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## **7<sup>th</sup> European Workshop on Aircraft Design Education**

**EWADE 2005**

19-20 October 2005, Toulouse, France

### ***Final Report***

The European Workshop on Aircraft Design Education was the brainchild of Prof Rodrigo Martínez-Val, who organised the first meeting in Madrid in 1994 together with Prof Egbert Torenbeek and Dr Kevin Knowles. EWADE is now an established biennial forum, following workshops in Berlin, Bristol, Torino, Linköping and Brno. At the Brno meeting, in 2004, it was decided that the series should move to odd years to avoid clashing with major international aerospace meetings (notably ICAS). As a result of this, Prof Martinez-Val took the opportunity of his sabbatical placement in SupAéro, to organise the 7<sup>th</sup> Workshop in Toulouse, hosted by Prof Jean-Luc Boiffier of SupAéro. The purpose remains, as originally conceived, to provide a forum for the exchange of ideas and experiences in aircraft design education and to foster links with industry.

The Toulouse meeting heard 18 presentations over 2 days. These started with the invited keynote presentation given by Prof Dieter Schmitt, Vice President R&T for Airbus. Prof Schmitt gave a valuable industrial perspective on the importance of education in aeronautics. The theme of university-industry collaboration was picked up later in presentations from Alenia, Alcatel-Alenia Space and Politecnico di Torino (on industrial support for aerospace design education) and from Hamburg University of Applied Sciences (on aircraft cabin systems design).

The theme of industrial collaboration was taken a step further in the presentation by Prof Arthur Rizzi of KTH Stockholm who described an international collaborative design project, set up in co-operation with Bristol University, based on industrial project management practices. KTH also presented some of their software tools for teaching flight control design. Over the years the use of software in aircraft design education has grown – this having been a keen area for debate in the early years of EWADE.

Another area which has grown in recent years is systems engineering, driven by the requirements of industry to manage the design and integration of complex systems. It was noteworthy that the two universities who discussed this topic – Hamburg and Torino – both have very close relationships with their local aerospace industries.

A strong theme throughout the workshop was the design of UAVs. There are many reasons for this including the growth in roles for UAVs, the range of technical challenges in a UAV system and the ability of many universities to build and test small-scale UAVs at full scale. A good example of an on-going project to design a large UAV system was given by Prof Giulio Romeo of Torino, who described a HALE UAV project. At a smaller scale, Christoffer Jouannet described Linköping's most recent UAV project, which has led to a flying demonstrator. Kevin Knowles of Cranfield University at Shrivenham sounded a warning note over the design of micro UAVs, where very low Reynolds numbers can cause unusual aerodynamic effects not predicted by standard design textbook correlations.

It was a pleasure to welcome some new participants to the EWADE series, with presentations from universities in Seville, Cataluña and Patras. At the same time, it was interesting to hear updates on the aircraft design activities at Budapest and Brno, also on the renowned aircraft design course at Cranfield. The workshop presentations ended with a thought-provoking talk by Dr Trevor Young of Limerick on the challenges and conflicts of innovation in design.

The formal proceedings ended with a round-table discussion of some of technical issues raised during the meeting and of the venue for the 8<sup>th</sup> EWADE. It was proposed that the IMechE's Journal of Aerospace Engineering would consider a special issue on European aircraft design education and that selected presentations from the current EWADE should be the basis for invited contributions to this publication; Dr Knowles will follow this up with the publishers.

Finally, the participants enjoyed a visit to the Airbus A380 assembly facility. The support of Airbus for the workshop was greatly appreciated, as was all the hard work of the organisers. It was agreed that the next EWADE should be held in Samara, in Russia, in 2007. If this is not possible, then Patras in Greece was suggested as an alternative site.