FACT SHEET

IXV: Intermediate eXperimental Vehicle
The IXV project is developing and flight-testing the technologies and critical systems for Europe’s future autonomous controlled reentry for return missions from low Earth orbit.

The experimental vehicle is 5 m long, 1.5 m high, and 2.2 m wide – about the size of a car – and weighs almost 2 t.

**Launch and recovery**

IXV will be injected into a suborbital path by a Vega rocket launched from Europe’s Spaceport in French Guiana in February 2015. IXV will separate from Vega at an altitude of 340 km. It will attain an altitude of around 412 km, allowing it to reach a speed of 7.5 km/s when reentering the atmosphere at an altitude of 120 km – fully representative of any return mission from low orbit. It will collect a large amount of data during its hypersonic and supersonic flight, while being controlled by thrusters and aerodynamic flaps.

The craft will then deploy a parachute to slow its descent for a safe splashdown in the Pacific Ocean to await recovery and analysis.

The complete mission will last for approximately 1 hour and 40 minutes.

**Mission operations**

The Mission Control Centre at the Advanced Logistics Technology Engineering Centre (ALTEC) in Turin, Italy, will closely monitor IXV during its mission. This facility will also be in charge of coordinating the activities of the entire ground segment, including the fixed ground stations in Libreville (Gabon) and Malindi (Kenya), and the naval station on the recovery ship in the Pacific Ocean.

**Space and ground segment activities**

**2014**
- May: IXV integration & qualification (Turin, IT)
- Jun–Aug: IXV environmental tests (Noordwijk, NL)
- Aug–Sep: IXV flight & ground segments deployment (worldwide)

**2015**
- Jan–Feb: IXV ground segment launch campaign (worldwide)
- Jan–Feb: IXV flight segment launch campaign (Kourou)
- Feb: Launch, mission & recovery (Kourou)

Last updated: 23.01.2015
IXV spacecraft

From the outer to inner layers, IXV comprises:
• Thermal protective shells of ceramics and ablatives to resist the extreme heat of reentry,
• Structural panels made of carbon-fibre reinforced polymer to hold inner elements in place during launch and landing,
• Functional and experimental subsystems equipment.

Components (from front to back):
• Avionics (power, data handling, telemetry),
• Parachute (supersonic multi-stage) and floatation devices,
• Actuators (thrusters and flaps).

Cost

It is expected to cost around €150 million for the design and development of the IXV flight vehicle, ground support equipment, and ground segment (mission control centre update, naval antenna, telemetry kits, communications network), along with qualification and mission operations. This includes expenses related to the recovery ship but excludes the cost of the Vega rocket.

Mission contractors

Thales Alenia Space Italia is the prime contractor for IXV’s space and ground segments, integrating competences from around 40 other European companies, universities and research institutes.

ESA Member States participating in the mission

The mission is primarily supported by seven member states: Italy, France, Switzerland, Spain, Belgium, Ireland and Portugal. Italy is providing the largest share of funding. Additional member states, such as Germany and the Netherlands, are providing complementary support to the mission.

Applications for controlled atmospheric reentry vehicles

• Reusable launchers stages (lower and upper),
• Robotic exploration (for example, sample return from Mars or asteroid),
• Servicing of orbital infrastructures (for example, International Space Station),
• Servicing of future generation satellites (for example, in-orbit refuelling or disposal),
• Microgravity experiments (for example, optimum time/cost ratio),
• Earth sciences (for example, high-altitude atmospheric research),
• Earth observation (for example, crisis monitoring).

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Looking to the future

The knowledge gained from the IXV mission will be key in ESA’s future plans involving controlled atmospheric reentry.

General information about this and ESA Launchers can be found at:
http://www.esa.int/Our_Activities/Launchers

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