

ICAS Secretariat, c/o DGLR, D-53175 Bonn, Germany
Phone: +49.228.3080519, Fax: +49.228.3080524
E-mail: icas@icas.org, Web: www.icas.org

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ICAS Workshop elaborates on Systems Integration

“Complex Systems Integration in Aeronautics” was the focus of the biennial workshop of the International Council of the Aeronautical Sciences (ICAS) held in Krakow, Poland on 31 August 2015. Full presentations made by leading aerospace industry experts are available (see www.icas.org).

ICAS President – Dr. Christian Mari of France said “Once again in this series of ICAS meetings and specialist workshops, full advantage was taken of this unique group of over 70 representatives from the world-wide aeronautics and aviation communities, interacting with invited international experts”.

The ICAS biennial workshop was part of the ICAS Programme Committee Meeting held from 30 August – 4 September 2015, co-hosted by the Polish ICAS Member, the Polish Society of Aeronautics and Astronautics (PSAA). Dr Susan Ying – Chief Integration Officer of the Commercial Aircraft Corporation of China (COMAC) and Programme Committee Chair of ICAS, led this timely meeting attended by leading experts in the field.

State-of-the-art aircraft features more and more integrated systems resulting from multiple requirements, a key point shared by Mr Remy from the Airbus Group Innovations (France), Mr Reginato from the Embraer Chief Engineer’s Office (Brazil), and Mr Miyakawa from Mitsubishi Heavy Industries (Japan). Traditional optimization and systems engineering approaches are challenged by these highly complex integrated systems. Novel evolutionary, incremental development approaches with increasing effort in the front-end and early virtual validation and verification are keys to addressing the challenges, was emphasized by Mr Fossier from the Thales Group (France) and Mr Roemelt from the Airbus Group (France). When these novel approaches were taken, the typical “cost growth” curve can be broken, as illustrated by the Gripen program example by Mr Holmberg, Dr Fredriksson, and Mr Pettersson from the Saab Aeronautics (Sweden).

A common theme shared by all speakers and concisely articulated by Dr Zhang from AVIC (China) is the important capability of “architecture” or “big-picture approach” to address the integrated systems and system-of-systems challenges. The need of simulation and model-based systems engineering are also take-aways from Dr Anderson’s presentation from Defence Science & Technology Group (Australia). It was recognized by all that academia needs to develop curriculum for preparing the people to work in industry to solve these complex systems integration problems.

Dr Ying concluded the proceedings by stating, “We are very used to the ‘divide then conquer’ for developing large-scale systems. However, in dealing with the large complex aeronautical systems, it will be important to make a paradigm shift and take the big-picture view to focus a great deal in the front end; namely, taking the ‘conquer then divide’ approach.”

The outcomes of the workshop will be used to inform the next ICAS Congress – to be held in Daejeon, South Korea, 25-30 September 2016 (see www.icas2016.com), of the recent achievements and most important challenges associated with System Integration issues.

For more information contact the ICAS Executive Secretary – Mr Axel Probst (icas@icas.org)

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