

EREA is growing

The year 2012 was an important year for EREA: New organisations joined the Association and some existing members upgraded their membership Status. With these changes, EREA has an even more relevant and important voice and role to play in representing the Aeronautics Research Establishment in Europe.

Three new membership applications came in from Portugal, Switzerland and Russia, whereas the Austrians decided to renew their participation, and one of the historical associated members decided to apply for full membership.

After the Board and General Assembly decision taken May and December, CEIIA from Portugal and VKI from Belgium (previously associated member) became new EREA full members. CSEM from Switzerland and AIT from Austria became associated members. The Russian Research Centre TsAGI became a strategic partner of EREA.

With its new members and strategic partner, EREA now represents more European national research centres in aviation than ever before and even reaches out to countries outside the European Union.

EREA, its board, active groups and researchers warmly welcome all the newcomers and actively works to even widen the family, with the aim to further improve the European cooperation in aviation research.

EREA membership status since January 1st 2013:

Full Members: CEIIA (Portugal), CIRA (Italy), DLR (Germany), FOI (Sweden), ILOT (Poland), INCAS (Romania), INTA (Spain), NLR (the Netherlands), ONERA (France), VKI (Belgium) and VZLU (Czech Republic).

Associated Members: AIT (Austria) and CSEM (Switzerland)

Affiliated Member: AFIT (Poland, affiliated to ILOT)

Strategic Partner: TsAGI (Russia)

EREA in numbers - 2011

Number of employees in aviation	4140
Number of employees in aerospace	8250
Internal aviation research	461 M€
Average revenue from EU projects	58M€
Number of PhD thesis finalized	177
Number of publications including technical reports	6215
Publications in refereed journals	1252



Full members:



Associate members, Affiliate member & Strategic partner



EREA Award 2012

The article “**Computational Drag Prediction of the DPW4 configuration using the Far-Field Approach**”, written by D. Hue and S. Esquieu and published in 2011 in the Journal of Aircraft volume 48, number 5, pages 1658-1670, presents the numerical studies carried out at ONERA-The French Aerospace Lab in the framework of the 4th Drag Prediction Workshop. The international DPW series was initiated in 2001 by a working group of the AIAA Applied Aerodynamics Technical Committee. The first objective was to assess the state-of-the-art computational methods as practical aerodynamic tools for aircraft drag and moment predictions. Over the years, it has provided an impartial forum for evaluating the effectiveness of existing codes and modeling techniques using Navier-Stokes solvers.

The publication of ONERA follows the test cases proposed by the DPW4 Committee to the workshop participants: first, a grid convergence process and a downwash study are presented, and then the Mach and Reynolds numbers effects are investigated. All the meshes used in this work are structured grids provided by the Committee. All the Reynolds-Averaged-Navier-Stokes computations are performed with the ONERA-elsA solver and the Spalart-Allmaras turbulence model. Furthermore, the article gives a detailed description of the far-field extraction methods of ONERA which allow determining the values of the different physical drag components (viscous, wave and lift-induced productions). Concerning drag and moment predictions of the DPW4 configuration, a very good agreement has been observed between ONERA results and the near-field coefficients computed by other major DPW4 participants such as Boeing or Airbus.

The first author David Hue works in the Applied Aerodynamics Department of ONERA-The French Aerospace Lab where he arrived in 2009. Born in Lyon (FRANCE) in 1984, he graduated from the engineering school ENSEEIHT of Toulouse in 2008 with a degree in Fluid Mechanics. In 2007, he attended Polytechnique Montreal where he studied Aerodynamics and Computational Fluid Dynamics. At the end of his education, he

worked for several months in the automotive sector. Then, he came back to the Civil Aircraft Unit of ONERA where he had completed an internship a year before. Since his return to the world of aeronautics, he has been working on various research topics such as CFD methods, drag extraction, surface imperfections, laminarity... He is an AIAA member and regularly participates in international conferences and publications. His biography has been included in the “30th Pearl Anniversary Edition” of Who's Who in the World and within “2000 Outstanding Intellectuals of the 21st Century” of the International Biographical Centre of Cambridge.

The second author Dr. Sébastien Esquieu worked in the Applied Aerodynamics Department for more than 10 years. He left ONERA in 2010 to join the CEA French agency. He was the internship supervisor of David Hue who is truly grateful to him.



Handover of the EREA medal/award to Dominique Nouailhas (ONERA), on behalf of the winner.

EREA Young Researchers EVENT 2012 Brussels

For the fourth consecutive year, EREA organised an event specially planned and aimed at Young Researchers working in EREA research organizations. The 2012 edition, hosted by the European Parliament, took place on the 3rd of December. Over these years, such an event has given EREA the opportunity to have a feedback from young generations on topics that may be used to better tackle the future of research. It is also a unique occasion for the attendees to share views and experiences in a European environment, where they can meet colleagues and build up links for future cooperation.

In the 2012 edition, two different topics were selected for discussion: Safety Research needs for the future and Researchers career and mobility. Dr. Hervé Consigny, Deputy Technical General Director at ONERA, Prof. J. Hoekstra, Dean of the Delft Faculty of Aerospace and Dr. S. Tang, SNE at the European Commission were invited to conduct the event, providing their experience and expertise and

moderating discussions among young researchers from eleven European countries.

<http://erea.org/911/report-from-erea-young-researchers-event-2012-brussels>



EREA Annual Event 2012

On 3rd December 2012, the EREA Board members welcomed about 80 representatives from the European Parliament, European Commission, National and Regional ministries, as well as representatives from industry and research organisations at the traditional EREA Annual Event, this year organised in the Stanhope Hotel, Brussels.

The EREA Chairman, Prof. Rolf Henke, presented a short review on the EREA activities in the last year. After a short outlook on 2013 activities he introduced Mr Eric Dautriat as the key note speaker. Mr. Dautriat presented an overview on the current Clean Sky activities. As EREA has provided a position on the Clean Sky follow on, Mr. Dautriat also informed on the state of play in the preparation of Clean Sky 2, in which he expects major contributions to the work within Clean Sky 2 by EREA and its members.

The key note address was followed by the handover ceremony of the EREA best paper award 2012 to the winner David Hue, ONERA, for the paper "Computational Drag Prediction of the DPW4 configuration using the Far-Field Approach".

After the official speeches, the participants were invited to continue the evening with a buffet dinner.



EREA Board together with key note speaker Eric Dautriat and Ms. Manuela Soares, new director transport at the European Commission, DG RTD.

Future Sky

EREA is now proposing Future Sky, a Joint Research Initiative in which development and integration of aviation technologies is taken to the European level. Future Sky is based on the alignment of national institutional research for aviation by setting up joint research programmes. EREA believes institutional co-operation of European research establishments is the best guarantee to ensure technological development to the benefit of European society and industry, beyond the current SESAR and Clean Sky timescales.

The overall goal of Future Sky will be "Twenty Four-Seven". This concept describes the full airside mobility, 24 hours a day, 7 days a week, resilient against any impacts e.g. from disruptive events like extreme weather, in line with the goals laid down by FlighPath 2050. The joint programmes that make Future Sky all contribute to this overall goal and will therefore be called Twenty Four-Seven Enablers (TSE).

For Future Sky currently four TSE are foreseen: A first TSE on safety, followed by joint programmes focusing on the vehicle, the air transport system and energy.

Although Future Sky finds its origins in the alignment of the research programmes of the national research establishments, industry and universities are explicitly invited to join Future Sky. EREA has already been in close contact with the European Commission to discuss the possible content of Future Sky. EREA foresees a continued collaboration with the European

Commission, not only through possible co-funding mechanisms under Horizon 2020, but also in giving guidance for the set-up and management of the joint research initiative.

Preparations for the set-up of the first TSE on safety are under way: safety experts of EREA members have prepared the outline of this joint programme. EASA and EUROCONTROL have also been consulted and ready to be on-board of Future Sky's first joint research programme.



EREA's New Full Member: CEIIA Interview to CEIIA's CEO, Eng^o José Rui Felizardo

CEIIA has recently joined EREA. Why did CEIIA take this decision?

CEIIA is a Portuguese research center whose activity is market-oriented and that has been largely growing since its foundation, in 2001.

Today, CEIIA employs 180 staff and plays an important role, within Portugal and alongside its international partners, ensuring the best practices and state-of-the-art methodologies. This implies being connected to the top aeronautical research entities of Europe. EREA is the place where we want to be.

To what extent do you believe the cooperation between European Research Entities in Aeronautics is beneficial?

The importance of cooperation has been increasing in the last few years.

Today, cooperation is key for growth of any research and innovation entity, as it strengthens capacities and opens horizons.

In CEIIA, we believe that institutional frameworks must be developed for European integration and for improving trans-boundary cooperation, in order to achieve internationally agreed development goals. These goals are clear and each member of the European aeronautical community – smaller or bigger – plays a unique role on their integrated achievement. No entity can achieve these development goals on its own. Cooperation is key.

How can the cooperation between European Research Entities, Industry and Academia be improved?

We have to ensure and do our best to increase convergence of industrial and applied goals in European aeronautics.

On the other hand, not always the timings of industry and Research Entities are the same.

Most of the times, industry has quicker objectives with respect to R&D entities. It is important that the industry roadmap can be shared with R&D entities at the right time, allowing R&D agents to reach results on time. At the same time, R&D entities must prioritise accordingly.

Europe is undergoing a profound economic crisis. In your view, will it affect the performance of the Research Entities and the development of new knowledge?

It is sure that this crisis will impact the R&D funding within Aeronautics and other technological fields. Therefore, it is important that all R&D activities should be oriented towards industrial innovation. Probably, the RE's will have to adapt their working methodology and timing to the industry in order to improve the existing dynamics.

What role do you think your country will play to boost competitiveness and support the creation of employment in aeronautics?

Portugal has many SME's focused on innovation. These SME's have flexible structures, making them particularly ready for the development of new solutions, increasing competitiveness through innovation.

Projects like EMBRAER's KC-390 will be fundamental to bring energy to the Portuguese industry and to improve employment figures.

And what role will CEIIA play in relation to its national industries and ambitions? For instance, do you believe sufficient support will be provided by CEIIA on promoting the right level of education of engineers, fulfilling national industry needs?

As an innovation center, CEIIA bridges the gap between aeronautical industry and academia in Portugal. A strong effort to provide realistic knowledge to the Portuguese students of Aeronautical Engineering has been made in the last few years. CEIIA knows what the aeronautical industry needs and will continue to fulfill its mission, contributing to a better matching between education and industrial needs.



EREA's new Associated Member – Switzerland's CSEM Interview to CSEM's CEO, Dr. Mario El-Khoury

CSEM has recently joined EREA. Why did CSEM take this decision?

There are many reasons: first of all, we believe our technology platforms can be applied to Aeronautics, helping fulfill the needs of the main actors in this domain. So we are working hard to increase our presence in this field and to be known as a supplier of high value added and innovative solutions. To belong to a well-known association like EREA is an opportunity to come into regular contact with prestigious European research centers increasing our visibility in aviation and aeronautics.

To what extent do you believe the cooperation between European Research Entities in Aeronautics is beneficial?

In a very competitive and global world it is clear that only a joint European effort in research and innovation is the way to strengthen the very demanding European Aeronautics field. Industrial needs and environmental goals allow to develop cutting-edge technological solutions that without cooperation would be difficult if not impossible to reach.

How can the cooperation between European Research Entities, Industry and Academia be improved?

Cooperation among RTOs, Industry and Academia can be improved based on mutual respect and understanding of their respective roles in the whole product chain: from conception to commercialisation and looking for complementarities and synergies instead of competition.

Another way to increase this cooperation would be to open national programmes to third parties: a Europe without borders would help look for the best solutions to a specific problem independently of the country.

Europe is undergoing a profound economic crisis. In your view, will it affect the performance of the Research Entities and the development of new knowledge?

In our opinion the economic crisis is an opportunity to help industry innovate to resist and become more competitive. In Switzerland special measures were put in place by the state to boost innovation and help mainly SME during the crisis. This was a clear opportunity for us to fulfill our mission to innovate and transfer our technologies to industry.

However, this does not imply that the negotiation of projects with industry became easier than before the crisis, quite to the contrary: it is more difficult and the negotiations take longer but most of the time we succeed.

What role do you think your country will play to boost

competitiveness and support the creation of employment in aeronautics?

As mentioned before, mid-2011 the Swiss federal council put in place a special innovation programme to boost competitiveness and help Swiss companies innovate as a way to find a differentiator from their competitors. During the special measure period, CSEM was massively contacted by Swiss companies to become their scientific partner and among others, a very interesting Aeronautics project with a main Swiss aeronautics actor was granted.

And what role will CSEM play in relation to its national industries and ambitions? For instance, do you believe sufficient support will be provided by CSEM on promoting the right level of education of engineers, fulfilling national industry needs?

The mission of CSEM is to enhance the competitiveness of industry by developing applied technology platforms in micro- and nanotechnologies and ICT and transferring them to the industrial sector. So during this difficult time our mission and role in Switzerland remains of course the same and as mentioned previously, it becomes even more important to help our industry innovate.

In particular, CSEM inaugurated the "Post Doc for Industry" programme in 2012. Through it, CSEM gives researchers with doctoral degrees the opportunity to transform the subject of their doctoral thesis into an application for an already established industry or to create a start-up based on the results of their research.

The dynamic and professional environment inside CSEM fosters new talents to face the industrial challenges of tomorrow in Switzerland and in Europe.



NLR makes more efficient production of composites possible

A new fibre-overbraiding technique has the potential to improve efficiency in the production of composite structures. A new simulation programme reduces costly trial runs with the modern overbraiding machine.

NLR (National Aerospace Laboratory) is assisting company Eurocarbon with the refinement of braiding technology used to produce hollow composite structures. The project – ‘Innovating the overbraiding design process to optimise the development of composite aircraft structural components’ (OBODAS) – focuses mainly on efficiency. The simulation programme will enable Eurocarbon to achieve significant savings in development and production costs for composite structures. On paper, the principle of overbraiding is simple: a machine equipped with dozens of spools, wraps fibres around a mould that is shaped like the composite component to be produced. The fibre form is then impregnated with resin, which results in the composite structure. But the process has drawbacks. The shape of the structure can affect the distribution of the fibre layers and thus in turn alter the material properties of the entire composite structure. To counteract these adverse effects, the braiding machine has to undergo trial runs to determine the correct settings. These tests are costly in terms of both labour and material. This is where the results of the OBODAS project are helpful.

NLR engineers based the development of this simulation environment on Knowledge Based Engineering techniques, applying available knowledge of the overbraiding process to simulate and optimise all aspects of the process. The data generated by the simulation programme can be directly converted into settings for the overbraiding machine. Trials with the simulation programme, including the user interface, have already confirmed that OBODAS works effectively.

In the OBODAS project, NLR worked in collaboration with the University of Twente and Eurocarbon. The project was supported by NL Agency of the Dutch Ministry of Economic Affairs.

