



Test facility boosts UK space industry

National Satellite Test Facility to provide the space industry with climatic, vibration, EMC and antenna testing capabilities in a single UK location for the first time

As the UK takes a firmer grip on its position in the new space race, the first contracts have been awarded to establish the National Satellite Test Facility (NSTF) in the country, which will be built and operated by the Science and Technology Facilities Council's RAL Space.

The NSTF will fulfil the need for the UK space industry to have world-class environmental testing facilities for payloads and satellites. The first three contracts relate to a test chamber, a vibration facility and a combined electromagnetic compatibility (EMC) and antenna measurement system.

Alongside the existing RAL Space assembly, integration and validation facilities – the NSTF will put all the test

equipment needed by industry and academia in one place.

SPACE TEST CHAMBER

The Angelantoni Test Technologies space test chamber will have an internal, usable size of 7m diameter by 12m in length, making it the largest of its kind in the UK and among the giants of Europe. It has a temperature range of 95K to 400K, providing the conditions needed to test a variety of complex science missions as well as commercial satellites for Earth orbit.

VIBRATION TESTING

Team Corporation will build the vibration facility, capable of testing satellites up to 7 tonnes using two electro-dynamic shakers. To realistically simulate

» The vertical planar scanner will be one of the largest antenna measurement systems in Europe; the National Satellite Test Facility, inset, is scheduled for completion in 2020

mechanical loads during a rocket launch, one shaker will operate in the vertical plane (Z axis), while the other will operate horizontally (X and Y axes).

EMC AND AMS

The combined EMC and antenna measurement system will provide an electrically clean environment so that a satellite's electromagnetic emissions can be accurately measured. It will also contain a planar near-field scanner to measure the performance of antennas used for communications between the satellite and ground stations.

Siepel SAS of France are manufacturing the chamber, with NSI-MI Technologies LLC of the USA being responsible for the AMS. Frequensys represents both companies in the UK and has been closely involved from the initial meetings, through the tendering process and design.

The result will be a high accuracy planar near-field antenna measurement system with a total scan area of 12m x 12m. This system will be one of the largest and most sophisticated in Europe and will be capable of testing a variety of antenna types and sizes. It will be specifically designed to meet the challenging requirements imposed by the satellite industry where antennas are large and measurement uncertainties must be very low.

A high-speed NSI-MI RF sub-system will be included to minimise test time and increase overall facility throughput. NSI-MI software will assist in data acquisition, processing, specification compliance and reporting. In addition to antenna-level pattern measurements, the system will include NSI-MI's Satellite Payload Test Suite. This package will maximise the utility of the AMS by adding system-level test capabilities that traditionally required additional systems.

UK SPACE INDUSTRY SIGNIFICANCE

According to Simon Young of Frequensys, the NSTF demonstrates a commitment to the UK space industry with a long-term future vision. "It shows that we have a real intention to test more satellites and potentially launch them in the UK," he says.

In addition, it provides a set of co-located world-class environmental test facilities in the UK offering industry a choice of where to go for testing, according to Young. "The EMC and AMS facility is the largest anechoic chamber to have been built in the UK for about 20 years and will be part of a facility that will not only provide EMC and AMS capabilities but will also have other space necessities such as vacuum testing," he concludes. **EE**