IAF SPACE EXPLORATION SYMPOSIUM (A3)
Moon Exploration – Part 2 (2B)

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ARGONAUT LDE – EUROPEAN ACCESS TO THE MOON

Abstract

The Argonaut programme, previously known as EL3 and procured by the European Space Agency (ESA), represents European ambitions to land on the Moon and take part in and benefit from the emerging lunar economy. Argonaut will provide a fully European autonomous capability of safe and precise landing of 1-tonne class payloads, relying on the Ariane 64 launcher. This programme has been devised from the start as a recurring series of missions that can support a variety of payloads such as scientific, logistic, cargo, and infrastructure. Argonaut has been driven by the following high-level strategic objectives:

- Provide autonomous European access to the Moon
- Support ESA science strategy for the Moon
- Support ESA strategy for lunar infrastructure
- Provide support to Artemis

This paper will provide an updated status on the Argonaut development, specifically regarding the Lunar Descent Element (LDE), which is the recurring generic element of Argonaut. The LDE is responsible for the safety of the Passenger (combined payloads and support elements) including a safe landing, after which the Passenger will take over operations. The LDE provides the Passenger with a thermally benign environment during the transfer and in lunar orbit, as well as providing data relay services for Passenger payloads and equipment. The LDE also provides a limited power supply service to the Passenger. After landing, the LDE is responsible for its own passivation, including propellant passivation, to ensure that the LDE and Passenger are safe to approach by future astronauts. Once the LDE has been passivated, the LDE structure then passively supports the Passenger in its multi-year mission.

Although the LDE itself will not survive the lunar night, it provides sufficient capacity in terms of mass and volume to enable the Passenger to include its own lunar night survival capability, including the possibility of radio-isotope power sources (RPS) in the Passenger. The LDE design must therefore meet stringent reliability constraints, in order to prevent the return of any nuclear material to Earth.