

Workshop on Certification by Simulation of Rotorcraft



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On Nov. 9, 2022, the Rotorcraft Certification by Simulation (RoCS) project held a workshop at the European Rotorcraft Forum in Cologne, Germany. The workshop provided an overview of the RoCS project and the work undertaken to produce draft guidance material for the Rotorcraft Certification by Simulation (RCbS) process that RoCS is developing. The workshop was attended in person and online by more than 60 people, drawn from industry, research laboratories, certification organizations and academia.

RoCS is a partnership funded by Clean Sky 2, led by the Politecnico di Milano, and made up of the University of Liverpool, the University of Cranfield, the Netherlands Aerospace Center (NLR), the Germany Aerospace Center (DLR) and the Fondazione Politecnico, and with the active collaboration of Leonardo Helicopter Division and the European Union Aviation Safety Agency (EASA). The consortium is examining the requirements needed to use modelling and simulation in support of the certification process.

To achieve this aim, the first draft of guidelines, currently released on the www.rocs-project.org/guidelines site, has been produced. This draft contains a description of the structured RCbS process so that the credibility of the simulation features used can be identified. The guidelines present a detailed definition of the three main elements of the RCbS process: the flight simulation model, the flight simulator and the flight tests necessary for validation.

The opportunities offered by simulation in the fields of design and training are now well understood. However, the additional

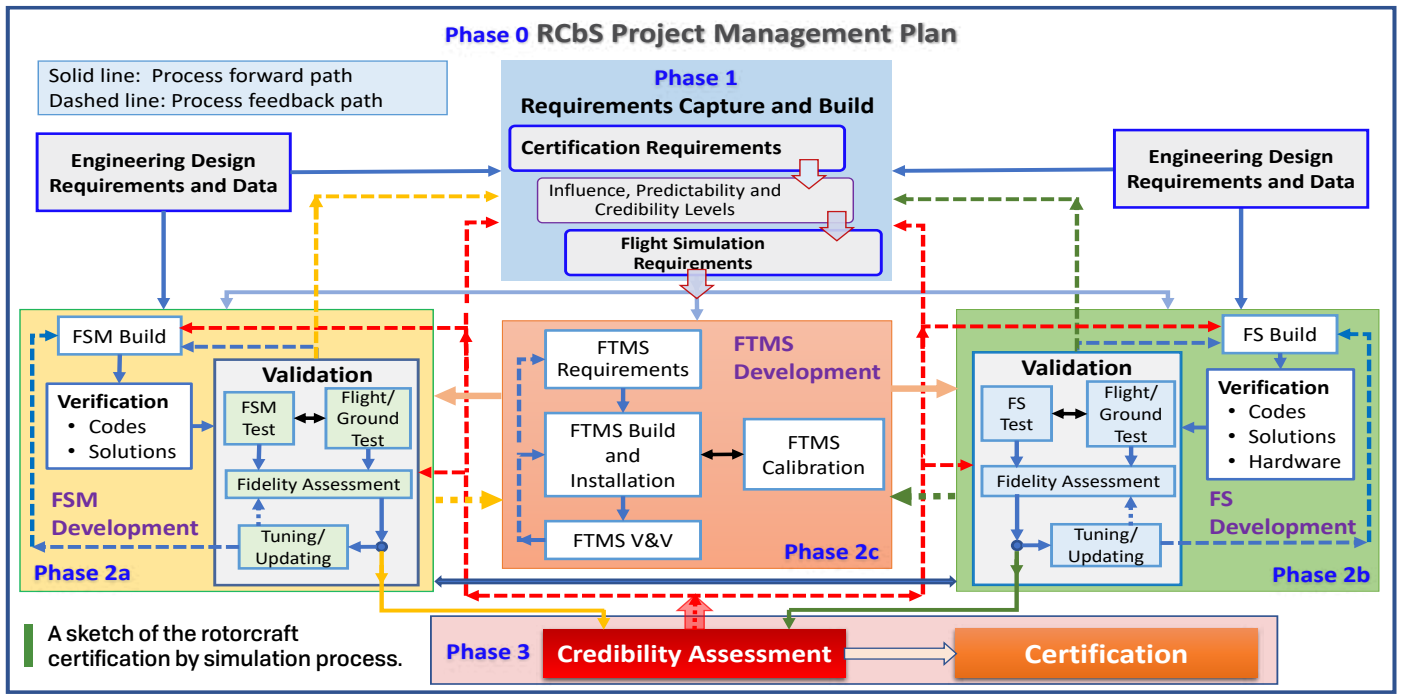
Participants of the RoCS workshop at the end of the day.



possibilities offered by the extension of virtual engineering, or so-called digital twins, are still underexploited. While even the most sophisticated flight simulators are unable to reproduce the infinite combination of variables that can be experienced in operational flight, it is recognized that the state of the art in flight modeling has achieved sufficiently high levels of fidelity to support the RCbS and remains a rapidly evolving field.

Therefore, although flight simulation cannot be expected to completely replace flight testing, it is reasonable to believe that it could become an effective method to evaluate scenarios that are extremely expensive, risky or even impossible to demonstrate in flight. The use of flight simulation can lead to a more rapid introduction of technological innovations that would otherwise require years of work to be certified.

The workshop explored these themes, allowing those in attendance to provide feedback on the RCbS process and the draft guidelines that were produced. Several representatives of vertical flight aircraft manufacturers joined the workshop, showing the strong interest that industry has in the possibility of having a well-defined and accepted approach that can be followed whenever simulation is considered the most viable and cost-effective mean to certify products. This, in turn, may



provide a means to introduce innovative solutions swiftly that can increase the safety of flight without requiring certification costs that may be not sustainable.

where simulation can be a key factor to permit meeting the challenging schedule for certification that many players in the eVTOL world set.

Very positive feedback on the proposed RCbS approach was also provided by the numerous representatives of the fledging electric vertical takeoff and landing (eVTOL) aircraft sector,

The RoCS team still welcomes feedback on the guidelines as it develops the next iteration of the guidance material planned to be released in the summer of 2023.

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