Vega upper composite passes tests at ESTEC

Structural model of the upper composite of the Vega launch vehicle on the 'multishaker' electrodynamic shaker in the Test Centre at ESA-ESTEC. The octagonal structure at the top of the image is a mechanically representative model of a payload. Credits: ESA - A.Le Floc'h

The upper composite of ESA's new small launcher has passed its vibration tests at ESA's European Space Research and Technology Centre (ESTEC) with flying colours. Vega's components are built and tested at various locations across Europe. The first launch is planned for the end of 2007 from Europe's Spaceport in Kourou, French Guiana.

Vega, which is being built by European industry under the leadership of ELV SpA (Italy), is a small launch vehicle designed to carry payloads in the range 300 kg to 2.5 tonnes into low Earth orbits. The typical reference for Vega's launch capacity is to carry 1500 kg to a 700 km-altitude polar orbit. Vega will be particularly suitable for the launch of scientific and Earth observation missions.

Vibrations

During the launch of a rocket, vibrations occur due to engine ignition, the thrust of the engines and the high-speed flow of air over the body of the vehicle as it accelerates through the Earth's atmosphere. The upper composite that has just been tested is the top part of the launcher, which houses the navigation, communications and control equipment. The payload is carried on top of the composite, protected by a streamlined fairing, or nosecone. During testing, a mechanically representative model of a real satellite was used.

In order to confirm that the upper composite will be able to withstand the vibrations that it will experience during launch, it was mounted on the 'multi-shaker' in the Test Centre at ESTEC. This electrodynamic vibration table applied accelerations to the base of the composite while around 400 accelerometers and 40 strain gauges measured the movements and forces within the structure. This confirms that the design calculations are correct.

"The vibration tests went well and we are on schedule" said Vega Test Manager Wolfgang Teichert. "We have carried out most of the tests for the final stage of the launcher".

Final exam

At the end of 2006, reports on all the tests will be presented at the 'Critical Design Review'. If Vega passes this 'final exam', production of components for the qualification flight launcher can proceed.

Industry day

The fourth Vega industry day is taking place on Thursday 5 October 2006 at ESA-ESTEC and the adjacent Space Expo in Noordwijk, The Netherlands. All the space industry members committed to the Vega Small Launcher programme are involved. The industry day is an occasion for all participants in the Vega programme to share an overview of the key technical and programmatic achievements in the development activities being carried out under the responsibility of the three main industrial contractors for the Vega programme:

Vitrociset SpA (Italy) – ground segment Europropulsion SA (France/Italy) – solid propellant motor and P80 first stage ELV SpA (Italy) – launch vehicle It will also be an opportunity to focus on the upcoming programme milestones leading to the qualification flight. Later flights, planned in the context of the Vega Research and Technology Accompaniment (VERTA) programme, will also be discussed. VERTA includes support for five demonstration flights that will serve to launch selected ESA payloads and showcase Vega's capabilities.

Source: ESA