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SPACE EXPLORATION SYMPOSIUM (A3)
Space Exploration Overview (1)

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IRENA, DEMONSTRATING ADVANCED RE-ENTRY TECHNOLOGIES FOR PLANETARY EXPLORATION MISSIONS

Abstract

IRENA (for International Re-Entry demoNstrator Action) is an action performed by an international consortium aiming at defining two technology demonstrator projects to validate advanced entry/re-entry technologies. In addition, IRENA shall create the ground for the implementation of these two projects in an international framework, such as promotion to ISECG, or next step in Horizon 2020 program. This action has received funding from the European Union's Horizon 2020 research and innovation programme, under the strategic objective COMPET-2014. It has started in January 2015, and is planned to finish in April 2016.

To achieve these objectives, IRENA relies on an international and complementary team: four major European and international space agencies (CNES, DLR, NASA, JAXA), the two European industry leaders in entry/re-entry and space exploration (Airbus Space and Defence, Thales Alenia Space) and a research institute expert in dissemination and exploitation (Demokritos).To maximise the chances of the projected demonstrators materialising in the future, the international dimension is essential, which explains why two key non-European actors (NASA and JAXA) have been invited to join a team based otherwise on the most prominent European actors in the field.

Advances in re-entry systems and related technologies will enhance of scientific missions in the solar system and prepare future human exploration by developing the following capacities:

- Aerocapture on Mars or other atmospheric bodies,
- Return of non-terrestrial samples, which need high velocity re-entry capsules,
- Precision landing, in particular on Mars,
- High mass landing, in particular in view of future Martian infrastructure needed for human sustenance.

This paper will first give an overview of IRENA's organisation and work plan, which consists in 3 steps:

- Demonstration needs for entry/re-entry between Europe, the USA and Japan
- Demonstrator concepts – Technical appraisal and cost,
- Demonstrator projects – implementation in terms of governance, funding, international cooperation scheme, and selection the 2 most promising projects.

We will then elaborate in details the results obtained at the time of the conference, when the conclusions of the first step shall be available. The Space Exploration Symposium of the IAC represents a great opportunity for the IRENA to receive valuable feedback from the community before focusing on the most promising re-entry demonstrators and eventually selecting two of them.