



The Quarterly
Bulletin of the

CEAS

COUNCIL OF EUROPEAN AEROSPACE SOCIETIES

3AF-AIAE-AIDAA-CzAeS -DGLR-FTF-HAES-NVvL-PSAA-RAAA-RAeS-SVFW-TsAGI-VKI



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March



ON 16 JANUARY 2014 IN PARIS, THE CEAS PRESIDENT DAVID MARSHALL
PRESENTED THE CEAS GOLD METAL TO LOUIS GALLOIS, FORMER EADS
CHIEF EXECUTIVE AND PRESENT GENERAL COMMISSIONER FOR PUBLIC
INVESTMENT IN FRANCE

WHAT IS THE CEAS ?

The Council of European Aerospace Societies (CEAS) is an International Non-Profit Association, with the aim to develop a framework within which the major Aerospace Societies in Europe can work together.

It presently comprises 15 Member Societies: 3AF (France), AIAE (Spain), AIDAA (Italy), CzAeS (Czech Republic), DGLR (Germany), FTF (Sweden), HAES (Greece), NVvL (Netherlands), PSAS (Poland), RAAA (Romania), RAeS (United Kingdom), SVFW (Switzerland), TsAGI (Russia), VKI (Von Karman Institute, Belgium) and EUROAVIA.

Following its establishment as a legal entity conferred under Belgium Law, this association began its operations on January 1st, 2007.

Its basic mission is to add value at a European level to the wide range of services provided by the constituent Member Societies, allowing for greater dialogue between the latter and the European institutions, governments, aerospace and defence industries and academia.

The CEAS is governed by a Board of Trustees, with representatives of each of the Member Societies.

Its Head Office is located in Belgium:

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www.ceas.org

WHAT DOES CEAS OFFER YOU ?

KNOWLEDGE TRANSFER:

- A well-found structure for Technical Committees

HIGH-LEVEL EUROPEAN CONFERENCES

- Technical pan-European events dealing with specific disciplines and the broader technical aspects
- The CEAS European Air and Space Conferences: every two years, a Technical oriented Conference, and alternating every two years also, a Public Policy & Strategy oriented Conference

PUBLICATIONS:

- Position/Discussion papers on key issues
- CEAS Aeronautical Journal
- CEAS Space Journal
- CEAS Quarterly Bulletin
- Aerospace Events Calendar – www.aerospace-events.eu

RELATIONSHIPS AT A EUROPEAN LEVEL:

- European Commission
- European Parliament
- ASD (AeroSpace and Defence Industries Association of Europe), EASA (European Aviation Safety Agency), EDA (European Defence Agency), ESA (European Space Agency), EUROCONTROL
- Other European organisations

EUROPEAN PROFESSIONAL RECOGNITION:

- Directory of European Professionals

HONOURS AND AWARDS:

- Annual CEAS Gold Medal to recognize outstanding achievement
- Medals in technical areas to recognize achievement

YOUNG PROFESSIONAL AEROSPACE FORUM

SPONSORING

THE CEAS MANAGEMENT BOARD

IT IS STRUCTURED AS FOLLOWS:

- General Functions: President, Director General, Finance, External Relations & Publications, Awards and Membership.
- Two Technical Branches:
 - Aeronautics Branch
 - Space Branch

Each of these two Branches, composed of specialized Technical Committees, is placed under the authority of a dedicated Chairman.

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EDITORIAL

CEAS 2025



Fred Abbink,
CEAS President 2014

First of all is it a great honour for me to be elected CEAS President for 2014. And with the competent CEAS Officers and Board of Trustees it will be a great pleasure to work on the further strengthening of CEAS. In 2015 we will celebrate that it was 10 years ago that the 8 constituent Member Societies signed the Statutes and Bylaws of the Council of European Aerospace Societies. This new Council was the successor of the Confederation of Aerospace Societies that was founded in 1993 at the International Paris Air show.

And if we look back to what was reached in the 10 years of the new CEAS, there is reason for considerable satisfaction. CEAS has 15 Member Societies. The CEAS publications as the CEAS Quarterly Bulletin and Aeronautical and Space Journals, the biennial CEAS European Air and Space Conferences, the relations with European Commission and Parliament, EASA, ASD, ESA, EDA and EUROCONTROL, the Young Professionals Aerospace Forum and the yearly CEAS Gold Medal to recognise outstanding achievements.

But it is also necessary to look forward to the next 10 years: what is necessary to further increase the strength of CEAS? We have to look critically at our Mission, Vision and Strategy for CEAS 2025. How can we strengthen the relation with the individual members of our CEAS Membership Societies? How can we further support the aerospace students and young professionals, necessary for the future of our European Aerospace manufacturing Industry and Air Transport Industry, Research, Development, Test and Evaluation? How can we strengthen our relation with the European Organisations as ACARE, EREA as well as with the international organisations with which CEAS has established Memorandums of Understanding.

I look forward to use the year 2014 to start developing the CEAS Vision and Strategy the next ten years to be presented at the CEAS 2015 Conference in Delft.



ABOUT FRED ABBINK

Graduate in Electrical Control Engineering at the Technical University of Delft in 1968, Fred Abbink has devoted his whole career to aerospace. Among the main milestones which mark his cursus:

- 1969 - 1981:** manager in a number of avionics projects at NLR;
- 1981 - 1988:** Head of NLR's Flight Testing and Helicopter Department;
- 1981 - 1997:** part-time professor in aircraft instrumentation and avionics at Faculty of Aerospace Engineering TU Delft;
- 1988 - 2005:** Technical Director of NLR;
- 1996 - 1998:** detached from NLR to be Programme Director for Aeronautics at DLR, the German Aerospace Centre, Cologne;
- 2005 - 2009:** Director General of NLR;
- 2006 - 2008:** President of the International Council of Aeronautical sciences (ICAS).

Since his retirement, Fred Abbink is member of various advisory boards: EU Clean Sky and EU SESAR in particular.

Among other distinctions, Fred Abbink is Fellow of the American Institute of Aeronautics and Astronautics (AIAA), Member of the Air and Space Academy, Member of the Netherlands Academy of Technology and Innovation, Knight-officer in the Netherlands Royal Order of Oranje Nassau and Honorary Fellow of ICAS.

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THE GENERAL ASSEMBLY MEETING OF 17 JANUARY 2014

The CEAS General Assembly Meeting took place in Paris, 17 rue Hamelin (16^e), on Friday 17 January at 09:00.

The nominations of Trustees are here after listed:

Discharge of Trustees: Dr Leandro B. Fernandez Sainz (AIAE) and François Gayet (3AF).

Re-elected Trustees: Pierre Bescond (3AF) – Valentin Silivestru (AAAR) – Ion Fuiorea (AAAR) – Franco Persiani (AIDAA) – Amalia Ercoli Finzi (AIDAA) – Philip Nickenig (DGLR) – Petter Krus (FTF) – triantafillos Tsitinidis (HAES) – Jacek Rokicki (PSAA) – David Marshall (RAeS) – Paul Bailey (RAeS) – Jürg Wildi (SVFW) – Andrey Shustov (TsAGI).

Appointment of new Trustees: Jacques Sauvaget (3AF) – Estefania Matesanz (AIAE).

The responsibilities within the Board of Trustees are distributed as follows:

President: Fred Abbink

Director General: Mercedes Oliver Herrero

Vice-President External Relations and Publications:

Pierre Bescond

Vice-president Awards and Membership: Kaj Lundahl

Vice-President Finance: Paul Bailey

Chairman Aeronautics Branch: Christophe Hermans

Chairman Space Branch: Constantinos Stavriniadis

THE 25th TRUSTEES BOARD MEETING

The Trustees Board Meeting followed the General Assembly. It was conducted by Fred Abbink, who is succeeding to David Marshall at CEAS's presidency. Among the decisions taken during this session, three are emerging: (i) The CEAS2015 Conference will be held from 7 to 10 September 2015 in the Congress Centre of Delft Technical University (NL); (ii) An agreement of co-operation between the CEAS and the Air and Space Academy was concluded in the form of an official Memorandum of Understanding (MOU); (iii) Accounting 2013 report's approval and 2014 budget's adoption.

Besides, many items were deeply discussed all over the meeting, most notably: the status report of the Aeronautics and Space Branches, the role of CEAS within the E'CAERO Project, the possible ways in view of a better cooperation with EUCASS, the presence of CEAS within ACARE, the CEAS Journals' development, the preparation of the forthcoming CEAS technical events, the cooperation of CEAS with the European Association for Aeronautics Students EUROAVIA.

CEAS ANNUAL REPORT FOR 2013

By David Marshall, CEAS President from January 2012 to January 2014



CEAS has continued to develop its activities in 2013 under the four key themes identified over 2 years ago in a strategy review.

These were:

- Knowledge dissemination
- European links
- International relationships
- Education and young people

For Knowledge dissemination we had a successful and enjoyable biennial European Conference superbly organised and hosted by the Swedish Society of Aeronautics and Astronautics at Linköping for which we must record our most sincere thanks and congratulations. As noted below we may be able to move towards a situation where there is only one such Europe wide event in any year to the benefit of both our aerospace community and those who take the risk of organising such events.

Another part of our dissemination agenda are a growing series of 'Specialised Conferences' which are all becoming fixtures of importance to all who work in these fields. I was fortunate to be able to attend two of these:

Guidance Navigation and Control (EuroGNC) held at TU-Delft and Aeroacoustics in Berlin. In addition the International Forum on Aeroelasticity and Structural Dynamics was held in Bristol in June and the European Rotorcraft Forum was held in Moscow in September. A new technical committee was also launched at Linköping on aircraft

design at the third symposium held on this topic in order to help promote this specialisation and support future events under the banner of CEAS.

Our Aeronautical and Space Journals increased their rates of publication over 2013 to create seven issues between them. Besides maintaining this momentum, the task is now to achieve improved impact factors for papers that are published as the essential incentive for authors to offer their work. Another future challenge will be to satisfy the growing demand for open and free publication while keeping a viable business model.

Our own Bulletin continued to deliver a very high quality quarterly product which has become one of our major tools to demonstrate the value of CEAS. I want to congratulate and thank its Editor Jean-Pierre Sanfourche for continuing to make this possible.

Another tool for dissemination which has now become a major asset across our sector is the Conference Programming Management Information System (CPMIS) jointly supported with the AeroSpace and Defence industries association in Europe (ASD). Uploading new events onto it has been streamlined and already a full calendar is evident for 2014 showing that it is widely used and recognised.

Our European links have been developed in 2013 particularly with European Commission Research planning and the conclusion of the E-CAERO contract. We joined the ACARE activity in the run up to the Horizon 2020 research agenda to be launched in 2014. I participated as a member of the Working Group that reviewed Infrastructure and Education which with the other four groups will now continue to monitor and to advise as the programme is rolled out in the coming years. It is clearly open to us to participate in the other groups where we have something to contribute.

The E-CAERO contract ended this year and I must first record our gratitude to all in our community who have helped us fulfil our part of it. Particularly to Willy Kordulla and

others at the DGLR who managed our participation and to Pierre Bescond who took a particular interest and part in seeking a positive outcome for CEAS from this effort. The overarching goal of the Commission for a single voice in Europe in respect of both conference organisation and paper publication remains and a new call to build on the E-CAERO effort is now open. It will be an early task in 2014 for us to decide whether and how we might participate. However the previous programme has encouraged links to other organisations which can be developed whether or not as part of a newly funded contract. The real prize would appear to be a way forward with EUCASS which if found, would meet a major part of the Commission goal. An initial meeting appears to hold promise and can also be built on in 2014. Our link to ESA remains strong thanks to the efforts of Constantinos Stavriniadis and this is evident in both the strong space programmes injected into our Biennial conferences and the Space Journal. A goal in 2014 should be to make links to other European level organisations such as EASA, EUROCONTROL and the EDA.

International relationships were not taken forward in 2013 but it could be a task for 2014 to revisit the most critical of these, that with the AIAA, to see what concrete goals could be agreed while at the same time reviewing current arrangements that might need changing.

A new relationship is planned for ratification at the start of 2014, an agreement to work with the Academy of Air and Space based in Toulouse.

The main thrust of this proposal is to bolster joint efforts at European issues by joint work and promotion in Brussels. Another strand to be worked is joint effort on the issues of young people and education.

Education and Young people has been given significant attention by both the efforts of the EUROAVIA President, Jacqueline Chindea, as a Trustee of CEAS and the dedication of an Education day at the Linköping conference. The outcome from this effort was a plea to CEAS to take a lead in the critical areas identified during this day, this included establishment of a special interest group looking at Education and Skills under the CEAS banner. The issues will be discussed at the first Trustees meeting in 2014.

We continued to honour individuals adjudged to have made a special contribution to European Aerospace with our Gold Medal. In March we recognised Professor Dr Manfred Fuchs at a ceremony in Brussels and on 17 January in Paris, I had the great honour to present this Award to Mr Louis Gallois at a ceremony hosted by the 3AF.

In final remarks on 2013 I must record very sincere thanks to Mercedes Oliver and her employer, Airbus Military, for her outstanding work as Director General and the support she has given me.

Sadly we will be saying "au revoir" to François Gayet who is stepping down as a Trustee for the 3AF. François has made a real contribution during his tenure and hopefully he can still be called on for advice.

I also want to thank all of the other Trustees for their support of me during this year and express sadness that events beyond my control are leading me to have to step down from the Board of Trustees. I have both greatly enjoyed the experience and continue to want to see CEAS prosper as the Voice across Europe of the Aerospace Learned Societies.

*David Marshall – CEAS President
January 2014*

PRESENTATION OF THE CEAS GOLD MEDAL AWARD TO MR LOUIS GALLOIS BY CEAS PRESIDENT DAVID MARSHALL



From left to right: CEAS President David Marshall, Mr Louis Gallois holding his Gold Medal, 3AF President Michel Scheller, Anne Venables, Secretary General of the 3AF. In the bottom, between Mr Louis Gallois and Michel Scheller, is Mr Patrice de Langsdorff.

On 16 January 2014 in Paris, Mr Louis Gallois, former EADS Chief Executive and present General Commissioner to Investment in France, received from the hands of CEAS President David Marshall the Gold Medal Award of the Council of European Aerospace Societies. This ceremony, hosted by the Association Aéronautique et Astronautique de France (3AF), took place at Hotel Kergorlay Langsdorff, Paris 16^{ème}.

The speeches successively pronounced by 3AF President Michel Scheller, CEAS President David Marshall and Mr Louis Gallois are here below reproduced.

The welcome speech delivered by 3AF President, Michel Scheller:

“ Bonjour à tous,
3AF, et bien entendu son Président, sont heureux de vous accueillir ici, ce soir, à l’occasion de la réception donnée en l’honneur de notre Commissaire National à l’Investissement Louis Gallois.

Monsieur le Président du Board du CEAS, cher membre d’honneur de 3AF, cher David Marshall, laissez moi, avant

que je ne vous cède la parole, vous expliciter les raisons pour lesquelles 3AF est sensible à recevoir ce soir le Board du CEAS – 3AF s’est impliquée avec vigueur dans la mise en place du Council, CEAS (elle en a été une cheville ouvrière pertinente), démarche européenne s’il en est une, et les difficultés nombreuses rencontrées, ont été surmontées, dépassées ; mon cher David, vous présidez aujourd’hui une « organisation » européenne performante, reconnue.

Monsieur le Commissaire, Cher Louis Gallois, Cher membre d’honneur de 3AF, autorisez-moi quelques mots.

Nous nous sommes rencontrés en 1988. Cela me laisse évidemment quelques images.

Première image : le choix difficile du radar de l’Avion Rafale – vous avez su éteindre, par le dialogue, les passions et décider de la solution qui était la meilleure.

Puis, je dois dire, vous m’avez toujours manifesté amitié et patience en m’écoutant et en me prodiguant vos conseils – vos recommandations.

Une autre image forte, je vais en dire le pourquoi. Vous quittez la présidence de la SNCF – vous portez les atours du cheminot – et une standing ovation, marque, avec beaucoup d’émotion, votre départ.

Pour moi, et vous le démontrez tous les jours, vous êtes ce grand serviteur qui sait que la sagesse relève, entre autres, de la communication, des échanges, des explications, entre individus (je me méfie personnellement de cet usage intensif des SMS) et dans l’entreprise, créatrice de valeur, ceci est plus important que tout le reste – si vous me permettez, j’aime employer l’expression de « Société Citoyenne ».

Je ne rapporterai pas l’anecdote relative aux fondations d’EADS, récemment citée par mon ami, ici présent, Jean Botti. Mais, avec beaucoup de modestie, je pense, cher Louis Gallois, être un de vos disciples – et pour terminer, vous m’avez toujours encouragé lorsque j’évoquais avec vous 3AF. Je pense profondément qu’une Société Savante est un lieu d’épanouissement individuel, avec retombées au profit de la collectivité – et en particulier au profit de la Société d’appartenance (industrielle ou entité de recherches, ou entité d’enseignements).

Vraiment, très intimement, je souhaite la réussite du plan stratégique mis en œuvre à 3AF car j’ai la conviction que c’est une manière efficace de contribuer à la création de richesses dans la sérénité et pour le bien de tous. J’ai été un peu long, cher Louis Gallois – l’occasion était belle – et puis l’on se connaît depuis si longtemps... J’ai été le témoin des premiers pas de la Fabrique.

Je cède à présent la parole au Président David Marshall, en vous disant que nous sommes très honorés de vous avoir accueilli et d’être à vos côtés ce soir. ”

The speech delivered by CEAS President David Marshall:

“Ladies and Gentlemen, Good evening
As current President of CEAS can I add my welcome to that of Michel Scheller to all of you invited here tonight to honor and witness this presentation.

Most of you will already know that CEAS is the Council of European Aerospace Societies bringing together the principal learned societies from across Europe to help advance the cause of aerospace at the European level.

One of the early decisions taken by those who founded CEAS was to identify individuals who had made a seminal contribution to European aerospace and recognize their achievements by presentation of a Gold Medal.

Tonight we are doing this to someone whom I am sure needs little introduction to any of you.

A substantial part of Louis Gallois’ career has been as a leader in the major aerospace industries of France and Europe. My own first contact with him was as the Chief Executive of SNECMA and subsequently Aerospatiale. He had of course arrived in these positions after senior positions in various government Ministries and the cabinets of senior Ministers. It was then quite a shock to those of us outside France to then find that he had taken on the very tough role of leading French railways, the SNCF. But it was always hoped that we would not lose his talents and this proved true when he came back to us at EADS.

There is a pattern to these moves in that certainly in the case of SNCF and EADS he was answering a call to lead enterprises with clear problems. In a typical comment to a British newspaper he said that he had simply been lucky rather than the best! I would say that we have been the lucky ones to have had the benefit of his leadership. It seems clear from his current work for the French Government that his talents are still needed in these difficult times.

At the European level this was most obvious in the way he led EADS and particularly Airbus at the time when it had major problems with both the A380 and A400M not to mention the instability coming from the mixture of private and public shareholders. He can surely take credit from guiding the whole enterprise into the pre-eminent world position it now holds making it THE shining example of what can be achieved at the European level.

There can surely be no doubt that he is a most worthy recipient of our Gold Medal and I take the pleasure in presenting it to him. ”

The speech delivered by Mr Louis Gallois:

“Dear Presidents, dear colleagues,
I want first to thank you very much for such an award. I am extremely honored. For me, it means that I am still part of the aeronautic and space family. I have to tell you my pleasure to be among my peers because I am a member of the French Academy. But I want also to apologize not to have been able to attend your September meeting in Linköping. I discovered that I was a too busy retired people.

Aeronautics and Space are not a business as another. It is much more than that: it is history, it is passion. We are at the forefront of science; it is one of the most exciting adventures in our modern world! I take this opportunity to talk before you

about one topic, I saw emerging during my 20 years around aeronautics: environment protection.

What is the future of our industry? Two sets of figures show where our biggest challenge is:

- in 2010-number of passengers: 2,7 billions
- in 2030-it means to-morrow morning : 6 billions
- in 2013- number of airplanes: 24 000
- in 2030- number of airplanes: 45 000

In the same time, we know that aviation industry accounts for about 2% of the total man-made CO₂ emissions – and this percentage should not increase when the traffic is doubling if we want to get acceptance by public opinions. We see the magnitude of the challenge.

The first way is certainly to increase the efficiency of engines: with 2030 as a target year, the most promising solution, probably, is the very high dilution without containment, if we are able to manage noise and safety. I add that it will interfere with the airplane design.

The second avenue is to make aircraft lighter through either CFRP or new aluminum alloys. The new A 350 is 53% composites, the same percentage as the 787. You know that it is not an easy game. Machining is complex. Protection against lightning and more globally electricity distributions are a nightmare, in particular with higher voltage.

The third field is aerodynamic, load management on the wings and variable profile, which allows reducing drags. I am sure we are not at the end of the game regarding this topic. I only mention winglets: they are adding efficiency reducing the negative impact of turbulences. It is a mystery for me that we needed 40 years of modern commercial airplanes to discover that and implement winglets.

But engines and airplanes are not the only levers to reduce fuel consumption and CO₂ emissions. The air traffic control through software improvement and more automatic flight

management could significantly reduce CO₂ emissions. Electrical taxiing on airports is targeting the same objective. In a nutshell, limiting aviation CO₂ emissions will be the common task of the whole industry: airplane and engines manufacturers, airports, airlines, air traffic authorities. It will need a lot of technical and managerial innovations making our industry different, much more focused on environmental challenges and much more open to cooperation. It is certainly a condition for the needed increase of traffic which has to be accepted by our public opinions.

I have not talked about space. I want only to express a conviction before you. Space adventure will be the adventure of the XXIst century. Europe cannot afford not to be part of it. We cannot leave the US, Russia, China, Japan or India to explore space on behalf of the first world economic area, Europe, and to have us in the back seat. I love history; in the 15th century there was a man of vision, king of Portugal, Ferdinand the navigator. He supported the exploration of African coast up to India. He made the Portuguese fortune. We need a European Ferdinand the navigator, able to engage Europe into space exploration.

It is clear in my mind that to face this challenge in an industry which is one of the most advanced one, technically speaking, we need the best engineers, the best technicians, the best workers; for that, Aeronautics and Space must remain attractive and you know that, in Europe, it is more and more difficult to attract the best people into industry. That is another challenge: to convince talented young people that nothing is more interesting and rewarding than to work in aeronautic and space industry.

Thank you very much to give me the opportunity once again to think and talk about this fantastic industry. And thank you very much to award me the CEAS gold medal- I feel extremely proud and honoured.”




ABOUT E-CAERO

The day before the CEAS Board of Trustees Meeting, on 16 January, took place at ESA a working session dedicated to E-CAERO in which the CEAS intends to play an important role. We publish herein the presentation given by Rémy Dénos, DG Research & Innovation at the European Commission.



Where are we today ?



To better understand the situation,
you should step outside of your organisation for a moment
and take the point of view of an 'individual'
'Customer' or 'Provider' of Scientific and/or Technical Knowledge

Fig. 1

Customer / Provider: Academia



- I am a **EU** based researcher in aerodynamics
- I am looking for a scientific conference to present my results and meet my peers
- Contacts with industry would be welcome
- I also want to publish my result in a journal with a good impact factor
- I need to be able to search and access articles quickly for references

Fig. 2

Customer/Provider: Research Centers



- I am a researcher in combustion for aeroengines
- I need access to the latest scientific developments and I support industry in introducing these into modern design tools
- Where can I find these developments ?
- In which event can I show the results of our applied research work ?
- Where can I publish my result ?

Fig. 3

Customer / Provider: Industry

→ I am an engineer in charge of making available fast design methods for the company

→ I have little time for external activities and I need to find a place where I can quickly make my mind on a wide range of the many methods available.

→ I would like to access the most recent scientific / technical articles from my computer

Fig. 4

Customer / Provider: Research Policy Maker

→ I am in charge of defining research programmes / research strategy

→ I need to have a broad overview on the state of the art of research, to analyse trends / needs

→ I want to meet organisation providing funding for research

→ I want to have access to the views of high level decision makers

→ Where can I find this information ?

Fig. 5

Often, the answer is

AIAA
The World's Forum for Aerospace Leadership

ASME
SETTING THE STANDARD

or

- Conference organisers
- Course providers
- Journal publishers
- Database / repository
- Web site
- Commercial services

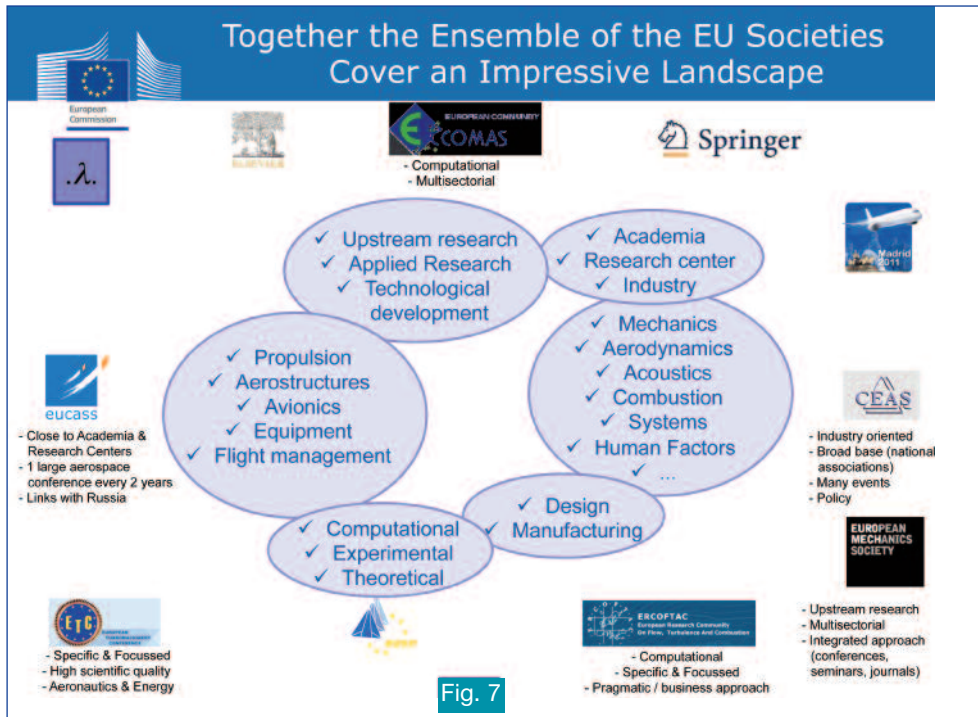
ASME has grown through the decades to include more than 130,000 members in 158 countries. Thirty-thousand of these members are students.

Conferences : June 2014

- 33rd International Conference on Ocean, Offshore and Arctic Engineering (OMAE) Jun 08 2014 - Jun 13 2014 | San Francisco, California, United States
- ASME 2014 Manufacturing Science and Engineering Conference Jun 09 2014 07:30 AM - Jun 13 2014 05:30 PM
- ASME 2014 Conference on Information Storage and Processing Systems Jun 16 2014 - Jun 17 2014 | Santa Clara, California, United States
- 11th AIAA/ASME Joint Thermophysics and Heat Transfer Conference Jun 16 2014 07:30 AM - Jun 20 2014 05:30 PM | Atlanta, Georgia, United States
- ASME Turbo Expo 2014 Jun 16 2014 - Jun 20 2014 | Dusseldorf, Germany
- 2014 NRC/ASME Pump and Valve Symposium (Expand Sub Events) Jun 22 2014 01:00 PM - Jun 27 2014 06:00 PM | North Bethesda, Maryland, United States
- ASME 2014 8th International Conference on Energy Sustainability, and 12th Fuel Cell and Technology Conference Jun 30 2014 - Jul 02 2014 | Boston, Massachusetts, United States

1/3 of worldwide scientific knowledge is produced in Europe

Fig. 6



Harmonizing the Calendar of Events

Putting together a yearly calendar of events would allow better timing, avoid overlap and undersubscription

Events could be organised jointly when this makes more impact

2013

- EUROGEN 2013**
10/7/2013 12:00:00 AM, Las Palmas de Gran Canaria, Spain
- CEAS2013 - Innovative Europe**
9/16/2013 12:00:00 AM, Linköping, Sweden
- EMMC13 - 13th European Mechanics of Materials Conference**
9/8/2013 12:00:00 AM, Warsaw, Poland
- EUCASS 2013**
7/1/2013 12:00:00 AM, Munich, Germany
- Joint EUROMECH Colloquium [547] Trends in Open Shear Flow Instability**
7/1/2013 12:00:00 AM, Ecole Polytechnique, Palaiseau, France
- Joint EUROMECH Colloquium [541] New Advances in the Nonlinear Dynamics and Control of Composites for Smart Engineering Design**
6/3/2013 12:00:00 AM, Senigallia, Italy
- ADMOS 2013**
6/3/2013 12:00:00 AM, Lisbon, Portugal
- ETC10 European Turbomachinery Conference**
4/15/2013 12:00:00 AM, Lappeenranta, Finland
- ATW Fundamentals of Aerodynamic Flow and Combustion Control by Plasmas**
4/7/2013 12:00:00 AM, Paul Langevin CNRS Conference Center, Aussois, France
- Euro GNC 2013 - 2nd CEAS Specialist Conference on Guidance, Navigation & Control**
4/10/2013 12:00:00 AM, Delft, The Netherlands

Fig. 8


Harmonizing the Formats / develop a shared identity

- Agreeing on a minimum standard for papers (including using metadata for e-search)
- Developing a shared identity (e.g. systematic use of the logo of the society + of the shared identity)
- Easier to archive, search disseminate
- More transparent for customers/providers

Fig. 9

Developing a common e-Platform and services

- ✓ Young researchers are making intensive use of e-tools, paper proceedings will progressively disappear
- ✓ Conference registration, review process, dissemination can be handled electronically
- ✓ e-means offer new possibilities
- ✓ Conference organising is a job in itself for which scientists may not be well qualified




- A common e-platform will ease accessibility to papers / communications / proceedings (in particular if common standards are adopted) + guarantee perennality
- Savings will result if all societies contribute to the development and use the same tools
- Together, societies could afford more professional services
- The e-platform could advertise the common calendar of events

Fig. 10

Promoting jointly

- ✓ a set of Journals
- ✓ the different prizes of the different societies
- ✓ societies bulletins

would



- enhance impact factor
- raise visibility and prestige
- allow to reach a wider audience

Fig. 11

Working together, the societies would:



- Serve better the Scientific/ Technical community in Europe
- Gain visibility
- Gain impact
- Gain influence on the European and International policy scene

Fig. 12

Initiatives should

- † Pursue the goals of serving the scientific /technical community
- † Identify synergies
- † Valorise / Exploit the strong points of all societies
- † Harmonise the calendar of events
- † Develop common resources, mutualise costs
- † Professionalise services
- † Develop a shared identity
- † Increase impact of communications and journals

Fig. 13

Aerodays 2015

19-22 October 2015

COOPERATION AGREEMENT BETWEEN THE ACADEMIE DE L'AIR ET DE L'ESPACE/AIR AND SPACE ACADEMY AND THE COUNCIL OF EUROPEAN AEROSPACE SOCIETIES (CEAS)



1. Background:

The “Académie Nationale de l’Air et de l’Espace” (ANAE) was founded in 1983 in the French national context. In 2006, the members of the Academy decided to transform it gradually into a European-wide Academy, with all its European members having the same status¹. Consequently, as of 1 January 2007, the Academy became “Académie de l’Air et de l’Espace” (AAE) and its English language version became “Air and Space Academy”.

The regular annual election process, which was not modified, allows for an increasing number of individuals from European countries other than France becoming full members or correspondents of the Academy, reaching a total of 82² at the end of 2012 out of a grand total of 342³.

During the last 5 years, the Académie de l’Air et de l’Espace/Air and Space Academy has developed in a consistent manner its activities at the European level, in particular in Brussels with the European Commission (DG Enterprise, DG Move, DG Research), the European Defence Agency (EDA), the European Parliament, but also the European Aviation Safety Agency (EASA) in Cologne, and the European Space Agency (ESA) in Paris.

In parallel, the Academy has established a tradition of holding one full session every year in a European country, namely The Netherlands (Noordwijk) in 2007, Italy (Rome) in 2008, Spain (Madrid) in 2009, Germany (Munich) in 2010, the United Kingdom (London) in 2011 and Sweden (Linköping and Kiruna) in 2012, which were good opportunities for the Academy to establish links with the local aerospace societies.

Meanwhile, these same aerospace societies and all of those established across Europe took the initiative of establishing a joint organization, the Council of European Aerospace Societies (CEAS), based in Brussels, which organizes joint activities and events, in particular holds a

European wide Conference every odd year, Berlin in 2007, Manchester in 2009, Venice in 2011 and Linköping (Sweden) in 2013. It also supports subgroups such as aeroacoustics and rotorcraft which deliver Europe wide specialist conferences and publishes a quarterly Bulletin focusing on European aerospace news and issues.

2. Cooperation definition:

Due to the similarity, and sometimes complementary nature of the two entities expertise and view it appears that there would be many advantages to establish a structured cooperation between the Académie de l’Air et de l’Espace/Air and Space Academy and the CEAS to the benefit of the European aerospace activities. Such cooperation is defined as follows:

2.1 Publishing common position papers: Exchange of views on issues of direct interest to the aerospace community in Europe, with the intent of preparing “position papers” addressed to the European Countries the decision makers and at the European Union level.

2.2 Issuance of extensive reports: The Académie de l’Air et de l’Espace / Air and Space Academy includes dedicated commissions which focus on certain areas of the air and space activities such as the “Defence” commission, the “Civil Aeronautics” commission, the “Space” commission, the “Education” commission, the “European development” commission, etc. These commissions, which are open to non members of the Academy, produce either short position papers –“opinions”- or more extensive reports -dossiers- analysing the situation in certain areas and containing appropriate recommendations. It makes sense to discuss with the CEAS or, via the CEAS, with CEAS members societies, which areas require such focused analysis and how to set up a joint working party to tackle them.

1. In this context “European members” mean any member who is a citizen of a European Union country plus Switzerland and Norway.

2. 27 full members (“membres titulaires”), 24 emeritus members (members who have passed the 75 years old limit), 27 correspondents and 4 honorary members (“membres d’Honneur”).

3. This proportion of about 25 % will continue to increase year by year at the rate allowed by the relatively small number of seats vacated every year by full members (“membres titulaires”) who pass the 75 years old limit for full membership.

2.3 Joint participation to international conferences:

Each entity is periodically organising international conferences. On topics felt critical by both the Academy and the CEAS the intent is for the organising party to invite the other one to participate to such conferences.

For example, initiate joint work on a theme of known concern at a European level to lead to a workshop around the topic to be held during the CEAS 2015 Conference. The Academy will propose a similar contribution for one of its conference in the period 2014-2016.

2.4 Collaboration in the series of public talks: On current issues of Aviation and Space the Academy organises public talks since 2010 in Brussels at the rate of 3 per year. It would make sense for the Academy and CEAS to join forces and implement a more ambitious schedule for such talks, possibly at the rate of one every two months or so. Also, a coordinated communication plan would improve the attendance at such talks.

(A joint event in Brussels in 2014 as one of the three per year currently planned by the Academy. An agreed topic addressed by a speaker from each organisation.)

2.5 Create a joint Education and Skills activity : As specific attention is paid to the selection and the education of the best possible Aerospace engineers in Europe common initiatives can be taken to communicate to the European youth and the education system in order to improve their understanding of the variety and benefits of the related professions.

2.6 Ensure that the websites of both organisations have prominent links to the partner that highlight important publications and events.

2.7 CEAS could also play a role in suggesting new candidates for election to the Académie de l'Air et de l'Espace/Air and Space Academy, thus contributing to the high level of quality of its membership. As new candidates are discussed every year in restricted meetings of the 5 sections of the Academy, such suggestions will have to be channelled through individuals who are full members of the Academy. To be noted that the proposed candidates will have to commit on their involvement to the Academie activities as well to their basic Association ones.

3. Implementation management:

In order to ensure a proper implementation of this cooperation the relationship should be structured in such a way as to keep open various modes of collaboration in a flexible manner. Typically two meetings a year will be organised: one during the CEAS board inviting an Academy representation and one during the Academy "bureau" inviting a CEAS representation. These meetings will cover reviews of subject selection, decided work progress and mode of operation.

Signed on 17 January 2014 in Paris:

The Académie de l'Air et de l'Espace President:
Philippe Couillard

The CEAS President:
David Marshall

AERONAUTICS BRANCH STATUS REPORT

by Christophe Hermans (branch chair) January 2014

COUNCIL OF EUROPEAN AEROSPACE SOCIÉTIES
CEAS

Aeroacoustics TC

- 17th workshop 'Atmospheric and ground effects on aircraft noise', Sevilla (Sp), 24-25/09/13
 - 60 participants, 20 papers
- 20th AIAA/CEAS AAC 2014: Atlanta (USA) as part of "AIAA Aviation 2014", 16-20/06/14
- Point of attention
 - Rename CEAS Award for Aeroacoustics **in Europe** (distinguish between AIAA award)
 - Yearly student award

Fig. 1

COUNCIL OF EUROPEAN AEROSPACE SOCIÉTIES
CEAS

ERF
European Rotorcraft Forum

Rotorcraft TC

- European Rotorcraft Forum ERF 40: 2 - 5 September, 2014 in Southampton (UK) – birthplace of ERF in 1975
 - Call for papers launched



Fig. 2

COUNCIL OF EUROPEAN AEROSPACE SOCIÉTIES
CEAS

Aeroelasticity & Structural dynamics TC

- IFASD 2015: St Petersburg (R), IFASD 2017: Como (I)
- Point of attention
 - publication in CEAS Journal

Fig. 3

COUNCIL OF EUROPEAN AEROSPACE SOCIÉTIES
CEAS


Guidance, Navigation and Control TC

- TC has 35 members (4 'international')
- Organization of 3rd EuroGNC conference at Toulouse in 2015 has started (<http://w3.onera.fr/eurognc2015/content/home>)
- Harmonization between Aeronautics and Space Branch GNC activities
- Draft ToR exists
- Discussion on cooperation with EUCASS has started

Fig. 4

COUNCIL OF EUROPEAN AEROSPACE SOCIÉTIES
CEAS

Aircraft design TC



- ToR & web pages (in progress)
- Education section (EWADE: European Workshop on Aircraft Design Education) will organize bi-annual meetings (late summer 2015: TuDelft)
- Research section (SCAD: Symposium on Collaboration in Aircraft Design) will hold annual meetings (late 2014: Airbus Toulouse)

Fig. 5

COUNCIL OF EUROPEAN AEROSPACE SOCIÉTIES
CEAS

Future activities

- Establish LinkedIn groups for all TCs
- Update website (dedicated pages for TCs)
- How to proceed with networks?
 - Draft ToR for networks
 - Find PoC for networks 'Avionics' & 'Structural design'

Fig. 6

COUNCIL OF EUROPEAN AEROSPACE SOCIÉTIES
CEAS

Open issues

- 03.11
 - Difficulty in getting papers published in CEAS Journal (ISBN # assigned to conference papers published by national society cannot be published in CEAS Journal)
 - Make available CEAS conference papers on CEAS website
- 10.11
 - Apply for Scopus & ISI indexing of CEAS conferences & journals
- 06.13
 - Level of AIAA involvement in European specialists conferences
 - How to better advertise conferences?

Fig. 7

WORLD AEROSPACE FORUM

By Thomas P. Vermin,
President EUROAVIA Delft



“If there is any lesson to be learned from history, it is that history repeats itself.”

Whether it was when the telephone was invented or when the first plane took flight, the inventors were always met with great skepticism. Its potential seemed unsure, its application unknown, and contemporaries quick to laud it ‘a temporary fad’. How wrong they were. In the easy light of hindsight, all the biggest inventions of the last century had in common that they made the world smaller. Whether it was a military invention like the A-bomb or a commercial invention such as the television, they all brought both fear and hope closer to home.

And so, at the end of the 20th century the last of these globalizing inventions came on the scene. The internet took away all the barriers to information. It took decades of experiments, successes and failures to reach its current state with all its endless applications. But the oncoming of the internet and its vast information highways also holds a mirror to us.

Because with all the information that is now at our fingertips, we realize that there is even a greater amount that we’ll never get to know: perhaps because we’ll never search for it, perhaps because it will only be present in a fleeting moment. The question is how much of the missed information could help us, in other words, how much are we missing out, and how much the industry is missing out by not reaching the right person?

In an earlier time, these market inefficiencies were hard to overcome. Whether it was because of geographical or cultural boundaries, the disconnect between local industries

meant an unbridgeable gap between demand and supply. In the connected world of today, these old excuses no longer apply. The barriers that kept us from finding the right collaboration, the right talent, the right opportunity, are no longer in place. The only things that are missing are the right tools to curate and disseminate the right knowledge to the right person.

It is my belief that the World Aerospace Forum will be a first step in that direction: perhaps initially more of a statement than a fully functioning network, but in the long run an example for other industries and ideas to come. The similarity with the name of ‘World Economic Forum’ does not end at name alone, for it too has the intention to draw thought leaders to collaborate on a global issues within the framework of a not for profit institution.

However, in means of achieving this goal, the World Aerospace Forum differs greatly. The Forum intends to solely exist online and in order of achieving its goal of ‘boundary less collaboration’ it should eliminate itself as much as possible from the process. Like the mobile devices have evolved to be a natural extension of ourselves, so should the Forum become a natural integration in our professional lives.

Perhaps it all turns out to be too much idealistic, perhaps it will fall short of its goals. But maybe this is the incremental push that guides us in the right direction and makes the aerospace world a smaller place. That makes it all the worthwhile.



ABOUT CLEAN SKY



ON 21 NOVEMBER 2013, TOOK PLACE IN BRUSSELS THE CLEAN SKY 2 GENERAL INFORMATION DAY

The speech delivered by Eric Dautriat, Executive Director of Clean Sky JU

“Ladies and gentlemen, dear colleagues, dear friends, I’m really impressed by this very wide participation. This confirms the high level of interest raised by CS2 throughout Europe, and beyond. It is a matter of fact that I don’t know any participant in CS today who voiced an absence of interest for CS2, and conversely I met quite a lot of non-participants in CS who are eager to become part of its continuation. This is good news, because we will need many skills, on a wide basis, a wider basis, to reach the expected CS2 objectives.

On the 10th of July, President Barroso released the Innovation Investment Package proposal of the European Commission, for a total of 20 B€. This is all about PPPs, meaning either public-private partnerships or public-public partnerships. (Private-private are not included so far...). Clean Sky continuation, called Clean Sky 2, is part of this package, the largest one in terms of total budget: 4 B€ officially, when you put together the “pure” Clean Sky 2 draft programme and “additional activities” committed by the Founding Members, which will be funded out of H2020 but will contribute to reaching CS2 objectives. This impressive amount is supported by a not less impressive public funding of 1.8 B€.

This proposal from the Commission, which takes the form of a proposed Regulation, like for CS¹, is built against a Joint Technical Proposal, put together by the Founding Fathers, Founding Members, alias the Leaders, and officially forwarded to the Commission on the occasion of the last Paris Air Show.

I’m quite optimistic about the political support to CS2, be it in the Council or the Parliament. There are, or have been, discussions on the budget or some other “legal” issues, but nothing questioning the principle of a JTI continuation, at all. This is due, I believe, to five main reasons:

- **First**, CS has a good image; it has the reputation of being on its way of achieving most of its objectives, which I can confirm; we just received the final report of the Second Interim Assessment, worked out by a Panel of experts appointed by the Commission, who scrutinized the CSJU for weeks if not months, and came to highly positive conclusions. There are many participants in CS “1” here, this appraisal is theirs.

- **Second**, Clean Sky attracted many participants: we should be in the range of 600 after the last, upcoming Call, with a high rate of SMEs, Academia and Research Organisations, in particular in the share open to competition, but not only; now we are far from the received idea of

a closed club mainly benefitting to a handful of big players. The appropriateness of what we call the “mono-beneficiary application” has now been fully recognized by all parties, including the Parliament, as a well-justified derogation; this should no longer be a show-stopper for the call to come;

- **Third**, the CS2 set-up shows even more openness, through a 40/30/30 funding distribution (40 for leaders, 30 for Core Partners, 30 for Partners), meaning 60% open to competition, open to non-leaders industrial companies, SMEs, and the research community;

- **Fourth** reason, CS2 proposal strikes a balance between a higher level of integration through ambitious in-flight demonstrators at the horizon 2020, AND more far-reaching research, paving the way for the longer-term objectives included in the last SRIA of ACARE: this leaves room for the full innovation chain being represented in CS2 and being fed by it.

- **The last reason** why I’m optimistic about the political support is that CS2 has a wider agenda than CS. While keeping the environmental objectives quite high in this agenda, with a new set of targets beyond the expected achievements of CS, it also addresses, quite explicitly, competitiveness, in order to keep and improve the European leadership. CS2 is the best model the European Union may support for bringing innovation and through it, jobs.

We are still in a quite preliminary phase, the political phase, so to say. The Regulation is being negotiated in the Research Working Group of the Council. We have rather good news from this side but no final position from the COREPER yet. It is also discussed in the ITRE committee of the European Parliament, the opinion of which will be brought to the Council before a final decision. The Rules for Participation have not yet been finalized, despite constructive discussions we are having with the Commission, the NSRG¹ and the Leaders.

We expect now a final decision by March next year. A bit later than expected. And beyond that, another couple of months could be needed for some further legal decisions. Moreover, we had already admitted not to start any call before this adoption of the legal basis. This will delay the operational start, with respect to our initial expectations.

So... we could have quietly waited for the final adoption of the Regulation, the final adoption of the rules for participation... put everything in series... but we had rather releasing some information today and listening to you. I wish to stress that all what we will say today is provisional and not comprehensive. I’m sure that several questions you will raise will remain unanswered, and for this I apologize in advance. Please don’t blame Sébastien, Bruno or Ron for this. Don’t blame me neither...

I think I don’t need to remind you of the general principles of CS – you are all aware of the basics. You know, for instance, that we have a first row of participants, which are

1. National States Representative Group.

the Founding Fathers, OEMs, global competing leaders in their category for airframes, engines, equipments; these leaders have put together, with the JU support, a technical proposal which is and will be the basis of a first call for “Core partners”, the second category of participants, strategic partners close to the definition of Associates in CS1; then we have, like in CS today, the “partners” applying to specific topics for a limited duration.

Despite the political delay, we are approaching the crucial building up of the teams which will run the ITDs and IADPs in the future, around the leaders. Of course we will have a dedicated presentation on how we see this today. I wish to mention two concerns we have, for a balanced and comprehensive approach:

- On one side, we intend to welcome in this programme, not only the execution of Work Packages as defined by the Leaders, but also innovative inputs from the candidate Core Partners, enriching or complementing the current proposal; it is absolutely clear that Core Partners are part of the final definition, final update of the full programme;
- On the other side, it should not be forgotten, and I will not, that at least for the most integrated, in-flight or also on-ground demonstrators, the efficiency of this research requests highly committed core partners, well trained to some operational constraints, responsive, able to deliver on time, able to cope with the constraints of permit to fly. In this respect I’m sure that the lessons learnt from CS1 will be taken on board for an optimal interaction. I just wish to quote a recommendation from the recent Interim Assessment Panel: *It is recommended to secure robust commitment from the participants to find ways to prevent a lack of attention and of focus from the participating companies and to secure adequate resource allocation by all.*

What is for sure - with a budget which should be more than twice the CS1 budget, we need to strengthen and widen the basis of partnerships. The competition and the independent evaluations will tell. But I wish that we continue, stabilize and strengthen the links created through CS with a lot of associates and partners, at least the well-performing ones, a vast majority of course... maybe... as you know, we have 50% of newcomers in European research among our CfP partners... So, stabilize... But I also wish that we are able to take on board more newcomers, from new horizons, which will help the aeronautical sector to take the best of innovation.

Please have in mind that we need to carefully phase-in CS2, even before CS1 is being phased-out. It will not be a big bang but a transition. There is a 3-years period of overlap between the two programmes, which is quite classical between two multi-annual programmes, and manageable, but we will have to implement a progressive start, with not all projects started at the same time. We need to carefully

take the state of play of Clean Sky projects into account. We also need to learn lessons from the initial and difficult ramp-up of CS1, and make sure that everything (almost everything!) is ready before starting a project, be it a demonstrator or what we call a technology stream. Sometimes a preliminary phase could be necessary, an advanced project by the leaders, before being able to open the appropriate calls.

This means that the involvement of Partners, be they Core or not core, will also be phased accordingly. Take this into account in your strategy: after the first call, there will be a second and probably a third. Not 16 like CS1 CfPs. But a few. And don’t forget also to weight the participation as Partner (in the classical CS1 sense) against the participation as Core Partner. You will learn more about all this through the JU presentation today.

So, before the actual competition when the Call is open, we have some months available during which we will allow for, or better: *encourage* technical discussions between any potential applicant and the Leaders. We will decentralize this, through many further Info Days: this one is a kind of kick-off info day. You will have time for networking this afternoon, but the dedicated organized interactions will take place in the coming weeks and months. The purpose of these workshops, or face-to-face meetings with leaders, is not any kind of pre-competition but exchanges of views, on both sides, for the Core Partners to be prepared to what the Leaders will be mostly interested in (what content, but also what skills and background) and for the Leaders to possibly enhance their technical content with other suggestions. I do encourage you to go through this interaction, which is a kind of follow-up of what we organized in December last year, but this time with far more comprehensive insight in the technical content.

Clean Sky is more than *just* Clean Sky. I mean, more than bringing technologies up to TRL 5 or 6. More than another funding source. It is, it will be, the rallying point, the flagship, the cornerstone, whatever metaphor you like, of European aeronautical research. With a large scale of TRL, as a matter of fact. This is another story maybe, but I think it’s time to re-think the L0/L1/L2/L3 scale of Projects and reconsider the whole picture. And then, the strength and the opportunities of this JTI approach will appear even more clearly. I wish to quote again the Interim Assessment report: there is a potential for Clean Sky to build a common European vision for environment focused research in Aeronautics. I would add (why to be so shy?) environment and competitiveness focused, like CS2 will be.

It is a common endeavour, a joint undertaking, literally. “Joint Undertaking”: you are invited *to join us for undertaking* a new journey, a new adventure.

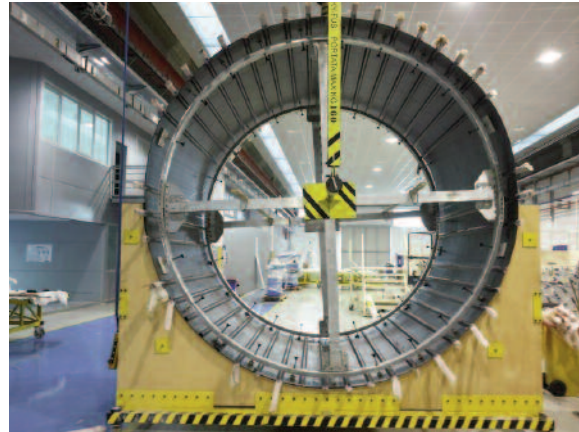
I wish you to enjoy this conference – I wish we will be able to meet your expectations today, and beyond.

SOME RECENT CLEAN SKY 1 ACHIEVEMENTS

ONE PIECE BARREL (OPB)

Alenia Aermacchi composite fuselage OPB demonstrator pre-production manufacturing came to light in December 2013. The One Piece Barrel (2.9 m length – 3.5 m diameter) has been realized with a co-bonding process where pre-cured Omega stringers are bonded on green skin. The OPB demonstrator of 90-seat advanced turboprop aircraft is based on: (i) more innovative multi-functional layer and multi-layer architectures leading to considerable weight reduction; (ii) better acoustic insulation; (iii) increased all-impact performance; (iv) use of various sensor technologies to monitor the health status of the structure and report the degradation of its mechanical properties.

This component represents the ‘pioneer’ of composite technology application to such an important primary structure (fuselage) of a regional aircraft.



HYBRID ICE PROTECTION SYSTEM

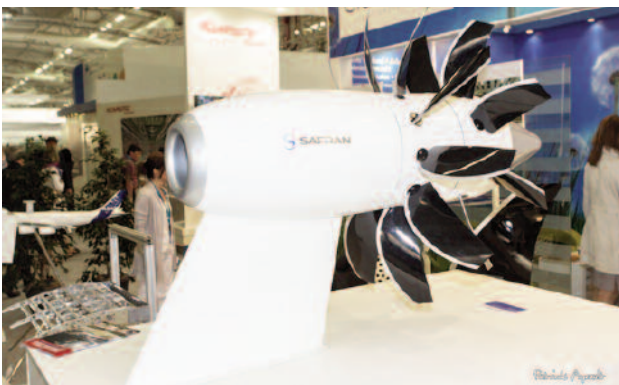


Within the framework of SGO ITD (System for Green Operations Integrated Technology Demonstrator) Clean

Sky programme, Aerotek UK, working with Alenia-Aermacchi, was responsible for the planning execution and reporting of an icing test conducted on ice protected wing section provided by Dassault Aviation. The equipment HIPS (Hybrid Ice Protection System) was provided by Zodiac Aerospace. The tests were completed successfully in the IWT (Icing Wind Tunnel) of the Italian Aerospace Research Centre: the test conditions were taken from the in-flight icing design atmosphere specified in CS-25 Appendix C.

AMONG CUTTING-EDGE TECHNOLOGIES LEADING TO REACH ACARE OBJECTIVES

Contra-Rotating Open Rotor technology (CROR)



Contra-rotating open technology (CROR) engine is intended to power the single-aisle jets.

Low Drag Laminar Wing



Low drag laminar wing for future short and medium range, large passenger aircraft.

High compression Engine (HCE)



Eurocopter High Compression Engine (HCE) model is a new technology, providing sustainable alternative to the classic turbine engine, reducing both fuel consumption and emissions.

From information provided by Clean Sky

ABOUT SESAR

NATIONAL AVIATION AUTHORITIES REITERATE COMMITMENT TO SESAR PROGRAMME

The 2nd SESAR Regulatory Activities Workshop took place on 25 November 2013, involving a total of 43 participants including 26 National Authorities and 2 Military Authorities, as well as the European Aviation Safety Agency (EASA), EUROCONTROL and the European Commission. Many topics were discussed. EASA and a number of National Authorities presented details of their involvement in SESAR, specifically expressing their interest in developing standardized regulation and roadmaps, and their willingness to become more involved in the SESAR programme.

STOCKHOLM 26 TO 28 NOVEMBER 2013: SESAR INNOVATION DAYS

SESAR INNOVATION DAYS CELEBRATE SCIENTIFIC EXCELLENCE

From 26 to 28 November 2013 in Stockholm, SESAR held its annual SESAR Innovation Days event at the KTH Royal Institute for Technology. The event celebrated scientific excellence through a series of workshops and research exhibitions and provided the backdrop for the award ceremony of the 2013 SESAR Young Scientist Award.

SESAR Innovation Days welcomed 175 participants who joined 3 days of discussing scientific research progress and results through presentations, information exchange, workshops and self-discovery.

The content of the event was launched by Pr Jacco Hoekstra, from TU Delft, with a future-looking speech 'Change in the Air', speculating on the future ATM Research. Built on this opening, came sessions presenting research work on:

- Enabling Change,
- Complex systems,
- Airports,
- Resilience,
- Trajectory management,
- Human Factors and Safety,
- Remotely Piloted Air Systems (RPAS),
- Delivering information from a Remote Tower perspective.

The SESAR Young Scientist 2013 was awarded to Manuel Soler, for his work on 'Commercial Aircraft Trajectory Optimization based on Multiphase Mixed Integer Optimal Control', which was recognised for its innovative modelling and interdisciplinary solution approach to the trajectory modelling problem, as well as for strong engagement with European Research Centres and with the USA.

ABOUT SESAR DEMONSTRATION ACTIVITIES

Preliminary results from latest round of SESAR Demonstration Activities reveal significant perfor-

mance gains.

Demonstration Activities aim at bridging R&D towards deployment proving the benefits of SESAR solutions in real-life environments. Against this background, a range of stakeholders from airlines, air navigation service providers (ANSP), the manufacturing industry and airports work together on projects lasting maximum 24 months in order to demonstrate SESAR concept and technologies.

Following the 2012 call for tender, there are currently **18 SESAR Demonstration Projects** running across Europe and the North Atlantic, which are co-financed by the SESAR Joint Undertaking.

A workshop held in Lisbon on 28 and 29 November 2013,

hosted by Nav Portugal, brought together over 40 Experts, representing 60+ organisations, working together on these Demonstration Projects, allowed them to share and review preliminary results.

The preliminary results demonstrate that on more than 5000 commercial flights, involving over 20 air operators, significant performance gains can be achieved on flights within Europe, as well as flights between Europe and North America, Latin America or Africa.

These performance gains cover a wide range of key areas: (i) better customer satisfaction, through smoother flights and punctuality; (ii) environmental efficiency; (iii) air navigation service provision productivity; (iv) safety; (v) capacity.



THE PILOT COMMON PROJECT

The Pilot Common Project (PCP) is a key step towards the deployment of SESAR. The European Commission has launched a consultation on this theme at the end of December 2013, addressed to operational stakeholders active in the ATM sector (civil and military airspace users, air navigation service providers and airport operators) and to organisations, bodies and public administrations related to this sector. The PCP contains the first set of ATM functionalities having completed their research, development and validation cycle. The results of this consultation are being used by the EC to draft the final text in view of the adoption of the PCP Regulation, the Deployment Programme and the Implementation Projects.

From information provided by SESAR

SPARKJET

By Professor Doyle Knight, Department of Mechanical and Aerospace Engineering Rutgers, the State University of New Jersey New Brunswick, NJ 08854

EUCASS, the European Conference for Aero-Space Sciences, submitted for publication in the CEAS Quarterly Bulletin a paper from Professor Doyle Knight concerning the high-speed flight 'SPARKJET' programme. This is with the greatest pleasure that our bulletin accepts to publish it, marking so the beginning of quite a fruitful cooperation between both societies.

Civilian and military interest in high speed flight has grown dramatically in recent years with major research efforts including for example the US X-43 and X-51 scramjet demonstrators, the German SHEFEX I and II research vehicles and the Indian/Russian Brahmos supersonic cruise missile. A major limitation of current high speed vehicle designs, however, is the lack of ability for rapid maneuver, i.e., the ability to change the forces and moments on a high speed vehicle in a timeframe corresponding to the vehicle traveling a distance equal to its length. Consider, for example, the X-51 traveling at Mach 7 at 18 km altitude. The length of the X-51 is 8 m, and therefore the vehicle travels a distance equal to its length in less than 4 milliseconds. Conventional control surfaces maneuver a vehicle by chan-

ging the pressure distribution through modification of the external geometry. However, they are incapable of actuation in millisecond time intervals due to their inherent inertia. Another mechanism is needed to achieve rapid maneuvering of a high speed vehicle. The SparkJet is a plasma-based synthetic jet with significant potential for this purpose. Originally developed at the Johns Hopkins University Applied Physics Laboratory^{1,2}, the SparkJet is comprised of a small cavity containing two (or three) electrodes connected to a high voltage supply (*Fig. 1*). The exit to the cavity is a converging nozzle, and the electrical discharge generates a high pressure gas which exits the nozzle and generates a significant impulse. Subsequent to the discharge the cavity refills due to the heat transfer to the cavity boundary. A typical cavity volume is several cubic centimeters and the discharge time is several milliseconds. Analysis by Anderson and Knight³ indicates that a specific impulse of 100 sec is achieved at an altitude of 18 km for a cavity volume of one cubic centimeter and a net energy input of 30 mJ. An array of SparkJet, therefore, could conceivably achieve rapid maneuvering of a high speed vehicle.

Further research is needed to understand the physics of the recharge cycle and to improve the SparkJet efficiency⁴. Systems engineering analyses are required to determine the feasibility and cost, the impact on vehicle design, and mission optimization. ■

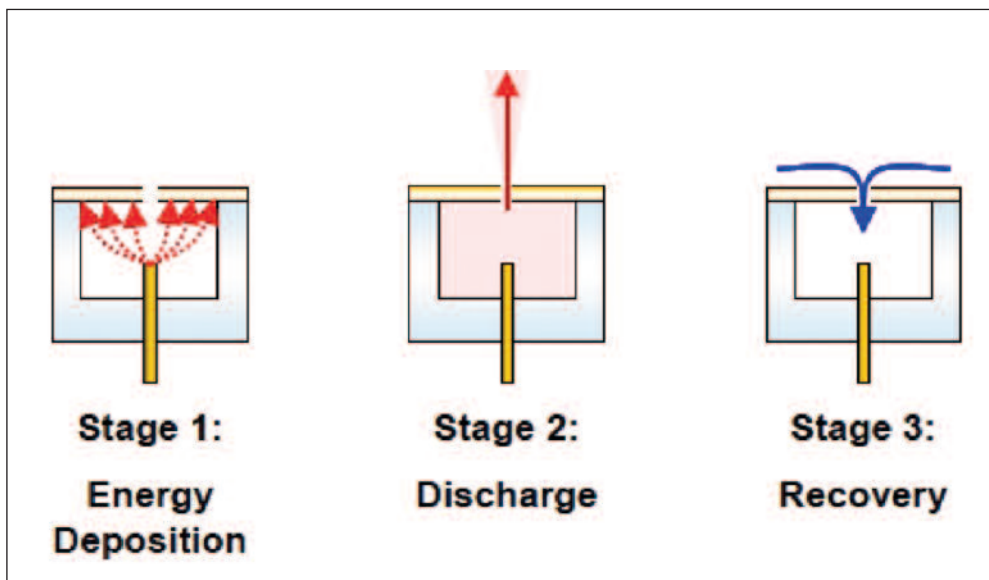


Fig. 1 SparkJet (from Popkin et al2)

1. Grossman, K., Cybyk, B., Rigling, M., and Van Wie, D., "SparkJet Actuators for Flow Control," AIAA Paper 2003-0057, American Institute of Aeronautics and Astronautics, Reston, VA, January 2003.
2. Popkin, S., Cybyk, B., Land, H., Emerick, T., Foster, C., and Alvi, F., "Recent Performance-Based Advances in SparkJet Actuator Design for Supersonic Flow Applications," AIAA Paper 2013-0322, American Institute of Aeronautics and Astronautics, Reston, VA, January 2013.
3. Anderson, K. and Knight, D., "Plasma Jet for Flight Control", AIAA Journal, Vol. 50, No. 9, September 2012, pp. 1855-1872.
4. Golbabaei Asl, M., Knight, D., Anderson, K. and Wilkinson, S., "SparkJet Efficiency", AIAA Paper 2013-0928, American Institute of Aeronautics and Astronautics, Reston, VA, January 2013.

SIGNIFICANT IMPROVEMENTS FOR GLOBAL AVIATION SAFETY IN 2013

The start of 2014 marks the 100th anniversary of commercial aviation together with the achievement of the best safety record in aviation history. Worldwide fatal accidents involving large commercial air transport aeroplanes were lower in 2013 than any other year in the last decade, with 17 accidents, compared with a yearly average of 27. In line with this reduction in the number of fatal accidents, there has been a significant reduction in the number of fatalities worldwide: in 2013 there were 224 fatalities, compared with a yearly average of 703 between 2003 and 2012.

There were no fatal accidents involving large commercial air transport aeroplanes in EASA Member States in 2013. In the same year, airline operators in EASA Member States performed approximately 6 million commercial air trans-

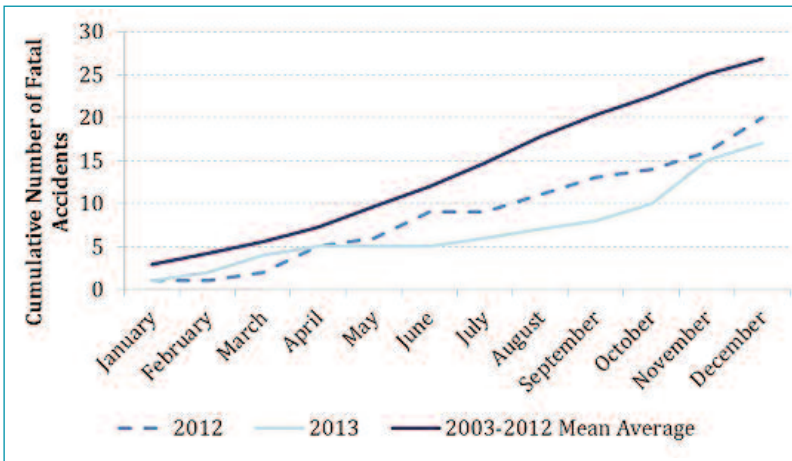
port flights, transporting over 800 million passengers. “Europe continues to have one of the strongest safety records in the world, however this positive picture cannot be taken for granted; as traffic over European skies and worldwide increases, we need to continue our efforts to maintain and even improve aviation safety”, commented Patrick Ky, Executive Director of EASA.

The graph below shows the cumulative number of fatal accidents per month worldwide, in commercial air transport, comparing 2013 with 2012 and with the average for the decade 2003-2012.

A great deal of work continues at a European level to further improve aviation safety through the European Aviation Safety Plan. The plan connects the safety issues identified with the actions and initiatives launched to address the underlying risks. The most recent version of the plan can be found here.

In the coming months, EASA will publish its Annual Safety Review for 2013, providing an overview of aviation safety in Europe and covering all major sectors of aviation, from Commercial Air Transport to General Aviation and Aerodrome and Air Traffic safety.

From www.easa.europa.eu/communications/



EUROPEAN AVIATION SAFETY PLAN 2012-2015

The ‘European aviation safety Plan 2012-2015’ constitutes the second edition of the **European aviation safety Plan**. It covers the period 2012 to 2015 and has been developed according to the same methodology as for the first edition. The Executive Summary of this document is reproduced here after.





European Aviation Safety Plan 2012-2015

1 Executive Summary

Like the first edition, this second edition of the Safety Plan encompasses three broad areas: systemic, operational and emerging issues. The risks identified in these areas are mitigated by safety actions that Member States, EUROCONTROL, the European Commission, the industry and the Agency take on board. All the partners work together, streamline their activities and add their efforts to drive our accident rates even further down.

Furthermore, this second edition consists of two parallel activities:

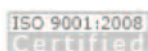
- a. On one hand, it provides a report on the status of the 91 standing actions developed last year. A progress report with the details on each of the actions is included in **attachment A**. This has been obtained in coordination with the various action owners. Additionally, a brief summary of the progress made in each of the safety areas has been included in the main body of the document (sections 2 to 6).
- b. On the other hand, it expands the initial list of actions proposed in the first edition by incorporating 24 new actions. These new actions have been reviewed by EASAC and have been placed within the existing framework. They take into consideration new safety initiatives aimed at mitigating the existing risks.

The introduction contains details on the methodology, communication and governance aspects of the Plan. Furthermore it makes reference to the Communication recently adopted by the European Commission on *Setting up an Aviation Safety Management System for Europe*.

Overall twenty three (23) Member States have formalised the commitment to voluntarily implement the Safety Plan by nominating a focal point. A summary of the various coordination activities with the Member States is also included in the introduction. The further development of State Safety Programmes will make a difference in the paradigm shift towards a more proactive approach to safety promoted in the Safety Plan.

In 2011, twelve (12) actions have been finalised. Among the completed actions we find the first requirements containing safety management provisions in the areas of flight crews and air operations, the establishment of a Network of Analysts to better coordinate safety analysis activities at European level, the assessing of the first performance plans containing SPIs for the ATM domain, the European contribution to the global approach to mitigate the risk of runway safety taken by ICAO, the development of an EASA automation policy and the organisation of a safety conference to tackle the risk factors that contribute to loss of control, the number one concern in aviation safety.

Almost 60% of the actions are on schedule according to the initial Plan. Significant efforts have been made to deliver results on-time. This new edition will facilitate maintaining focus on advancing actions to mitigate the major risks to aviation safety across Europe.



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RECOMMENDATIONS TO AVOID A STRATEGIC DOWNGRADING OF EUROPE IN THE FIELD OF COMBAT AVIATION¹ FOLLOWING THE EUROPEAN FORUM ORGANISED IN PARIS ON MAY 16TH, 2013



1. Recent crises have demonstrated that Europe now fully relies on a powerful and autonomous combat air power to ensure its security:

1.1. Fundamental needs

Mastering combat aviation is vital in terms of national and European sovereignty. This capacity is key in each of the three main military missions: to protect, to deter and to act. Air power is the only military power capable of "providing an efficient answer in very short time to any political decision makers and to react to an unexpected threat. Key words are: reactivity, accuracy, flexibility, reversibility, strike coordination and long range operations"².

Fast, efficient and accurate air power can act immediately and send a strong political signal in time of peace, crisis or war.

The recent crises which have been managed successfully have proven that without a powerful air combat force, the final issue could have been different and maybe inhibited the decision to intervene.

Air superiority has become the asymmetric tool of advanced nations: without this capacity in the third dimension, acquired thanks to long lasting investments, there is no freedom of action for the troops on the ground and little "strategic" visibility for the political decision-maker. This explains why a competition is on-going worldwide to acquire autonomy and excellence in the field of air power. In a parallel to the initiatives taken by the United States who have developed the F22 and are developing the JSF / F35 with the financial participation of some European nations, quite a few emergent States are now developing and producing, in the framework of a relentless quest for autonomy and technological control, some powerful combat aircraft which will soon be exported all over the world. Their strategic ambition will become a reality in 10 - 15 years from now with the arrival of next generation aircraft such as T50 in Russia and in India or J20 and J31 in China. At present, despite this clear evidence of developments in technologies and capacity amongst the other leading

powers, Europe is not preparing any roadmap or structured plan towards its own next generation air combat system.

1.2 Needs derived from NATO Membership

Coherently with Robert Gates' June 2011 declaration, the Pentagon, with the recent "Defence Strategic Review" made public on January 5th, 2012, has begun a strategic reallocation of US military assets towards the Pacific. Since that date, the United States has decided that it would supply no more than 50 % of military means at the disposal of the NATO in conformance with each of the necessary military capacities: the US needs strong Allies in Europe.

Whether it likes it or not, Europe will increasingly have to assess its own strengths and its ability to take on the responsibilities of stabilization and possible intervention, in its own sphere of geographical responsibility.

These decisions should drive the Europeans to federate their strengths and to maintain important strategic and autonomous capacities regarding air combat power.

1.3 New needs in a predictable future

Emerging countries are demonstrating a strong determination to develop new airborne systems among which some will be in advance of current European capabilities. They will probably be prepared to export them to third countries with no guarantee that they will not be used against Europe's interests. This new threat could be real by 2025, before the first flight of any new generation European combat aircraft. The remarkable Russian T50 should in particular begin to be exported in this timeframe

Most of the European countries consider however that if new threats do arise in 2025, the capability gap in air defence, combat air support and in-depth strike, will only materialise between 2030 and 2035.

As regards the recce UAVs operating medium or high altitude, needs are immediate and the lack is already obvious: nations have no other choice of leasing or buying from the US either Predators A or B or Reapers. These UAVs can also

1. In our wording, « combat aviation » means « air combat systems » including the whole global system with ground, the couple inhabited plane and UCAV, engines, equipment and armament.

2. General Mercier, French Chief of air staff, Forum in Paris May 16 201 : The future of the european combat aircraft industry.

carry weapons and operate accurate destruction missions, but this need seems less urgent than the intelligence ones.

1.4 Specific needs for European nations

France and the United Kingdom seem more sensitive than other European nations to the need for multi-role aircraft, inhabited or remote-controlled. Germany seems to give priority to the intelligence mission for UAVs, knowing that France, United Kingdom, Italy and other nations also clearly express this need.

1.5 Economical and political aspects

The combat aerospace industry remains a substantial contributor to national economies creating highly qualified employment and advanced technology, feeding the civil aviation sector as well as many of the other state-of-the-art branches of industry, laboratories and universities. This industrial know-how is dependent on a vast network of major suppliers including engine makers, equipment manufacturers and all the industry of armament. All in all, more than 120.000 specialists are employed in the combat aerospace industry in Europe.

The real risk of the disappearance of these skills would have far reaching and damaging consequences putting at risk current export markets where there are needs to keep a significant competitive advantage.

Even though the current economic crisis has deeply impacted defence budgets there is ample scope to achieve considerable economies by merging design and development capabilities for new shared programmes.

It is also important to note that the sale of successful armament systems, in particular combat aircraft, has allowed in the past the conclusion of strategically important security agreements between some European nations and some nations outside Europe.

2 Europe is approaching the point of no return in the preservation of its air power and the associated industry:

2.1 Fighter aircrafts and UCAV

Since World War 2, Europe has developed and produced a number of generations of internationally competitive combat aircraft. Today three different planes are in production and operating: the Rafale, Eurofighter and Gripen. They guarantee the needs for Europe and strengthen its industrial and strategic independence.

This industrial inheritance must be maintained to enable a common successor from pooled capabilities. To date, no such initiative in this direction has yet been taken.

Some European nations have chosen, on the contrary, to co-finance the American F35 for an amount of about 8 billion Euros, comparable to the price of a European development. The R&D teams of the main European prime contractors have lost 50 % of their staff members since the end of the

development phases of the current in service aircraft.

However, some clear-sighted decisions have been taken to the launch of two UCAV demonstrators: nEUROn of Dassault in France and Taranis of BAESystems in the United Kingdom. They should open the way to a common development (LOI signed on 17/02/2012).

It is also worth mentioning the Barracuda of EADS-Cassidian, a demonstrator of UAV for ground penetration and recognition roles, still in operation, and Sky X-Y from Finmeccanica-Alenia.

It is finally necessary to underline the quality of the study FAS4Europe led under the aegis of the EDA in 2011. This excellent study identifies a road map in three phases (technical projects, demonstrators and programs to be launched) allowing the development of future European air systems.

2.2 Recce and intelligence UAV capable to be armed

France has ordered some modifications to the Israeli UAV Heron by EADS, and bought 3 models of this new version called "Harfang". The experiment is now terminated: France is now going to join United Kingdom and Italy to buy American Reapers.

Germany who developed the concept Talarion plans to move in the same direction. It has also just stopped the EuroHawk program, which demonstrates the fragility of importing of a foreign concept and the value of internal developments in Europe to meet European needs.

2.3 Technical needs and technical capacities to be maintained

On the technical side the needs are high performance and global strength organized in a complete network in which the missions are managed and optimized with flexibility and for safety standards and interoperability of networks. System studies, design of the plane, architecture of the functions, and technological performance are already mastered in Europe but need to be preserved and developed in some cases. These capacities need long lasting investments but are easily and rapidly lost.

2.4 Importance of a strong industrial base

A more and more important element of such a base is linked with the use of the air combat systems in operations. A permanent industrial support, close to the user, is absolutely necessary during air operations. This industrial support is also needed to ensure the evolution of the system during its life cycle. This double industrial support is the responsibility of the system supplier and requires the preservation in Europe of state-of-the-art industrial skills in order to have complete independence. It should also be noted that such freedom to update systems requires Intellectual property usually denied for imported products

2.5 Participation to a non-European program

The acquisition outside Europe or even the participation to a non-European program of development and production

are not sufficient to maintain a European know-how, because the key technologies always stay under the complete control of the industrial leader. This has become clear with the experience of the nations collaborating with the USA on the F35.

3 Proposed roadmap with six Key Recommendations:

Recommendation n°1 - Definition of a European Vision for Air Combat:

To avoid difficulties previously encountered in trying to converge national requirements it is recommended to first construct a European vision for future air theatre of operations.

Such a task ideally fits the responsibilities of the EDA (The European Defence Agency) who could be mandated to undertake this by member states willing to support it.

Recommendation n°2 – Definition of needs, doctrines and systems:

From the above Vision and using analysis already conducted, in particular the Global System Study of ETAP (European Technology Acquisition Programme) as a base for combat air systems, create a European working group for the analysis of needs and common definition of interest of all parties. This WG, presided over by the EDA, should consist of institutional representatives coming from nations who have decided to cooperate. When needed, industrialists will bring their support to the systems studies with technico-operational simulations.

The mission of the group would be: to federate the prospective vision, to define a concept of needs and use, to develop a collective project and to define the hard point, schedules and major milestones of the programmes.

Important remark: The priorities between fighter aircraft and recce UAVs being different amongst the various nations, and corresponding to rather different technologies, it seems reasonable to envisage that these two domains would be separately managed with different industrial responsibilities.

Recommendation n°3 - Focus of the skills and the technical financing:

The technological skills will need to be focused on a more limited number of suppliers, to minimize the financing of the

preliminary research before the development phases. A working group bringing on equal footing Member States and Industrial Associations, led by the EDA and the ASD (Aerospace and Defence Industries association of Europe), could be set up quickly to propose a methodology and Terms of Reference. A roadmap for technological tasks and a plan of long-term investment will need to be settled in a coherent way with this organization, based on the development programme previously defined. These reflections and decisions would take into account the study FAS4Europe realized under the aegis of the EDA with the same participants.

A particular attention will have to be paid in the definition of common standards, aiming at a maximal interoperability and an optimization of the developments.

Recommendation n°4 - Decision to launch technical and operational demonstrators:

Beyond the need to mature the required technologies and keep the high level of skills and knowledge in Design teams, Demonstrators will be necessary to understand and solve the technical and operational hard points and maintain the development programme. They should be defined as a result of the studies emerging from Recommendation 2. The FR/UK LOI of February 17th, 2012 provides a good example of this.

Recommendation n°5 - Decision to launch programs of fighters and UAVs:

it is recommended that one or possibly several programmes of operational fighters and UAVs will need to be initiated from the previous work. The FCAS project of the LOI between FR and UK of February 17th, 2012 is a promising step towards this wider goal.

Important remark on the industrial organization: For the demonstrators or the programmes, every development will need to be placed under the responsibility of a prime contractor (this prime contractor could be an existing company or a new entity created by industrialists after program decision is given) with a supply chain, all chosen on the basis of “best athlete”.

Recommendation n°6 - Modernization of the fleets:

In parallel to the previous recommendations, a logic of modernization of the fleets must be pursued to maintain at all times the operational capacities of Europe and to perpetuate the technological level of the industry. ■

GALILEO ACHIEVES ITS FIRST AIRBORNE TRACKING

On 12 December 2013, ESA's Galileo satellites have achieved their very first aerial fix of longitude, latitude and altitude, enabling the in-flight tracking of a test aircraft.

The four Galileo satellites in orbit have supported months of positioning tests on the ground across Europe since the very first fix back in March 2013.

12 November 2013: first aerial tracking using Galileo

This milestone has taken place, on a Fairchild Metro-II above Gilze-Rijen Air Force Base (NL) at 12:38 UT, marking the first time ever that Europe has been able to determine the position of an aircraft using only its own independent navigation system.



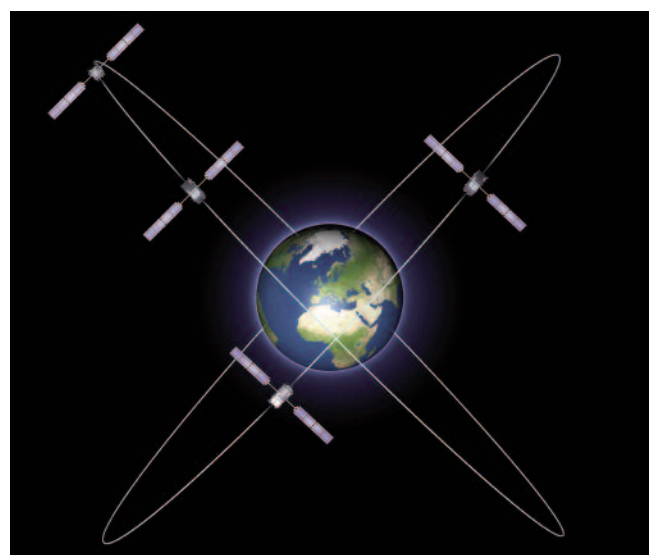
Aircraft tracking via Galileo. Credit ESA

It came as part of an aerial campaign overseen jointly by ESA and the NLR, with the support of EUROCONTROL, the EASA and the Dutch Air Navigation Service Provider (LVNL).

A pair of Galileo test receivers was used aboard the aircraft, the same kind currently employed for Galileo testing in the field and in laboratories across Europe. They were connected to an aeronautical-certified triple-frequency Galileo-ready antenna mounted on top of the aircraft.

Tests were scheduled during periods when all 4 Galileo satellites were visible in the sky – 4 being the minimum needed for positioning fixes.

The receivers fixed the aircraft's position and, as well as determining key variables such as the 'position, velocity and timing' accuracy, time to first fix, signal to noise ratio, range error and range-rate error.



Testing performed when 4 Galileo satellites are visible. Credit ESA

Testing covered both Galileo's publicly available Open service and the more precise, encrypted public regulated service, whose availability is limited to governmental entities.



Aircraft used for Galileo testing. Credit ESA

Flights covered all major phases: take off, straight and level flight with constant speed, orbit, straight and level flight with alternating speeds, turns with a maximum bank angle of 60°, pull-ups and push-over, approaches and landings. They also allowed positioning to be carried out during a wide variety of conditions, such as vibrations, speeds up to 456 km/h, accelerations up to 2 g horizontal and 0.5-1.5 g vertical, and rapid jerks. The maximum altitude reached during these flights was 3,000 m.

From information provided by ESA

ON 19 DECEMBER 2013: LIFTOFF FOR ESA'S BILLION-STAR SURVEYOR "GAIA"



Soyuz VS06, carrying the "Gaia" space observatory, lifted off from Guyana Space Centre (CSG), on 19 December 2013..
Credit ESA

The Soyuz launcher lifted off at 09:12 UT. The launch mass was 2039 kg including:

- Payload 710 kg;
- Service Module 920 kg;
- Propellant 400 kg.

The instrument consists in two similar telescopes and imaging system: BP/RP Blue and Red Photometers – RVS Radial Velocity Spectrometer.

On 15 January 2014, the satellite finalised its entry into orbit around L2 Lagrange Point located at 1,5.10⁶ km from Earth. Why L2? Because at this point the gravitational forces between Sun and Earth, add up to compensate for the centrifugal force of Earth's motion around the Sun, and so L2 provides uniquely advantageous observation opportunities for studying our Galaxy as well as a moderate radiation environment. After the 4-month commissioning phase has been accomplished, 'Gaia' will effectively start its 5-year mission destined to create the most accurate map yet of the Milky Way.

Repeatedly scanning the sky, 'Gaia' will observe each of the billion stars on average of 70 times each over the five

years. It will measure the position and key physical properties of each star, including its brightness, temperature and chemical composition.

By taking advantage of the slight change in perspective that occurs as it orbits the Sun during a year, it will measure the stars' distances and, by watching them patiently over the whole mission, their motions across the sky.

The position, motion and properties of each star provide clues about its history, and Gaia provided data will allow scientists to piece together a 'family tree' for our home Milky Way.

The motions of the stars can be put into 'rewind' to learn more about where they came from and how the Milky Way was assembled over billions of years from the merging of smaller galaxies, and into 'fast forward' to learn more about its ultimate fate.

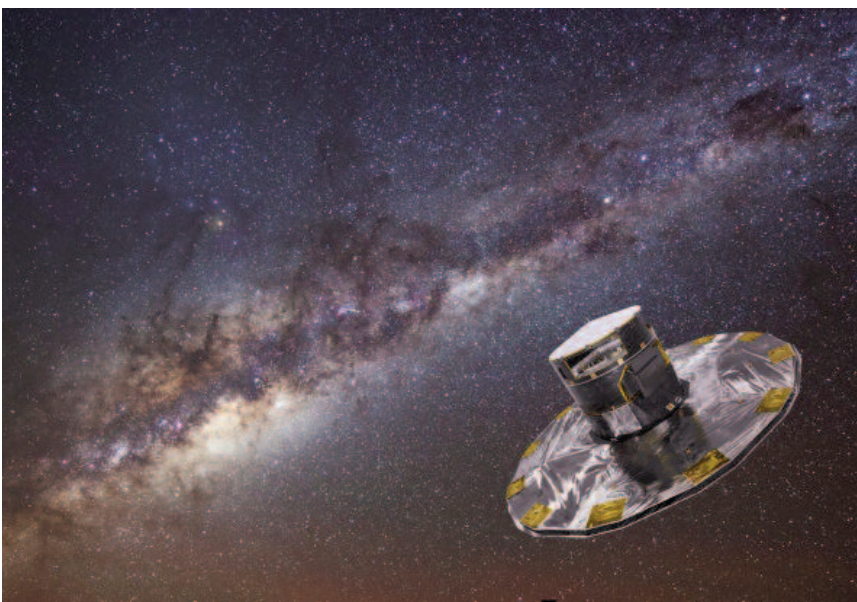
By comparing its repeated scans of the sky, Gaia will also discover tens of thousands of supernovas, the death cries of stars as they reach the end of their lives and explode. And slight periodic wobbles in the positions of some stars should reveal the presence of planets in orbit around them, as they tug the stars from side to side.

Gaia will also uncover new asteroids in our Solar System and refine the orbits of those already known, and will make precise tests of Einstein's Theory of General Relativity.

After 5 years, the data archived will exceed 1 million Gigabytes: the task of processing and analysing these data will be conducted by the 'Gaia Data Processing and Analysis Consortium', comprising more than 400 individuals across at scientific institutes across Europe.

Under ESA management, the spacecraft was designed and built by Astrium, with a core team composed out of Astrium France, Germany and the United Kingdom.

From information provided by ESA



Gaia' mapping the stars of the Milky Way.
Credit ESA/ATG medialab. Background image: ESO/S. Brunier

THE CEAS/ASD AEROSPACE EVENTS CALENDAR

The CEAS and ASD have created an innovative tool so-called "CPMIS" (Conference Programming Management Information System), the aim of which is to facilitate the search of the different aerospace events in the world that are programmed at short and mid-term time horizon, and so allowing to optimise the scheduling of future events by avoiding possible overlapping and redundancies, but on the contrary to encourage co-operations and synergies between the actors concerned. Its role is therefore double: information on the one hand, conference programming enabler on the other.

THE ADDRESS IS: <http://www.aerospace-events.eu>

A search engine selects the events according to specific topics and key words. A graphic display (day, week and months view) eases the access and the view.

- 4 TYPES: Conference, Workshop, Lecture, Air Show
- 6 MAIN CATEGORIES: Aeronautical sciences - Aerospace (for events including all aspects of aviation and space) - Civil Aviation - Air power - Space - Students and Young Professionals.

- 64 SUB - CATEGORIES: aeroacoustics - aeroelasticity - aerodynamics, etc.

AUTOMATIC INSERTION OF NEW EVENTS BY THE ORGANISERS THEMSELVES:

- Go to <http://www.aerospace-events.eu>
- Click on the "introduction" text
- Redirected on the New Event Form, you have to click on this form and to enter your event related information, validate, click on Save and send.

CONTACTS:

postmaster@aerospace-events.eu is the general address for any question and requests;

- Marc de Champs, responsible for the CPMIS computerized tool management at ASD (AeroSpace and Defence industry associations of Europe): marc.dechamps@asd.europe.org
- Jean-Pierre Sanfourche, CEAS, responsible for the Events Calendar permanent updating and validation: jpsanfourche@dbmail.com

YEAR 2014

04-06 March • **ATM World Congress** - World ATM Congress 2014 - Madrid (Spain) - IFEMA Feria de Madrid - Partnership CANSO-ATCA - <http://www.worldatmcongress.org/>

12-14 March • **3AF/CEAS** - Greener Aviation - Conference - Brussels (Belgium) - Square Meeting Centre Mont des Arts - <http://www.greener-aviation2014.com>

19 March • **AEE** - Safety Security of Space Activities - Brussels (Belgium) - Acad. Royale de Belgique www.air-space-academy.com

25-26 March • **RAeS** - Aircraft Commander in the 21th Century - London - RAeS/HQ - www.aerosociety.com/Events

27 March • **EDA** - Annual Conference 2014: European Defence Matters - Brussels (Belgium) Albert Hall - www.eda.europa.eu/info-hub/events

01 April • **RAeS** - UAS Operations - London - RAeS/HQ - www.aerosociety.com/Events/

13-17 April • **ESA** - ESPC 2014 - 10th European Space Power Conference - Noordwijkerhout (NL) - NH Conference Centre - www.congrexprojects.com/2014-events/14a05

15-16 April • **STAC** - AUN2014 - Airports in Urban Networks Conference - Paris - CNIT La Défense - www.aun2014.scincesconf.org

23-25 April • **ASD** - ASD Annual Convention 2014 - Prague (Czech Republic) - Hilton Prague Hotel - www.asd2014.org

29-30 April • **ATAG (Air Transport Action Group)** - ATAG Aviation & environment summit - Geneva (Switzerland) - President Wilson Hotel - <http://www.envirosummit.aero/>

YEAR 2014

05-07 May • **ESA** – IWGGMS – 10 – Workshop on Greenhouse Gas Measurements from Space – Noordwijk (NL) – ESA/ESTEC – www.congrexprojects.com/2014-events/14c02/

07-08 May • **ICAO** – 2nd Air Transport Symposium – Montréal (Canada) – ICAO/HQ – www.icao.int/Meetings/iats2014

19-22 May • **3AF/ESA/CNES/DLR** – Space Propulsion 2014 – Cologne (Germany) – Maritim Hotel köln
www.propulsion2014.com

20 May • **RAeS** – The Future of Weapon Systems Trials – Qinetiq/HQ – SPA 0JF, UK – Boscombe Down Amesbury Salisbury – www.aerosociety.com/Events/

20-22 May • **ESA** – Sentinel 2 – Workshop – Frascati (Italy) – ESA/ESRIN
<http://www.seom.esa.int/S2forscience2014>

20-22 May • **ESA** – 5th EMPPS Workshop – Electronic Materials, Processes and Packaging for Space – Noordwijk (NL) – ESA/ESTEC – www.congrexprojects.com/2014-events/14c06/

20-22 May • **EBAA/NBAA** – EBACE 2014 – 14th Annual European Business Aviation Convention & Exhibition – Geneva (Switzerland) – Palexpo and geneva International Airport – www.ebace.aero/2014/

20-25 May • **BDLI/Messe Berlin** – ILA Berlin 2014 – Air Show – Berlin (Germany) – Berlin Expo Centre Airport
<http://www.ila-berlin.de/>

26-28 May • **Elektropribor/AIAA** – 21st St-Petersburg integrated Navigation systems – St-petersburg – Concern CRI Elektropribor – www.elektropribor.spb.ru/

26-30 May • **ESA** – 4S Symposium 2014 – Small Satellites Systems Symposium – Porto Petro, Mallorca (Spain) – Conference Centre – <http://www.congrexprojects.com/2014>

02-06 June • **ESA** – GNC 2014 – 9th ESA International Conference on Guidance, Navigation and Control Systems – Porto (Portugal)- Congress Centre – <http://www.congrexprojects.com/14a01>

04-05 June • **RAeS** – Flight Simulator Conference – London (UK) – RAeS/HQ – www.aerosociety.com/events

10-11 June • **SAE Int** – SAE 2014 Design Manufacturing Economics Composites – Madrid (Spain) – NH Parque Avenidas – www.sae.org/events/dtmc/

10-13 June • **ESA** – 9th ESA Roundtable on Micro Nano Technologies (MNT) – Lausanne (Switzerland) – Swiss Tech Convention Centre – <http://www.congrexprojects.com/14c03>

12-14 June • **CANNES AIR SHOW** – 8th General Aviation Exhibition Cannes – Cannes Mandelieu Airport – www.cannesairshow.com

16-18 June • **ACI Europe/Fraport AG** – ACI Europe General Assembly 2014 – Frankfurt Airport (Germany)
www.aci-europe-events.com/

16-20 June • **AIAA/CEAS** – 20th AIAA/CEAS Aeroacoustics Conference – Part of AIAA Aviation Conference 2014 – Atlanta (Georgia), USA. Hyatt Regency Atlanta – <http://www.aiaa.org/events>

16-20 June • **AIAA/CEAS** – 20th AIAA/CEAS Aeroacoustics Conference – Part of AIAA Aviation Conference 2014 – Atlanta (Georgia), USA. Hyatt Regency Atlanta – <http://www.aiaa.org/events>

YEAR 2014

16-20 June • **AIAA/3AF** –ANERS 2014 – Aircraft Noise and Emissions Reduction Symposium – Part of AAC 2014 – Atlanta (Georgia), USA – Hyatt regency Atlanta – <http://www.aiaa.org/events>

17-20 June • **3AF** – MD10 – International Conference: Missile Defence, Challenges in Europe – Mainz (Germany) – Rheingoldsalle Conference Centre – www.3af.fr – alexa.faucher@aaaf.asso.fr



19-21 June • **EHS** – EHS 2014 – Hradec Kralové LKHK (Czech Republic) – Airport – www.eurohelishow.com/

14-20 July • **Farnborough International Ltd** – Farnborough 2014 – <http://www.farnborough.com/>

22-24 July • **RAeS** – Applied Aerodynamics Conference 2014 – Bristol (UK) – University Bristol Queen’s Building www.aerosociety.com/events

02-10 August • **COSPAR** – COSPAR 2014 – Moscow – State University – www.cospas-assembly.org/

02-05 September • **ERF/CEAS/RAeS** – 40th European Rotorcraft Forum 2014 Southampton (UK) – Grand Harbour Hotel www.erf2014.com



07-12 September • **ICAS** – 29th Congress of the International Council of Aeronautical Sciences – St-Petersburg (Russia) – Hotel Park Inn by Radisson Pribalt. – Hosted by TsAGI – www.icas2014.com/



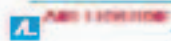
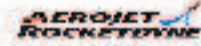
29 Sept.-03 October • **IAF** – 65th International Astronautical Congress – Toronto (Canada) – www.iafastro.org

07-09 October • **RAeS** – 4th Aircraft Structural Design Conference – Belfast (UK) – Queen’s University Belfast – www.aerosociety.com/events

14-16 October • **Helitech International** – Helitech international 2014 – Amsterdam (NL) – RAI – www.helitechevents.com/

03-05 November • **ACI Europe** – ACI Airport Exchange Conference & Exhibition 2014 – Paris – CNIT La Défense – www.airport-exchange.com/

13-14 November • **AAE/3AF** – Present and Future of civilian RPAS - Paris – DGAC/HQ www.academie-air-espace.com/RPAS



SPACE PROPULSION 2014

Maritim Hotel,
Cologne, Germany

19th to 22nd May 2014

www.propulsion2014.com

