

IAF SPACE EXPLORATION SYMPOSIUM (A3)
Moon Exploration – Part 1 (2A)

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EUROPEAN ACCESS TO THE LUNAR SURFACE: EL3

Abstract

Global access the Moon surface is one of the key capabilities/services that the European Space Agency intends to master by the second half of this decade as part of an overall effort to extend its LEO (Low Earth Orbit) capabilities toward Mars Exploration but also in answer to the unique opportunities linked to the foreseen lunar economic development. This ambition will in particular be served by the European Large Logistic Lander (EL3) program whose definition and development are driven by the following high-level strategic orientations:

- European Autonomy for Moon exploration
- Strong scientific content, aligned with the ESA science strategy for the moon and space resources strategy
- Coherence with the overall International Moon Exploration

EL3 aims at an initial payload landing capability ranging from 1500 to 1700 kg anywhere on the Moon, relying on the Ariane 64 as launcher. The operational sustainability will be achieved by a recurring program and balance between science and cargo/logistics payloads.

The EL3 phase A/B1 initiated in October 2020 and to be completed by July 2022 addresses the generic aspect of the program. In parallel, two specific mission scenario, a logistic cargo and a scientific mission at the South Pole (aka Polar Explorer), are contending for the first seat. Both scenario are being studied in order to achieve a sufficient level of definition. By end of 2022 , the ESA's council of Ministers will decide on the first EL3 mission and hence the start of the overall program.

The paper will provide a status of the industrial studies as well as a detailed presentation of the Lander Descent Element (ie the recurring part of the program), its technology challenges and baseline, as well as the overall generic concept of operations. Key aspects such as propulsion, Guidance, Navigation and Control, lunar night survival will be detailed in particular. Possible future enhancement paths will also be addressed.