



Product testing in a real-world aerospace environment

Cobham Plc develops communications systems for challenging environments, enabling customers to stay connected across land, sea and air. Cobham Plc received funding from STFC's Bridging for Innovators Programme to help bring a new product to market.

Challenge

After developing a communications system that provides improved voice and data connectivity in aircraft cabins, Cobham Plc needed to test the product before going to market. To do this, the company required specialist facilities where it could warrant the new system against the natural neutron radiation environment experienced at altitude. However, the company did not have the capability to do this in-house.

Solution

- Acceptance onto the Bridging for Innovators programme, which provides funding for businesses to access STFC's large-scale science facilities.
- Access to STFC's ISIS Neutron and Muon Source facility.
- Funding for 48 hours of beam time on Chiplr - one of only three facilities in the world accepted as providing a good match to the aerospace radiation environment.
- Dedicated advice and support from STFC's experienced scientists, engineers and innovation experts.

Benefits

By accessing Chiplr at ISIS Neutron and Muon Source, Cobham Plc was able to formally assess the new communications system to ensure it adhered to safety standards. The results highlighted one software issue which was resolved in the final system ensuring that the product the company launched was of the optimum standard.

The ability to assess reliability and safety in a real-world aerospace environment, with the support of STFC scientists, has enabled Cobham Plc to take the product to market more quickly and cost-effectively than was previously possible. The new method for joining hemispherical and cylinder structures meets the stringent criteria of the space industry with regards to residual stresses in the weld.

"Accessing STFC's ISIS Neutron and Muon Source enabled us to overcome a significant barrier whilst we were taking a strategically important new product to market. We would not have been able to achieve this without the support gained through the Bridging for Innovators programme."

Richard Sharp, Managing Director, Cobham RAD Europe Ltd.



Why use neutrons?



Study structure

Neutron wavelengths are comparable to the spacings of atoms and molecules.



Study dynamics

Neutron energies are comparable to the time scales of molecular diffusion, vibrations and rotations.



Study magnetism

The neutron's magnetic moment can be used to study the microscopic magnetic properties of materials.



Penetration power

Neutrons can penetrate deep into matter (including many different metals) enabling the study of large samples – even within complex sample environments.



Non-destructive

As a non-destructive, non-invasive probe, neutrons are suitable for the characterisation of delicate and precious samples.



Versatile sample environments

Sophisticated sample environments enable measurements under operating conditions – including extreme temperatures and pressures.



Sensitivity to light elements

The neutron scattering power of nuclei varies in a random manner such that lighter atoms (e.g. H, Li) can be studied in the presence of heavier ones.



Isotopic contrast

Neutrons are sensitive to different isotopes of the same element, so isotopic substitution (e.g. H/D) can be used to highlight specific structural features.



Complementarity

Neutron scattering is highly complementary to other techniques, such as X-ray scattering, electron microscopy, magnetic resonance and computational methods.

How to work with ISIS

ISIS offers industrial users access to advanced analytical techniques and expert scientific and technical support for materials characterisation. Access options include proprietary use, academic partnerships, grant funded access, and the Industrial Collaborative Research and Development (ICRD) program.

For more information, email ISISindustry@stfc.ac.uk to discuss the most suitable method to solve your challenge.

