provide a description of Thales Alenia Space role in the development of the initial lunar infrastructure and the challenges encountered during the development of this element.