



# Getting Started the CEAS Technical Committee Aircraft Design (TCAD)

TCAD started with the aim to better harmonize research in aircraft design and combine this with education in aircraft design by establishing a dedicated **CEAS Technical Committee Aircraft Design**. The committee was formed out of the already existing CEAS Specialists' Network "Vehicle Design". The activities of "Vehicle Design" had so far been equivalent to the activities of the European Workshop on Aircraft Design Education (EWADE). A complementary new activity focusing on research was added to found the joint CEAS Technical Committee Aircraft Design. The committee is organized in two sections taking account of the two subjects – research and education.

## 1 The **Research Section** of the Technical Committee Aircraft Design

### 1.1 Challenges

The rising challenges for air transport require novel vehicles with significantly enhanced operational efficiency. Optimizing vehicles for operational targets requires considering all relevant interactions with the air transport system. In the same time, novel and potentially radical technologies need to be modeled with an appropriately high level of fidelity in order to resolve all relevant interdisciplinary interactions.

Research into this topic is characterized by the following challenges:

- High number of competing concepts.
- High number of heterogeneous models.
- High effort necessary for significant findings.
- Problematic validation of results.

### 1.2 Scope

TCAD is a framework within which the European actors with serious research in aircraft design work together. Added values are:

- Exchange of information on finalized, ongoing and planned activities.
- Collaboration in complementary research.
- Cross-validation and benchmarking of similar research.
- Fostering synergies and eliminating unnecessary efforts.

### 1.3 Realization

Major meetings are organized once per year. They are always co-located with the CEAS conference. In the intermediate years the meetings can be co-located with the ICAS conference or a major AIAA conference. Alternatively, meetings in intermediate years can be hosted by one of the TCAD members. A steering group will be in charge of organizing the meetings.

The committee plans to organize an internet/intranet page for the exchange of information. A newsletter or an online forum might be other useful modes of communication. Contributions to the CEAS/ICAS conference program committee, the CEAS Journal and the CEAS bulletin could be provided if desired.

It is intended to establish an active dialogue with related groups and bodies such as ACARE, IFAR, AIAA (i.e. Technical Committees Design & MDO), EREA, IMG4/EUROMART and EASN.



## 1.4 Topics

Work is ongoing by active members to define a list of topics such as future scenarios, requirements and target functions for OAD, future technologies, analysis tools, networked analysis, standardization of interfaces, multidisciplinary optimization, collaboration techniques, management of knowledge, etc.

## 1.5 Implementation

Activities to implement the research section are coordinated by DLR. CEAS member organizations will be contacted. A list of confirmed participants ensuring a minimum critical mass will be compiled by fall 2014. The organization of the research section of the committee, its technical content and way of working will be refined by the launching members and will be democratically developed in the future. The formal founding with an initial meeting was conducted during the CEAS conference 2013 in Linköping. Election of the steering group for the research activities will follow.

DLR already organized three Symposia on Collaboration in Aircraft Design. The “3<sup>rd</sup> Symposium on Collaboration in Aircraft Design” was co-located with the CEAS 2013 conference

<http://www.ceas2013.org/index.php/symposia-and-workshops/3rd-symposium-on-collaboration-in-aircraft-design>

This symposium was the founding meeting of the Technical Committee Aircraft Design and could be seen as the “1<sup>st</sup> Symposium of the CEAS Technical Committee Aircraft Design”.

Future symposia are organized as activities of the CEAS Technical Committee Aircraft Design. The “2<sup>nd</sup> Symposium of the CEAS Technical Committee Aircraft Design” is scheduled from 25<sup>th</sup> to 27<sup>th</sup> of November 2014 and is hosted by ONERA in Toulouse. For more information see

<http://w3.onera.fr/ceas-tcad2014>

## 2 The Education Section of the Technical Committee Aircraft Design

The education section of the CEAS Technical Committee Aircraft Design is made up of the already existing and active CEAS Technical Network “Vehicle Design” (<http://www.ceas.org/ABN.php>). The activities of “Vehicle Design” have so far been equivalent to the activities of the European Workshop on Aircraft Design Education (EWADE) (<http://www.AircraftDesign.org>) with its bi-annual European meeting.

### 2.1 History

The history of the European Workshop on Aircraft Design Education dates back to 1994 when the first meeting was hosted by the University of Madrid (ETSIA). Other workshops followed with an increasing number of participants. All workshops were arranged with financial support and contributions of the industry. Since 1994 EWADE is known as an affectionate community of people with similar interests. Today, everyone is welcome to participate and to contribute with a presentation or poster. The continuous history of successful EWADE workshops proves its relevance for the community:

- 1<sup>st</sup> Workshop: 1994 Madrid
- 2<sup>nd</sup> Workshop: 1996 Berlin
- 3<sup>th</sup> Workshop: 1998 Bristol
- 4<sup>th</sup> Workshop: 2000 Turin
- 5<sup>th</sup> Workshop: 2002 Linköping
- 6<sup>th</sup> Workshop: 2004 Brno
- 7<sup>th</sup> Workshop: 2005 Toulouse
- 8<sup>th</sup> Workshop: 2007 Samara
- 9<sup>th</sup> Workshop: 2009 Sevilla
- 10<sup>th</sup> Workshop: 2011 Naples
- 11<sup>th</sup> Workshop: 2013 Linköping (integrated into the CEAS conference)



In 2000 after the Turin meeting the workshop's web page was established with the URL: <http://www.AircraftDesign.org> and a database of participants is maintained since that time. Only after the next workshop 2002 in Linköping the abbreviation "EWADE" became popular among participants. Since 2009 the EWADE workshops are announced on the CEAS Calendar and activities were linked to the CEAS Specialists' Network "Vehicle Design".

## 2.2 Organization

After the Madrid Workshop in 1994 it was agreed that workshops would be organized every two years, hosted by those participants who can find sufficient financial support from their university and from their local or national industry. Objectives were formulated as follows:

- To allow European lecturers concerned with Aircraft Design to continue their active collaboration.
- To discuss Aircraft Design problems as regards research and education.
- To enhance close cooperation with the aerospace industry for the two aspects mentioned above.

In order to allow local organizers the greatest possible freedom and to keep the initiative open as possible to those who are interested to join at any time, it was decided, to minimize any formal burden. With EWADE being inherently "European" it became clear that EWADE needs to support the ideas of CEAS. Being the heart of the CEAS Specialists' Network "Vehicle Design" emphasized the European dimension of EWADE's activities and spirit and returned something to CEAS. However it was felt that the Network "Vehicle Design" could do more beyond its current educational focus. The idea of teaming up with collaborative research activities launched by DLR is the answer to this ambition.

## 3 Joining Activities into the Technical Committee Aircraft Design

An agreement on combining the CEAS Specialists' Network on "Vehicle Design" with the new activity on research as proposed by DLR as member of DGLR into a joint Technical Committee named "Aircraft Design" has been met with the chair of the CEAS network and DGLR Coordinator for Manned Air Vehicles (Leiter Fachbereich L2), Prof. Dr. Dieter Scholz. Subsequent activities are now performed in cooperation.

For this reason two sections for research respectively for education were established which are organized in a synergistic but independent manner.

The first outcome of this was the "11<sup>th</sup> EWADE Workshop" and the "3<sup>rd</sup> Symposium on Collaboration in Aircraft Design" co-located with CEAS 2013 Air and Space Conference bringing together most relevant experts in Europe in the field. This event was an excellent opportunity for CEAS to found the Technical Committee Aircraft Design with its research section and its education section.

## 4 CEAS Board Decision and Member Decisions in 2013

The CEAS Board of Trustees approved on 7th March 2013 the proposal to form a Technical Committee Aircraft Design. The new structure was presented to the participants during the 3<sup>rd</sup> Symposium on Collaboration in Aircraft Design (now seen as the 1<sup>st</sup> Symposium of the CEAS Technical Committee Aircraft Design). Likewise, the new structure was presented and also controversially discussed during the 11<sup>th</sup> European Workshop on Aircraft Design Education. Both activities taking place during the CEAS conference 2013 in Linköping.



## 5 Contact

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