



Developing evidence for certification - autonomous remotely piloted systems

The Virtual Engineering Centre's unique 'sandpit' model allows technology organisations to enhance their capabilities through virtual innovation, accessing academic research and the latest scientific and technological infrastructure.

The Virtual Engineering Centre (VEC), in partnership with BAE Systems, developed a Virtual Engineering Simulation Laboratory (VESL) for the integration, testing and generation of evidence for certification of components of Autonomous Remotely Piloted Aircraft Systems (RPAS).

THE CHALLENGE

RPAS technologies are maturing rapidly, however the associated regulations to allow open access to civilian airspace are yet to be fully formulated.

Current UK practice is to allow Unmanned Aerial Systems (UAS) operate only in segregated airspace or in non-segregated airspace but with restrictions to line-of-sight operations, below 400ft only. UK industry is working with the regulatory bodies to develop a means by which UAS can operate alongside existing airspace users, in all classes of non-segregated UK airspace. Therefore these new technologies cannot yet be tested in the environment in which they will ultimately be used.

THE SOLUTION

The Virtual Engineering Centre developed tools and techniques that allow both industry and regulators to establish a 'design for certification' ethos within the supply chain where safety-critical software and hardware is required.

The processes include requirements capture and validation phases, as well as a means of testing and evaluating whole Unmanned Aerial Systems (UAS) and sub-system virtual prototypes, to be able to demonstrate compliance with the relevant airworthiness codes as early as possible in the design cycle.

THE BENEFITS

Having developed a robust and accurate process in the development of their virtual prototypes with the VEC, Primes and SMEs are able to integrate software models of UAS and sub-systems that conform to the applicable industry standards, into the VEC framework.

Linking this model to the High Performance Computing (HPC) facility accessible through the VEC's partnership with the Hartree Centre at STFC Daresbury Laboratory (Science and Technology Facilities Council), supporting evidence for certification can be generated.