PRESS INFORMATION

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Planetary re-entry initiative from advanced structure specialist

Aero Sekur, the specialist manufacturer of safety systems and advanced flexible structures for the aerospace and defence markets, is developing a SPacecrew EMergency module (SPEM). The module, which has been designed for use as an escape mechanism by orbiting astronauts, uses latest heat shield technology capable of protecting an astronaut during emergency re-entry phase. Applications include returning samples to earth and use as an escape mechanism by orbiting astronauts i.e. a space lifeboat.

The SPEM has a scheduled operation date of 2015. The technology for the flexible thermal protection system was developed as part of an ESA contract. Development of the SPEM design was subsequently initiated in 2005 and extensive ground qualification was carried out in this year. In 2009, Aero Sekur's SPEM successfully passed a major qualification test to simulate atmospheric re-entry. The 2009 qualification test was a significant milestone in the product's development cycle and interest in the module has been expressed by major players in the space community.

The breakthrough concept from Aero Sekur was made following the Space Shuttle Colombia disaster. Prompted by the Colombia incident in 2003, the company deployed its in-house R&D resource with expertise in inflatable, disposable protection technologies to produce the new generation space protection/safety system.

Aero Sekur reports that the SPEM module is designed to resolve, at reasonable cost, the problem of guaranteeing crew survival in emergency and re-entry conditions. At less than half the weight of traditional MMC or ceramic solutions, Aero Sekur's module will provide a significantly enhanced option for re-entry and will afford considerable savings in mission operation costs.

Expanding on the technology behind the module, Mark Butler, CEO for Aero Sekur said, *"Conditions of enormous heat flux are faced during re-entry that can destroy a module – options to date have been tile based solutions which are cumbersome, occupy considerable space and are extremely expensive to transport.*

"With the Aero Sekur SPEM, a flexible, inflatable heat shield is deployed at an altitude of 100km. This allows the capsule to slow down significantly as it crosses the upper layers of the atmosphere. The primary requirement is managing the extremely high temperatures generated at the leading surfaces - typically 1400ºC whilst maintaining temperatures of <80ºC close to the crew/payload. As the module descends through the lower atmosphere, a parachute and deceleration system is operated to further reduce the landing speed to 10 m/s. The inherent buoyancy of the module provides support during sea landings without additional flotation equipment. This means significant volume and operational cost savings."

The test at the Scirocco Plasma high-enthalpy wind tunnel at CIRA, the Italian Aerospace Research Centre, confirmed that Aero Sekur's module will withstand the extreme temperatures of around 1,250°C generated during atmospheric re-entry.

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