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MAJOR ADVANCE TOWARDS THE NEXT JET ENGINE

Reaction Engines Ltd. , a UK based company, has successfully completed another series of tests of the key component for a new engine, SABRE, that will enable aircraft to fly anywhere on Earth in under 4 hours, or directly into space and back to deliver satellites and other cargo.

The SABRE engine is capable of operating as a jet engine and a rocket engine, powering aircraft at up to five times the speed of sound within the atmosphere or directly into Earth orbit at twenty-five times the speed of sound. Its ground-breaking technology – an air pre-cooler - is designed to cool continuously the incoming airstream from over 1,000°C to minus 150°C in less than 1/100th of a second (six times faster than the blink of an eye), effectively doubling the current technical limits of jet engine speeds.

The tests, undertaken at Reaction Engines' facility in Oxfordshire, integrated the ground-breaking flight-weight pre-cooler technology with a jet engine and a novel helium cooling loop, demonstrating the crucial new technologies in the SABRE engine. This success marks another major advance towards the creation of vehicles like SKYLON – a revolutionary reusable space vehicle that will be powered by SABRE engines, designed primarily to transport satellites and other cargo into space.

Through this second series of testing, Reaction Engines has proven the following features of the SABRE's key pre-cooler component, demonstrating:

- aerodynamic stability and uniformity
- structural integrity
- freedom of vibration across a wide range above and beyond the flight envelope
- preliminary cryogenic cooling.

The third and final series of demonstration will commence next month, with the pre-cooler operating at very low temperatures, i.e. -150°C.

David Willetts, Minister for Universities and Science said:

“The engine being developed by Reaction Engines is a potential game-changer in terms of space technology. This successful testing validates the assessment made of the engine concept by the UK Space Agency back in 2010 and is yet another example of the UK's world class space industry. It would be a fantastic achievement if we could one day use this home-grown technology for our own commercial space launches.”

Since 2009, the European Space Agency has been involved, through a combined public and private venture-funded programme, in the development of technology for the SABRE engine and their current view is that “whilst still in the early stages of testing, the initial results for pre-cooling look promising. Also, as of today, ESA does not foresee any technical reason why the current test programme cannot be successfully completed by autumn 2012”.

SABRE has taken a team of over 30 British engineers 22 years to develop. Alan Bond, who founded Reaction Engines and has led the research from the start, said:

“Over the past two centuries, travel and transport has been powered by the steam engine, the internal combustion engine and, most recently, jet and rocket engines. The SABRE engine is the next logical step. SABRE will enable an aircraft to fly anywhere in the world in under 4 hours or a spaceplane to fly into orbit around the Earth – slashing the cost of space travel and creating new commercial opportunities in space. Thanks to the professionalism, expertise and dedication of the incredible team we have at Reaction Engines, this breakthrough puts the UK aerospace industry in pole position”.

Reaction Engines Ltd. is currently exhibiting at the Farnborough Airshow 2012, between 9-15th July, and the highlight of the display is the actual SABRE cooling assembly used in the latest series of breakthrough tests.

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Notes to editors

1. Reaction Engines Limited (REL) is a privately funded UK Company with core capabilities in the research, design, manufacture, development and testing of ultra-lightweight heat exchangers for aerospace applications and the advanced SABRE engines and vehicles, such as SKYLON, that they enable.
2. Developed by Reaction Engines over the last 22 years, SABRE (Synergetic Air-Breathing Rocket Engine) is a new engine class that can operate in both air-breathing and rocket modes. This advanced combined cycle air-breathing SABRE rocket engine enables aircraft to operate easily at speeds of up to five times the speed of sound or fly directly into Earth orbit. With the pre-cooler heat exchanger and other SABRE engine advanced technology development programmes nearly completed, the next stage of the SABRE programme will include a full engine demonstrator.
3. SABRE-powered reusable space planes like SKYLON will dramatically cut the cost of launching satellites by as much as 100 times. The global space market is worth £180 billion annually – £7.5 billion to the UK alone. This means the development of these vehicles offers major economic opportunities to the UK. It is estimated that the development stage for SABRE and the SKYLON satellite launcher alone will see investment of £7.5 billion, creating 70,000 jobs.
4. The viability of the SABRE engine has been independently validated in 2010 by the European Space Agency during a review commissioned by the UK Space Agency. The conclusion of that review was “ESA are confident that a ground test of a sub-scale engine can be successfully performed to demonstrate the flight regime and cycle and will be a critical milestone in the development of this program and a major breakthrough in propulsion worldwide.” (ESA Skylon Assessment Report, 6 May 2011).

More information about Reaction Engines, SABRE and SKYLON can be found on www.reactionengines.co.uk, including an interview with Alan Bond.