



The Quarterly  
Bulletin of the

# CEAS

COUNCIL OF EUROPEAN AEROSPACE SOCIETIES

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



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# CEAS 2011

The international  
Conference of the  
European Aerospace  
Societies

FLYING TO THE FUTURE

**24-28 October**  
**Venice** - Italy

**AIDAA**



AFTER CEAS 2007 IN BERLIN AND CEAS 2009  
IN MANCHESTER: CEAS 2011, HOSTED BY AIDAA,  
THE ITALIAN ASSOCIATION OF AERONAUTICS & ASTRONAUTICS,  
WILL TAKE PLACE IN VENICE.

CEAS

## 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 14 Member Societies: 3AF (France), AIAE (Spain), AIDAA (Italy), CzAeS (Czech Republic), DGLR (Germany), FTF (Sweden), HAES (Greece), IIK (Finland), NVvL (Netherlands), PSAS (Poland), RAeS (United Kingdom), SVFW (Switzerland), TsAGI (Russia) and EUROAVIA.

Following its establishment as a legal entity conferred under Belgium Law, this association began its operations on January 1<sup>st</sup>, 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:

c/o DLR – Rue du Trône 98 – 1050 Brussels.

[www.ceas.org](http://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 Aeronautics Journal
- CEAS Space Journal
- CEAS Quarterly Bulletin

### 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.

### THE OFFICERS OF THE BOARD IN 2010:

President: [Pierre Bescond](#)  
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Vice-President, Finance: [Pierre Bescond](#)

Vice-President, Publications and External Relations: [François Gayet](#)  
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# EDITORIAL

## CEAS 2011 IN VENICE: FLYING TO THE FUTURE



Jean-Pierre Sanfourche  
Editor-in-Chief,  
CEAS Quarterly Bulletin

**C**EAS 2011 will be a joint event merging the third CEAS European Air and Space Conference and the twenty-first Congress of the Italian Association of Aeronautics and Astronautics (AIDAA). This Association, which will be hosting CEAS 2011, has chosen that most famous of cities, Venice, for its location.

Following the successful CEAS 2007 in Berlin and CEAS 2009 in Manchester, CEAS 2011 will be again a very good opportunity for European aerospace industries and institutions, research establishments, education and training centres as well as associations to present their works and points of view and to exchange information, debating innovative concepts and technical processes in aeronautics and space. Innovation should be at the heart of the event, this is the reason for its title: "Flying to the future".

The two primary objectives of the Venice Conference are to promote the sharing of knowledge and to contribute to the reinforcement of co-operation networks within the European Air and Space domain. The subjects put on the programme will cover a wide spectrum, including purely technical topics, operations, human factors, safety and security, certification and airworthiness, industry and market and aerospace research and development infrastructure. Moreover, particular initiatives are being taken with a view to facilitating student participation in the Conference, recognising that preparation for the future is to a great extent in the hands of youth. This is why it is so important to attract our best scientific students towards Air and Space!

In addition, many technical tours are foreseen as well as tourist visits for the delegates and the accompanying persons.

It is clear that the organisers are making all necessary arrangements to ensure that CEAS 2011 is a success, but this objective will be fully realised "if and only if" on the one hand, the attendance is large – above 500 – and on the other hand, the proportion of non-Italian delegates is quite significant, let's say above 30 percent.

The CEAS comprises now sixteen Member Societies, with the recent admission of Czech Aerospace Society, Romanian Aeronautics and Space Association, von Karman Institute of Belgium and EUROAVIA, the excellent Association for Aerospace Students placed under the aegis of Delft University. Sixteen is quite an impressive number, if we remember that five years ago, we still were only eight. So, it seems to me that all conditions are met to succeed: we must and we can!

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## THE 15<sup>TH</sup> TRUSTEES BOARD MEETING

The 15th trustees' board meeting of the CEAS was held on 2 December 2010 at the CEAS/DLR Office, Rue du Trône 98 in Brussels.

### Election and confirmation of officers

Dr Joachim Szodruich expressed his intention to cease as CEAS President. He proposed Mr Pierre Bescond (3AF) as candidate and his appointment was unanimously approved by the Board of Trustees. The latter thanked Dr Szodruich for all his excellent work over the past two years.

The Board of Trustees also approved unanimously to appoint Mr François Gayet Vice-President for Publications and External Relations for a two-year period. Mr Pierre Bescond accepted to continue holding the position of Vice-President for Finance, with the support of Ms Mercedes Oliver Herrero as Finance Manager.

### Two new Associate Members

#### • The Czech Aeronautical Society.

The CzAeS has been admitted as new Associate Member of the CEAS. Dr Szodruich welcomed and thanked Prof. Daniel Hanus, representative of this Society. Prof. Hanus took the opportunity to introduce the CzAeS. The letter he had addressed to Ms Oliver on 20 November 2010 to confirm the application of CzAeS is reproduced in pages 5-6.

#### • EUROAVIA

EUROAVIA, the European Association for Aerospace Students, was confirmed as Associate Member.

### A new Full Member

• The Polish Society for Aeronautics and Astronautics (PSAA) was admitted as Full Corporate Member.

### Two future Associate Members

Two organisations have applied to be admitted as CEAS Members:

- **VKI**, von Karman Institute for Fluid Dynamics, from Belgium, a non-profit international association founded in 1956 for the advancement of the study and application of the science of fluid dynamics in the NATO countries; it is to be noticed that this institute, in contrast to traditional academic institutions, provides training in research, through research: see pages 7-8.
- **AAAR**, Romanian Aeronautical & Astronautical Association, which groups most of the Romanian aircraft engineers, located in Romania, Europe and North America: see page 9.

Both organisations showed their interest to join CEAS some time ago and they addressed their formal application letters in the end of 2010.

### Web/Internet

Ms Oliver presented a proposal for design and maintenance of a new web page including hosting.

### Conference Programming Management Information System (CPMIS)

Mr Gayet and Mr Sanfourche presented a preliminary proposal of "CPMIS", a computerized tool aimed at keeping an overview of the major global aerospace events and at rationalizing the CEAS event programming. A decision concerning the implementation of this project should be taken on the occasion of the next PCC (Programme Coordination Committee) meeting, Madrid 31 March.

### CEAS registration

CEAS is registered on the European Commission Research Participant Portal and its Participant Identification Code (PIC) is **997741807**. Ms Oliver has been appointed as "Legal Entity Appointed Representative".

Next meetings:

- 31 March in Madrid: PCC meeting, CEAS Awards meeting, 16<sup>th</sup> Board Meeting;
- 23 June in Paris: PCC meeting, 17<sup>th</sup> board Meeting;
- 19 October in Venice: PCC meeting, 18<sup>th</sup> Board Meeting.

## THE AWARD CEREMONY: ALL HONOUR TO PROF. ERNESTO VALLERANI



On Thursday 1<sup>st</sup> December, the traditional CEAS Gala Dinner took place in the Conrad Hotel. On this occasion, President Szodruich presented the CEAS Golden Award to Prof. Vallerani. Standing up in the bottom: on the left, Joachim szodruich; on the right, Ernesto Vallerani expressing his thanks to the CEAS management.

In the evening of Thursday 1<sup>st</sup> December 2010, at the opening of the CEAS Gala Dinner in the Conrad Hotel of Brussels, Prof. Ing. Ernesto Vallerani received from the hands of the CEAS President Joachim Szodruich the prestigious CEAS Golden Award.

Ernesto Vallerani had played in the seventies and eighties quite a distinguished role in the Spacelab programme. He was in 1991-1996 President and Chairman of the Board of Alenia Spazio, and in 1996-1998 President of Finmeccanica-Alenia Aerospazio. In particular, in this last position, the realisation of the logistic module for the International Space Station (ISS) is due to him.

His contributions to the scientific community have been notably exercised during his presidency of the AIDAA and also in his capacity of CEAS President in 1995 and 2001.

# THE CZECH AERONAUTICAL SOCIETY: OUR NEW ASSOCIATE MEMBER



ODBORNÁ SPOLEČNOST LETECKÁ ČESKÉ REPUBLIKY  
CZECH AERONAUTICAL SOCIETY

*Zakládající člen ČSVTS a člen ČNV FEANI  
Founder Member of Czech Association of Scientific and Technical Societies and Member of Czech National  
Committee for FEANI*

In Prague, 20 November, 2010

To kind attention of  
Mercedes Oliver Herrero  
CEAS Director General

## **Application for admission as a new CEAS Member**

Dear Ms. Director General,

By agreement and kind invitation of Professor Joachim Szodruch I have pleasure to present to the General Assembly of the CEAS the application of the Czech Aeronautical Society (CzAeS) for admission as a new member of CEAS.

The Executive Board of the CzAeS was familiarized with all legal documents - Statutes and Bylaws of the CEAS which you have sent us (Hamburg agreements 2005, Signed version of Statutes, Bylaws and agreements (dated September 2005), CEAS Statutes 28. 11.2005 and Updated Statutes signed in November 2005).

The CzAeS ExBo taking in account these legal documents expresses its endorsement to all of these legal CEAS documents and also expresses the CzAeS willingness and commitment to advance the purposes and endeavors of the CEAS.

## **Brief presentation of the CzAeS:**

Czech Aeronautical Society (CzAeS) was founded on the 8th of May, 1990, as a non-governmental, non-political, non-profit making, scientific and technical professional association of individuals and corporate members focused in the field of aerospace sciences and technologies, in compliance with the Gathering Act No. 83/1990 of the Code of Law of the Czech Republic. Its Statute and Bylaws are registered at the Czech Interior Ministry. The activities of the CzAeS continue old traditions of gathering Czech aeronautical professionals, engineers and airmen, starting since the beginning of the 20th century.

## **Mission of the Czech Aeronautical Society**

The Czech Aeronautical Society is an unincorporated association in the field of engineering, science and technology, with individual and corporate members sharing their professional and personal interest in aviation and astronautics.





ODBORNÁ SPOLEČNOST LETECKÁ ČESKÉ REPUBLIKY  
CZECH AERONAUTICAL SOCIETY

The aim of the Association is above all to cater to the professional interests of its members and to attend to their professional and specialist development. The Association organizes various professional events focusing on dissemination of new information and knowledge among its members as well as the broader professional public; it publicizes the field of aviation among the broadest public and, above all, young people. The Czech Aeronautical Society represents its membership as a whole for individuals and groups, both national and international, particularly its counterpart aviation, aeronautical, space and other science and technology-oriented learned societies. As a founding member of the Czech Association of Scientific and Technical Societies it plays an active role in the work and activities of the Association, contributing to common professional science and technology policy. The Czech Aeronautical Society is an active member organization of the Czech National Committee for FEANI, participating in the activities of this European organization of professional engineers, contributing to the publicity and promoting professional qualification of high competence of the engineering profession in the field of aviation and space technologies. The Czech Aeronautical Society fully endorses the FEANI ethical codex of the engineering profession. It focuses its activities on assistance to secondary schools and technical universities in gaining young people's interest in studying various branches of aviation; this is achieved through organizing both popular and highly scientifically-oriented lectures on interesting and up-to-date topics. Also, lectures and discussions on history and meetings with World War II veterans are of significant influence; these events serve as an important means of preserving the nation's memory among young people, contributing towards the formation of the feelings of national pride and patriotism. The most significant individuals who contributed to democracy and freedom in the Czech Republic through their lifelong struggle against the Nazi and communist totalitarian regimes are honorary members of the Czech Aeronautical Society. The Czech Aeronautical Society provides a professional and social forum for its members; it publishes professional information in the mass media at home and abroad; it expresses its opinion on topical problems in the field of aviation and space technologies; it offers its professional services to state institutions and industry.

Dear Ms. Mercedes Oliver Herrero,

Thank you for your kind cooperation and help.

With my kind regards,

Assoc. Professor Dr. Ing. Daniel Hanus, EUR ING, AFAIAA  
President

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# THE BELGIAN VON KARMAN INSTITUTE: FUTURE ASSOCIATE MEMBER



**von KARMAN INSTITUTE FOR FLUID DYNAMICS** INPA  
 INSTITUT von KARMAN DE DYNAMIQUE DES FLUIDES AISBL  
 von KARMAN INSTITUUT VOOR STROMINGSDYNAMICA IVZW

REF. AGA001/JM/dl/243  
 14 December 2010

Mr. Pierre BESCOND  
 Chairman CEAS Board of Directors

Dear Mr. Chairman,

Following my mail with Dr. Szodruch, I hereby apply for membership as Associate Member of CEAS for the year 2011.

I confirm my endorsement of the CEAS statutes and any of their amendments as well as the CEAS by-laws.

I furthermore make the commitment to advance the purposes and endeavors of the CEAS.

Hoping that your General Assembly will be in a position to accept me as an Associate Member during 2011, I remain,

Yours Faithfully,

Jean MUYLAERT  
 Director

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 IDENTIFICATIE N° D'IDENTIFICATION: 749.57 IBAN: BE 572100 3153 3035





**INSTITUT von KARMAN DE DYNAMIQUE DES FLUIDES**  
**von KARMAN INSTITUTE FOR FLUID DYNAMICS**

**VON KARMAN INSTITUTE FOR FLUID DYNAMICS**

The von Karman Institute is a non-profit international scientific association founded in 1956. The Institute's mission is the advancement of the study and application of the science of fluid dynamics in the NATO countries. Fluid dynamics is the scientific field which deals with the motion of gases and liquids. The wide variety of applications range from the aerodynamics of aircraft to the flow of blood in the human body.

The von Karman Institute takes a distinctive approach to its mission. In contrast to traditional academic institutions, it provides *training in research, through research*.

The Institute's primary task is to train scientists and engineers from NATO countries in the field of fluid dynamics. Additionally, it disseminates knowledge in the field and promotes research in theoretical and experimental fluid dynamics, including numerical methods.

Success in these activities requires integrating research into the training programs, linking basic and applied research, developing research programs in line with the needs of industry and carrying out all these activities in an international forum.

At the Institute, education and research are conducted within three broad areas of fluid dynamics. These are reflected in the names of the departments:

- Aeronautics/Aerospace,
- Environmental and Applied Fluid Dynamics,
- Turbomachinery.

In addition, the Numerical Simulation Unit promotes interdepartmental collaboration in computational fluid dynamics.



## THE AAAR, FUTURE ASSOCIATE MEMBER



## ROMANIAN AERONAUTICAL & ASTRONAUTICAL ASSOCIATION

LETTER OF INTENT

30<sup>th</sup> September, 2010

In attention : **Prof. Dr. Eng. Jan DELFS, CEAS-ASC President**

Dear Mr. President,


As you probably know, in our country was formed a professional association, centered on aeronautics and astronautics and related issues. This association, named **Romanian Aeronautical and Astronautical Association - AAAR**, groups most of the Romanian aircraft engineers, located in Romania, Europe and North America.

Being now a part of Europe, we consider as appropriate the involvement of Romanian **AAAR** in the prestigious european professional confederation.


This letter is to underline the firm intention of **Romanian Aeronautical and Astronautical Association AAAR** to become a full member of the Confederation of European Aerospace Societies, a normal situation for a country with research and industrial capability in the fields of aeronautics and astronautics.

Yours sincerely,

President  
 Prof. Dr. Doc. Eng.  
**Virgil STANCIU**



Vicepresident,  
 International Relations,  
 Dr. Eng.  
**Valentin SILIVESTRU**



## CEAS ANNUAL REPORT 2010



By Joachim Szodruich

“ This year was filled with intensive work in many areas and to start with we can be very grateful for the many highly engaged and enthusiastic colleagues we have in the Board of CEAS. They all have worked hard to bring our society forward and to achieve the goals we have set ourselves at the beginning of this year. Of course also all of the active members from the all our societies have contributed to the success of 2010 in their specific field. Thank you all for this great achievement! We strengthened our position of being the only general Aeronautics and Space Society in Europe. On 17th December 2009 in Brussels, I was re-elected as President continuing the programme established by the former Trustees under his leadership.

Board meetings during the year 2010 have taken place at the NLR in Amsterdam (23 April), in Hamburg during the DGLR Annual Conference (2 September) and in the DLR offices in Brussels (2 December). We are very grateful to the local hosts of all the CEAS Board meetings. We had an excellent reception at all the various places. This year again we have seen a number of changes in the Board and all the outgoing representatives devoted quite some time and effort to CEAS. The following changes occurred:

There was a discussion initiated by the President concerning the role and future position of the Branch Chiefs. It was concluded that we urgently need these two positions for organising the technical work efficiently across Europe. Thus at the Amsterdam meeting Joachim Szodruich resigned as the interim Branch Chief Aeronautics. He gave an update on the status of the Branch and was happy to report that Christophe Hermans was ready to take over this position. The Board of Trustees agreed unanimously to appoint Christophe Hermans Chairman of CEAS Aeronautics Branch.

With the changes in the Spanish Society we also had to appoint a new Vice-President Finance. Pierre Bescond volunteered for this position and the Board unanimously approved his appointment. In order to ease the handling of our accounts the Board unanimously appointed Mercedes Oliver as the new Finance Manager a position newly formed which will greatly improve the efficiency of our operation in the hands of the General Director. All necessary

changes with the bank account have been successfully completed as well.

After forming a new Programme Coordination Committee (PCC), we were informed at the Amsterdam meeting that this group has taken now all the necessary steps in membership and tools to be used to work efficiently in the future. François Gayet was appointed Chairman of the PCC, he will be assisted by Jean-Pierre Sanfourche as Executive Secretary. These nominations were unanimously approved by the Board.

The President thanked all newly appointed members for their willingness to serve CEAS and wished them good luck and success in the new position. Furthermore it needs to be mentioned that the former VP Finance Antonio Martin-Carrillo Dominguez contributed greatly to the CEAS goals and successes. The President and all the Trustees thanked him for his intensive and engaged work.

The Board meeting of 2<sup>nd</sup> December 2010 in Brussels was preceded by the 5<sup>th</sup> General Assembly meeting and a number of changes in the Board of Trustees membership occurred. The admission of the Polish Society as full Member of the CEAS was unanimously approved, as well as the admission of the Czech Aerospace Society as Associate Member.

One of the major goals in 2010 was the successful introduction of our more political influenced bi-annual conference series, here the CEAS conference “Aerospace for Europe – more than just flying” in Brussels on 1st and 2nd of December. From the start this was arranged in cooperation with ASD and was embedded in a larger action of ASD, the “Aeroweek” in the European Parliament. [...]

Other European Conferences were performed successfully as well. As one of the annual events the 38th European Rotorcraft Forum (ERF) was held in September in Paris. Again it demonstrated that the ERF is one of the premier events in the industry’s calendar bringing together manufacturers, research establishments, academia, operators and regulatory agencies to discuss advances in research, development, design, manufacturing, testing and operation of rotorcraft. The Board decided to support this event with sponsoring the Cheeseman Award which is now a dedicated plaque with inscriptions, containing both CEAS and ERF logo’s.

In June the 16<sup>th</sup> AIAA / CEAS Aeroacoustics Conference was held in Stockholm. This conference as well has established itself as the premier international forum for the field of aeroacoustics. It offers scientists and engineers from industry, government, and universities an exceptional opportunity to exchange knowledge and results from current studies and to discuss directions for future research. Also for the first time it was decided by the Board that CEAS is sponsoring the best student paper with a monetary award.

As part of improving the overall conference programme CEAS also supports the initiation of new conferences. The Board was informed by Prof. Florian Holzzapfel about the 1<sup>st</sup> CEAS Specialist Conference on Guidance, Navigation and Control to be hosted by DGLR in Munich in April 2011. Most of the CEAS countries are represented in the International Technical Committee.

Due to our commitment and discussions with the European Commission the planned 'Aerodays' conference on 30-31 March and 1<sup>st</sup> April 2011 will be supported by CEAS. Two events are planned: a European student competition as well as a local (Madrid) organised paper flying competition with school kids.

Finally the 2011 CEAS Air and Space conference will be held in Venice. Two excellent proposals from the Swedish and the Italian societies were presented and in a very close vote we decided for Venice. Thanks again to all who were involved and we all agreed to consider Sweden for the next conference.

Another goal was to start this year a new era for scientific publications in the field of aeronautics and the air transport system as well as for space. The Aeronautical and the Space Journal are collecting papers for the two CEAS Journals. The process was slow and we all need to support the launch of these important Journals by an even more intensive communication of all the member societies.

Again this year we saw an impressive improvement and an increase in the interest in our CEAS Bulletin. We continue the distribution towards representatives from the European Commission, European Parliament, European professional organisations, research and industry in general.

Our cooperation with other countries or organisation will be further strengthened by the proposed MoU between CEAS and the European Association for Aviation Psychology (EAAP). The MoU is supposed to be signed in the Brussel meeting in December.

In summary 2010 was quite a successful year for CEAS. Unfortunately not everything could be mentioned in this report but every little detail of work was of importance to our progress. Based on the goals set by the President we can conclude :

- The preparation by ASD / DGLR of the CEAS 2010 political Conference in Brussels was excellent and engaged also thanks to all supporting societies. Now we only can hope to have started successfully our new bi-annual strategy and policy conference.
- The publication of two new Aeronautical and Space Journals by the end of this year has been not been reached, however we came actually very close as the first issues should appear soon.

- Concerning our young people activities we started discussions with Euroavia and we will support students for the CEAS conference in Brussels as well as for the Aerodays 2011.
- We did fill our empty positions notably the new Branch Chief for Aeronautics and the VP Finance.
- We enlarged our perimeter by adding new European Aerospace Societies to our CEAS Membership.
- We successfully started the preparation for new conferences.

Those of you who are heavily engaged in CEAS and also the supporting members of CEAS, we all can be proud of what has been achieved so far. This is a result of our common efforts as well as your personal achievements and I would like to thank you all for that."

**Joachim Szodruch**  
**President of CEAS in 2010**



## PIERRE BESCOND INTERVIEW



**Jean-Pierre Sanfourche interviewed Mr Pierre Bescond, the new CEAS President**

J.-P. S.: You joined the CEAS Management Board in October 2009 at the time of the CEAS European Air & Space Conference held in Manchester, i. e. one and a half year ago: how do you perceive our

Association, generally speaking?

**P.B.:** True, I was new to this organisation when for the first time I attended the CEAS Board of Trustees on the 28<sup>th</sup> of October 2009 in Manchester. Therefore I had no preconceived idea about it, except perhaps a slight favourable opinion because I am one of those who are convinced Europe is the way to go.

I must say I was impressed by the structured CEAS management, by the clear sharing of responsibilities, and also by the way all trustees allowed their President Dr Szodruich to very professionally and efficiently lead the discussions and the decision making process. It is with the greatest pleasure that I noticed the excellent team spirit around the table, each and every trustee very intentionally and significantly contributing to the emergence of our young Council. I remember saying to myself: "Here we do have a wonderful tool to help develop an excellent collaboration between the National Aerospace Societies".

I wish to seize the opportunity of this interview to express my gratitude to the people who built up this organisation and to address my predecessor Dr Joachim Szodruich my warmest thanks for the remarkable impulse he gave.

After this first contact, I actively attended the various CEAS meetings and events. They allowed me to naturally sharpen my judgment. Although I do confirm the statements I made earlier, to me it clearly appears necessary that we more precisely define and describe the fundamental mission and goals of CEAS and we more accurately set its scope. Simply and clearly said, how do we better serve the Member Societies, what added value do we bring them? As a matter of fact, some basic questions we must try to answer are the following:

- How do we effectively and efficiently help the Member Societies in their development of fruitful collaboration plans? (complementarity)
- What can only be offered by CEAS (the "principle of subsidiarity")?
- Can we facilitate the initiation of powerful synergies and how?

J.-P.S.: In your opinion, the CEAS should not try to replace the national associations, but on the contrary should support national initiatives in developing synergies at a European level. Do I correctly understand you?

**P.B.:** Exactly so. The CEAS actions have to be conceived and then implemented from a confederation's rather than from a federation's perspective. In analogy with chemistry,

I would say that CEAS has to play a catalytic role: the catalyst does not appear in the equation of the chemical reaction, but it facilitates it and in certain cases, without it the reaction would not take place. CEAS can also act as an amplifier of communications and co-operative actions between the Member Societies. We never must interfere with them, but I'm sure we can help extend the perimeter of their action in the European context. We also possibly may foster bi-lateral co-operation on some specific subjects.

J.-P.S.: What are the basic tools you plan to use for developing communication between the Members?

**P.B.:** The CEAS Quarterly Bulletin for the development of which you are conducting an intensive and very appreciated work, the Programme Coordination Committee (PCC) chaired by François Gayet, and the CEAS Web Site currently being redesigned by our Director General Mercedes Oliver. Those three tools should be strongly activated, and in addition, we should increase the opportunities of direct contacts.

J.-P.S.: What lessons did you learn from the Manchester Conference, our latest CEAS European Air & Space Conference?

**P.B.:** This event was remarkably well organised by the Royal Aeronautical Society (RAeS), all presentations were of high standing and there also was the launch of EYAP (European Young Aerospace Professionals), quite an important initiative. But I was very disappointed when I discovered the extremely low proportion of non-UK delegates and the insufficient number of non-UK presentations. The CEAS contribution obviously was way below RAeS expectations and it perfectly illustrates what I said before: our catalytic role was too weak! Well, we are on a learning curve and it is essential to define appropriate ways to do much better in the future.

J.-P.S.: Do you already have any suggestions in mind?

**P.B.:** No definite suggestions, I must confess. If it were easy we would already have done it. We may well have to go through a trial and error process. I do expect that the trustees as always will make interesting proposals. Perhaps we will have to set up a brainstorming group in charge, through a multinational approach, of elaborating proposals for practical and effective solutions. Presently the only thing I can tell you is "yes we should do better, yes we can, and yes we will!"

J.-P.S.: DGLR is organising a Technical Conference on a single and specific topic "Guidance, Navigation and Control": this Conference called "CEAS GNC 2011" will take place in Munich this April. What do you think about this initiative?

**P.B.:** I think it is a superb initiative and we must strongly encourage the development of such conferences, for the following reasons:

- Organised under the aegis of CEAS, co-badged, as my

British friends would say, by DGLR and CEAS, this conference will benefit from a wider panel of experts.

- The themes dealt with will be approached from a European perspective.
- Concentrated on one topic only, the attendance will be homogeneous and much better motivated because all delegates will be “GNC” experts.

It is my conviction that this event is a line to be followed in the future. We should further promote this excellent concept of “double-badged” technical conferences (CEAS + the proposing National Association at the helm).

**J.-P.S.:** *Conversely, do you consider that to choose a Conference central theme covering too broad a spectrum constitutes an additional obstacle towards success?*

**P.B.:** I fear so. When we prepare a “general” aerospace conference, it is absolutely necessary to carefully set the limits of its perimeter by precisely answering the following questions: What are the objectives? What is the target attendance? Does the foreseen central subject correspond to a high level shared concern or interest? Is it the best time to deal with the matter?

The better your scope is defined and fitted, the better your chances are to succeed: but I recognize that it is easier said than done...

**J.-P.S.:** *The above-mentioned GNC Conference is being organised with a close co-operation with the GNC Group of the AIAA (American Institute of Aeronautics and Astronautics), are you in favour of that?*

**P.B.:** Not only am I in favour of it, but I strongly encourage the European Conference organisers to establish close links with AIAA. A Memorandum of Understanding exists between AIAA and CEAS, let’s make use of it, let’s open our windows! This in turn will help Europe better balance its presence and image with AIAA. And I’m sure our American colleagues will benefit from it too.

**J.-P.S.:** *As regards the CEAS Strategy and Public Policy Conferences, it is not easy to focus on one single specific topic because when talking about policy, it is unavoidable to cover a wide domain of issues? How to proceed to successfully manage such events?*

**P.B.:** This is a difficult question: success or failure is built-in as early as the initial conception of the conference. Since CEAS still is at the beginning of its operational life, I would recommend that we undertake this programme of Conferences by choosing specific and limited subjects. One example I have in mind is:

*“Aerospace Education and Training in Europe”.*

The high interest of the subject is unquestionable, the players are perfectly identified: academia, industry, the European Commission. And what is more important than youth to prepare for the future?

**J.-P.S.:** *The Belgian von Karman Fluid Mechanics Institute and the Romanian Aerospace Association are candidates for member admission at the upcoming CEAS Board*

*Meeting on the 31<sup>st</sup> of March as Associate Members. Could you comment on that?*

**P.B.:** Firstly, and subject to a favourable vote (but I bet it will be), I will be delighted to welcome these two new associations, and we shall do our best to give a good response to their expectations.

Secondly, I observe that starting from 8 in 2005, CEAS now counts 16 members, which obviously demonstrates that it corresponds to a need or at least a desire and that the Officers of the Board are working in the right direction.

Thirdly, it is my intention to support the continuation of this growth, although it must not go too fast. While in actual fact we follow the general line of development of the European Union, we are bringing additional wealth to it by bringing so many varied organisations into a joint effort: big and smaller associations will work together, more recently born associations will join the oldest and most prestigious ones (RAeS has been in existence for 145 years while we will be celebrating the 100th anniversary of DGLR next year!) in an unprecedented move for our aerospace societies.

**J.-P.S.:** *Have you already assigned yourself some top priorities?*

**P.B.:** Yes I have: (1) more precisely define how to work with the Member Societies, possibly with some brainstorming of a working group; (2) by the end of this year propose to the Board of Trustees any necessary adaptation of our organisation; (3) if the Board of Trustees agrees, undertake the preparation of a Conference dedicated to the “Aerospace Education and Training in Europe”.

No need to say, these initiatives will be undertaken in a spirit of “improvement and continuity”: there is no need to break anything, but we must make good use of all lessons learnt.

As a final word, let me again say how much I am indebted to Dr Szodruch, his predecessors and all the persons who led the way. To them all I want to reiterate my thanks and my congratulations.

## PIERRE BESCOND

Mr Pierre Bescond graduated from Ecole Polytechnique (X63), Supaero, Ecole de l’Air and IHEDN. Ingénieur général de l’Armement, he currently acts as a senior expert in space, quality, defence, security, and international relations for various organizations and boards of directors. After 10 years in France and in the UK working on the aircraft and missiles national and international French Defence Ministry programmes he devoted his time to space activities where he held high level responsibility government positions such as Managing Director of the Guiana Space Center at the time of the Ariane launcher qualification, Director of Programmes in the French Space Agency (CNES), chairman of the European Space Agency (ESA) Joint Communications Board, and Advisor on space, defence and security issues for the French Minister in charge of Space. He also led space private ventures as President of Spot Image Corporation in the USA and of other commercial subsidiaries of CNES.

## PERSONALITY INTERVIEW

Jean-Pierre Sanfourche has interviewed Mr Patrick Goudou, Executive Director of the European Aviation Safety Agency (EASA)



Patrick Goudou, EASA  
Executive Director

**1. The Annual Safety Review concerning the Year 2010 is in course of preparation, could you indicate in a general manner the main tendencies which will emerge in comparison with the Year 2009?**

For the first time in over 40 years there was no fatal accident in European commercial air transport operations (fixed-wing) in 2010. However a good year for Europe was poor for civil aviation worldwide.

Sadly the number of fatal accidents worldwide in this category has increased to 52 from 39 in the previous year, based on unconfirmed data. In addition the number of fatalities has increased over the previous year.

Looking back over the decades it is possible to see a progressive reduction in the world-wide accident rate. However this hasn't happened over the last five years as a growth in traffic has seen a growth in the number of accidents.

To tackle this situation action on the big safety issues, like loss of control and runway safety is an imperative. To make lasting improvements there is a practical necessity to implement safety management and integrate new technologies. For helicopters the good news for Europe is that commercial air transport operations involving helicopters over 2250 kg MTOM had no fatal accidents in 2010.

**2. The decision to conduct a fourth search phase aiming at localizing the wreckage of the Rio-Paris Aircraft (Flight AF447, 1 June 2009) has been recently taken by the French Transport Ministry: will the EASA be associated to this campaign?**

A close working relationship has been maintained with BEA France and the parties to the process though the whole process of this on-going fatal accident investigation. That will continue.

The new European legislation on accident investigation formalises the Agency's role with respect to this process.

If the search is fortunate enough to discover the flight recorders the Agency has the expertise to help make sense of the records that may be uncovered.

**3. The volcanic ash crisis of April 2010 created a lot of unexpected problems in the European Air Traffic: the EASA has deeply reviewed the data with a view to establishing a new European approach which would allow alleviating the**

precaution measures. What are the essential conclusions from the Volcanic Ash Operations Workshop held in Cologne in last January?

Do you think it will be possible to define firm airworthiness criteria in volcanic ash conditions thanks to which disruption of air traffic could be avoided?

This is a multi disciplinary problem where airworthiness is one component in the solution. EASA continues to work with the engine and airframe manufacturers to define realistic requirements for the future.

We work in the ICAO Task Force to ensure that solutions will be internationally acceptable.

<http://easa.europa.eu/conferences/vaow/>

**4. The European Strategic Safety Initiative (ESSI) was launched by EASA in June 2006 as a ten-year programme. We are presently in the middle of its development: what are in your opinion the most important progresses achieved so far in each of the three sectors concerned – commercial aviation (ECAST), helicopter (EHEST) and general aviation (EGAST)?**

**What are the priority holder actions to be carried out now?**

The **European Strategic Safety Initiative (ESSI)** is a voluntary, privately funded and non-legally binding aviation safety partnership aiming to further enhance aviation safety in Europe and for citizens worldwide. Facilitated but not owned by the European Aviation Safety Agency (EASA), it brings together aviation authorities, operators, manufacturers, associations, professional organisations, research laboratories, EUROCONTROL, and international partners like ICAO and the Federal Aviation Administration (FAA).

Created in 2006, the ESSI has three components: the European Commercial Aviation Safety Team (ECAST), the European Helicopter Safety Team (EHEST), and the European General Aviation Safety Team (EGAST).

Progress of the initiatives are regularly presented in international such as The International Air Safety Seminar (IASS) and the European Aviation Safety Seminar (EASS) by FSF, and the EASA Rotorcraft Safety Symposium.

The ESSI is recognised by ICAO as a Regional Aviation Safety Group (RASG).

**ECAST** is the fixed-wing Commercial Air Transport component of ESSI. Launched in October 2006, it counts more than 75 organisations and is co-chaired by EASA and IATA. Current ECAST activities address Safety Management Systems (SMS) and Safety Culture, Ground Safety, and Runway Safety. Runway safety activity includes cooperation with EUROCONTROL. The ECAST GS WG cooperates with IATA and encourages adoption in Europe of the ISAGO and IGOM programmes.

ECAST cooperates with United States CAST and other major safety initiatives worldwide such as COSCAP by ICAO, the Safety Audit Programme for Ground Operations (ISAGO) by IATA, and the United Kingdom Ground



Handling Operations Safety Team (GHOST).

**EHEST** is the helicopter component of ESSI. Co-chaired by EASA, Eurocopter, and the European Helicopter Operators Committee (EHOC), the EHEST counts more than 50 participating organisations.

EHEST is also the European component of the International Helicopter Safety Team (IHST), a United States-based combined government and industry effort launched in 2005 to reduce the helicopter accident rates by 80 per cent by 2016 worldwide. IHST now counts several regional teams worldwide. Direct cooperation has been established between the EHEST and the Gulf Helicopter Safety Team in 2011.

EHEST has published in 2010 an Analysis Report of 311 helicopter accidents occurred in Europe between 2000 and 2005 for which final investigation reports from accident investigation boards were available. To tackle the variety of languages used in accident reports and optimise resource use, nine regional teams have been established across Europe. Regional analyses are then consolidated at European level.

The top three areas identified from the analysis are "Pilot judgement and actions", "Safety Management and Safety Culture", and "Pilot situation awareness".

There is no intention to incriminate the pilots, here: pilots actually are the last line of defence against accidents.

Different patterns and accident scenarios were observed for Commercial Air Transport, Aerial Work and General Aviation.

Three implementation teams were created to address Operations and SMS, Training, and Regulatory aspects.

The EHEST also counts a Communication team to promote the initiative and its deliverables especially towards small operators and the General Aviation community.

The EHEST also supports the development in 2010 of a helicopter version of the International Standard for Business Aircraft Operations (IS-BAO).

In parallel, IHST has developed a series of publicly available 'Toolkits' addressing SMS, Risk Assessment, Training, and Helicopter Flight Data Monitoring (HFDM). A fifth toolkit on Maintenance has been developed by the EHEST and will soon be published by the IHST.

**EGAST** is the third component of the ESSI addressing General Aviation.

It responds to the need for a coordinated effort to improve general aviation safety in Europe.

EGAST is co-chaired by EASA, the European Airshow Council (EAC) and the European Council for General Aviation Support (ECOGAS) and counts more than 50 organisations.

EGAST got organised around four main activities: safety promotion (development of subject specific safety leaflets and videos), data collection and analysis, proactive safety (addressing today the risks of tomorrow), and link between

research and the general aviation community (identification of needs and promotion of results).

At international level, EGAST cooperates with the United Kingdom CAA, the Institut pour l'Amélioration de la Sécurité Aérienne (IASA), France, the FAA Safety Team (FAAST) and the Aircraft Electronics Association (AEA) in the United States, and the Transport Canada Civil Aviation Directorate (TCCA).

*ESSI way forward:*

ESSI action is now intergrated in the European Aviation Safety Programme (EASP).

The EASP system contains three elements: a Strategy, a Programme, and a Plan.

The Plan identifies safety actions to be addressed at European level in complement to the MS State Safety Programs. Together with the SSPs, the EASP form the European answer to the ICAO requirements on State Safety Programme.

'Safety Initiatives' is also a core process in the EASA Quality Management System.

The ESSI therefore is now managed in compliance with the ISO 9001:2008 requirements.

<http://www.easa.europa.eu/essi/>

## 5. How is EASA co-operating with the Flight Safety Foundation (FSF)?

- EASA is a regular speaker in the European Aviation Safety Symposium and International Aviation Safety Symposium.

- FSF is a partner of the European Commercial Aviation Safety Team ECAST, which is facilitated by EASA as part of the ESSI.

- The ECAST GS WG, also called the European Working Group for the Prevention of Runway Excursions (EWG-PRE), led by Eurocontrol, integrates among other safety material developed by the FSF. <http://flightsafety.org/current-safety-initiatives/runway-safety-initiative-rsi/runway-excursion-risk-reduction-rerr-toolkit>

- Note: EASA is considering appointing a member on the FSF European Committee chaired by Eurocontrol. Several members of ECAST sit on this Committee.

## 6. The handling of the Safety Recommendations is a very heavy work: could you briefly describe the way in which you are organised? Are you sufficiently staffed?

We have a group of 2 people in the Safety Analysis and Research Department. The recent implementation of Regulation (EU) 996/2010 as well as the extension of the Agency's remit both contribute to a constant increase of safety investigations and recommendations that are addressed to EASA (92 in 2010). The recommendation group disseminates all incoming recommendations to the various experts involved and coordinate a reply on behalf of the Agency taking the best of each individual knowledge for a collective result.

7. On 8 and 9 September 2010, EASA hosted the International Air Safety & Climate Change Conference: could you summarize in a few words the outcome of this event and the main resulting recommendations?

- Firstly, we have learned about the limitations of current modeling. New ideas to detect ash need to be further investigated including satellite imagery, monitoring of sulfur dioxide (SO<sub>2</sub>) levels and the use of unmanned aerial vehicles. We also need better modelling with more precise locations and levels, while consolidating the modelling with measurements from ground and airborne data sources.

- ▶ We also need more communication and data exchange. It is crucially important to get the right data, to the right person, in the right format, at the right time!

- Secondly, we asked what would happen if there was another volcanic eruption:

- ▶ In the near future, the same system would be in place with decisions by the authorities, but with better coordination thanks to the European Aviation Crisis Coordination Cell and better networking of all actors involved.

- ▶ In the more distance future, the decision point may move from the Authorities to the operators, if – and only if – opera-

tors have the means to answer the three following questions:

1. How much ash there is and where it is.
2. What the effect is of that level of ash on engines and airframes.

How operators can make decisions in a traceable and transparent manner (risk based decision making)

7. What is your view about the way in which SESAR (Single European Sky ATM Research) is progressing and what are your hopes in terms of safety increase at the time when the overall system will be operational? What are possible apprehensions?

Complex highly integrated system, like SESAR will require sophisticated methods to be able to perform sound safety assessments. Attention needs be given to developing and improving practical methods. The Agency is fully committed to play a key role in the Architecture of the system.

9. What are your major wishes for EASA in 2011?

The European Aviation Safety Agency will continue to ensure it is recognised as an independent expert and trusted body for aviation safety in Europe. The organisation is fully dedicated to promoting the highest safety standards in aviation.

## A NEW PHASE OF RESEARCHES FOR THE WRECKAGE OF THE AF447 RIO-PARIS FLIGHT

On Friday 4 February 2011, Thierry Mariani, secrétaire d'Etat chargé des Transports (France), and Jean-Paul Troadec, Director of the BEA (Bureau d'Enquêtes et d'Analyses, DGAC, France) met the associations of the flight AF447 victims' families. They officially announced the deci-

sion to undertake a new phase of researches for the wreckage of the Airbus A330-203 that disappeared in the sea off the Brazilian coast in the night of 31 May to 1<sup>st</sup> June 2009. This announcement was made in presence of the U.S.-based Woods Hole Oceanographic Institution (WHOI), which

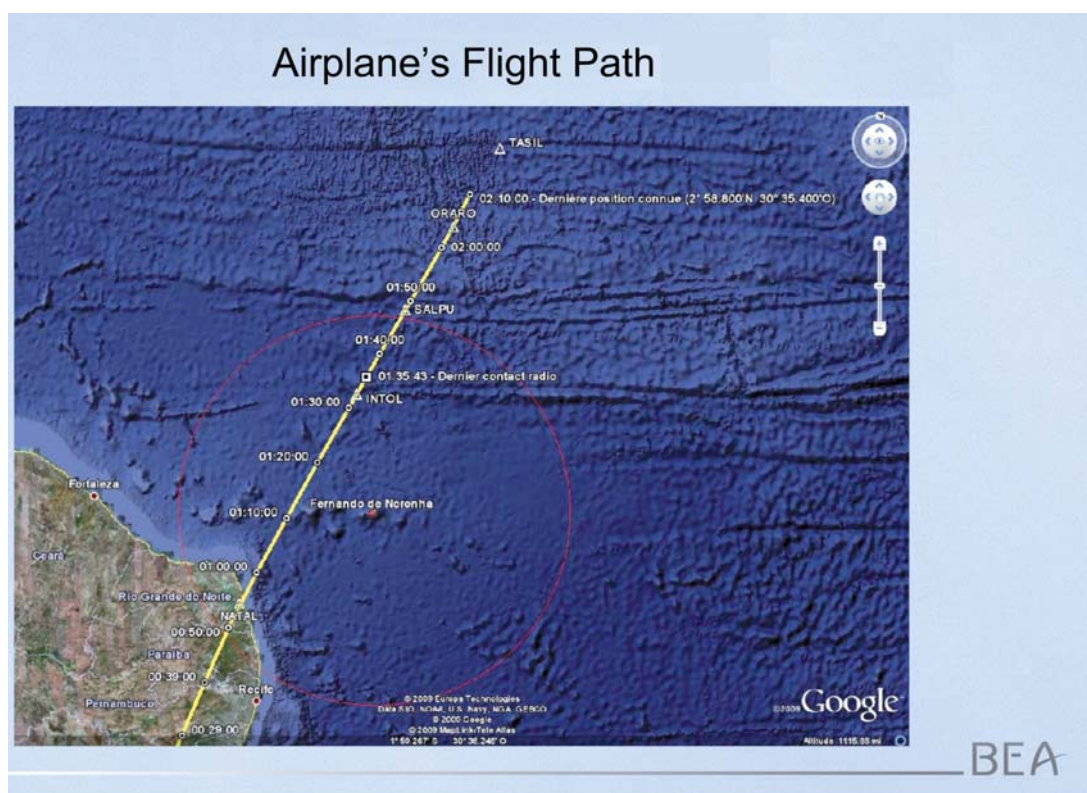


Fig.1: After 01:35:43, there was no further contact with the crew.

will conduct under BEA's control, from March to July 2011, this new undersea search campaign called "PHASE 4".

The present article recalls the history of the tragedy, gives an overview of the previous sea searches (phases 1, 2 and 3) and briefly describes the phase 4 research.

## HISTORICAL RECALL

On Sunday 31 May 2009, the Airbus A330-203 registered F-GZCP operated by Air France was programmed to perform scheduled flight AF447 between Rio de Janeiro Galeao and Paris CDG. Twelve crew members (3 flight crew, 9 cabin's crew) and 216 passengers were on board. Takeoff took place at 22h 29. The takeoff weight was 232.8 t (for MTOW of 233 t), including 70.4 t of fuel.

The crew contacted, successively:

- Rio de Janeiro approach control;
- Curitiba ATC centre, which cleared it to climb to FL350 at 22h 45min 26;
- Brasilia ATC centre at 22h 55min 41;
- Recife ATC centre at 23h 19min 27, the airplane being stable at FL350;
- Atlantico ATC centre on HF at 1h 33min 25.

At 1h 35min 15, the crew informed the Atlantico controller that they had passed the INTOL point then announced the following estimated times: SALPU at 1h 48 then ORARO at 2h 00 (INTOL, SALPU and ORARO are civil aviation reporting points). They also transmitted their SELCAL (SElective CALLing system) code and a test was performed.

At 1h 35min 46, the controller asked them to maintain FL350 and to give their estimated time at the TASIL point. Between 1h 35min 53 and 1h 36min 14, the controller asked the crew three times for its estimate at the TASIL point. There was no further contact with the crew (figure 1). The factual elements relating to the history of the fight are limited to the maintenance and position messages transmitted by the ACARS (Aircraft Communications Addressing and Reporting System). The maintenance messages transmitted in the last few moments of the flight brought to light a loss of speed information, very likely linked to a blocking of the Pitot tubes by ice crystal, which led to the loss of some automated systems. But these elements are not sufficient to explain the catastrophe.

Finding the wreckage and reading out the flight recorders remain the key to any possible understanding of the circumstances and causes of the crash and thus to any safety lessons that may be drawn to prevent any recurrence.

## SEA SEARCHES CONDUCTED BETWEEN JUNE 2009 AND MAY 2010

As soon as the alert was raised on 1st June, significant air and naval resources were mobilised to try to find some trace of the airplane and any possible survivors. It was only 5 days later, and during the following days, that bodies and floating debris were found drifting on the surface of the sea, north of the last known position automatically transmitted by the airplane, a little less than 5 minutes before the impact.

On 10 June 2009, a first undersea search operation began, with the aim to detect the acoustic signals that should be

transmitted, for a certified period of 30 days, by beacons attached to airplane's flight recorders. These searches were undertaken using receivers lent by the US Navy, towed by surface vessels, and a receiver on board a French Navy submarine. The acoustic searches were brought to an end on 10 July 2009.

From 27 July to 17 August 2009, a new attempt to localise the wreckage was conducted with the aid of sonar on board

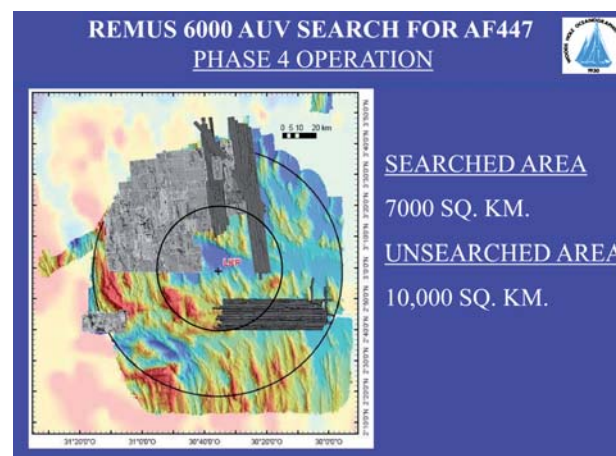


Figure 2: REMUS 6000 AUV Search for AF447: the search area of phase 4.

an IFREMER vessel. This operation was also unsuccessful. In August 2009, the BEA defined a new strategy to operate in a particularly difficult environment: vast search zone (17,000 km<sup>2</sup>), sea depths going down as far as 4,300 m, very rough sea bed, currents not well known. So, a study was undertaken in order to model the sea currents so as to estimate the drift of the recovered debris: this work, performed by a group of experts from 11 oceanographic institutes and organisations (France, Russia, UK, USA) resulted in the definition of a reduced area of about 2,000 km<sup>2</sup> in which the wreckage should be located with a high degree of probability.

The 3<sup>rd</sup> search campaign was launched on 29 March on the basis of this hypothesis. Based on two vessels – one



Figure 3: REMUS 600 AUV dimensions.

equipped with REMUS autonomous underwater vehicles (AUV) and means for observation and lifting, the other equipped with towed sonar) – it was performed in 2 stages:



April and May 2010. An area of 6,000 km<sup>2</sup> was covered: the initial zone of 2,000 km<sup>2</sup> + adjacent zones. This campaign came to an end without having detected the wreckage of the airplane:

- Did the resources used make it possible to localise the wreckage?
- Were the zones explored included the ones that might contain the wreckage?

### NEW UNDERSEA SEARCH CAMPAIGN

This campaign is based on the strategy of systematically searching all the zones that have not been covered yet, by means of sonar underwater imagery. A systematic survey of a large area - about 10,000 km<sup>2</sup> - (figure 2) will be performed between mid-March and July 2011. It will begin in the 20 nautical mile circle centred on the last known position. Three REMUS AUVs will be used (figure 3).

Two phases are foreseen: (i) a localisation phase (phase 4) financed by the industry; (ii) a phase of detailed observation and recovery if the wreckage is discovered (phase 5), financed by the French State. The whole operation has been placed under the operational responsibility of the US-based Woods Hole Oceanographic Institution (WHOI), which already participated in the previous campaign.

The undersea equipment selected for phase 4 includes the two REMUS 6000 AUV from the Waitt institute and one REMUS 6000 AUV from the German Geomar oceanogra-

phic institute. Three search stages will take place, of 36 days each: 30 days in the search zone + 6 days transit for port calls in Brazil. Phase 4 will come to an end upon detection and identification of the wreckage, at the latest in the end of July.

If the wreckage is found, the BEA will immediately launch phase 5 for detailed observation and recovery.

### SEVERAL SAFETY RECOMMENDATIONS HAVE BEEN ALREADY ISSUED

The BEA has been able to express a number of safety recommendations:

- a recommendation aimed at better defining the conditions that could be encountered in clouds at high altitude and consequently reviewing the certification criteria, in particular those of Pitot tubes (the European Aviation safety Agency is undertaking the corresponding research);
- a series of recommendations intended to ensure rapid localisation of the wreckage of an airplane involved in an accident over the high seas: regular transmission of basic parameters that would allow the wreckage to be localised within a radius of 4 nautical miles (7 km), extension from 30 days to 90 days the operating (transmission) time for beacons, ...

*From information provided by BEA  
[www.bea.aero](http://www.bea.aero)*

## SAMTECH AND THE AEROSPACE TRADITION AROUND THE UNIVERSITY OF LIEGE



By **Didier Granville**, Chief Strategy Officer, SAMTECH



### About Pr Baudouin Fraeijs de Veubeke

The history of Samtech started in 1955 when Baudouin Fraeijs de Veubeke, aeronautical engineer at FAIREY Aircraft Industries (today known as SONACA), and then at the Belgian Aeronautical Administration, was appointed to the chair of Aerospace Engineering and Continuum Mechanics at University of Liège. He created the « Laboratoire d'Aéronautique » of University of Liège that was renamed a little bit later into « Laboratoire de Techniques Aéronautiques et Spatiales », known in the world under the acronym LTAS. He acted at the same time

as a Professor in the Department of Applied Mechanics of the University of Louvain. He was also a Visiting Professor at M.I.T. Massachusetts in 1952 and at Stanford University, California in 1955.

Many honours were bestowed upon Professor Fraeijs de Veubeke in recognition of his considerable scientific activity, including his election as a full member of the Belgian Academy of Sciences in 1976, two months before his untimely death. Such an election is rare in engineering and represents an acknowledgement of the scientific rigor of his work. Indeed, his contributions to various disciplines such as unsteady aerodynamics, elasticity, structural mechanics, theory of vibrations and optimal control were significant and original. They bear the stamp of an incisive and penetrating mind, and all are of lasting value.

Although his main interest lays in research, he was active in several of the international agencies devoted to co-operation in aeronautics and astronautics. In particular, he was a founder member of the Structures and Materials Panel of the Advisory Group for Aeronautical Research and Development (AGARD). He also took a very active part in the constitution of ELDO, from which the present European Space Agency (ESA) has originated.

Professor Fraeijs de Veubeke's activity took place essentially at University of Liège, where he was he major driving

force in the Department of Aerospace Engineering for more than 20 years.

### TOWARDS THE FINITE ELEMENT ANALYSIS (FEA): THE ROLE OF GUY SANDER

Around him, a group of researchers rapidly grew who shared his faith in research and helped in developing his pioneering work, mainly numerical methods for structural analysis. This work that contributed to the foundations of the Finite Element Method (FEM) was based on the application of variational principles and their finite element discretization. From 1961, Pr Fraeijs de Veubeke was assisted by a young researcher called Guy Sander, who was not only a competent engineer and scientist but also an entrepreneur. Guy Sander realized very quickly that the SAMCEF Finite Element Analysis (FEA) software developed at LTAS in the frame of PhD theses could interest the Belgian but also the French aerospace industry. In Belgium, SABCA confirmed this interest followed soon by SONACA. In France, the famous "Centre National d'Etudes Spatiales" (CNES) and the "Avions Marcel Dassault" were the first big customers of LTAS, just before 1970. In 1971 followed SNIAS (later renamed "AEROSPATIALE" that is now EADS), starting first with Bordeaux (now ASTRIUM Space Transportation) and continuing with others in particular with the one of Toulouse which became part of AIRBUS later and the one of Suresnes which is now part of EADS Innovation Works. At that time, the European Propulsion Company (Société Européenne de propulsion: SEP) and SNECMA, now parts of SAFRAN Group were also customers of LTAS. Many others (GIAT in particular) followed in various sectors of mechanical engineering.

### FROM THE LTAS TO SAMTECH

On 19 September 1986, ten years after the death of Pr Fraeijs de Veubeke, Guy Sander decided to concretize the idea of creating a professional organisation able to manage such a growth outside the University of Liège. It was the beginning of SAMTECH, one of the first "spin-off" of University of Liège, lead Eric Carnoy as General Manager, to commercialize and develop further the Finite Element Analysis System SAMCEF resulting from the contributions of numerous researchers.

Twenty-five years later, SAMTECH is now a worldwide company headquartered in Liège, with subsidiaries in Belgium (GDTECH and Open Engineering), France, Germany, UK, Spain, Italy, China, Japan and US and hundreds of customers all over the world. On the one hand, the company has developed its aerospace and defense foundation (with AIRBUS, EADS, SNECMA SAFRAN Group, EUROCOPTER, ALENIA Aeronautica, THALES ALENIA Space, ONERA, SABCA, SONACA, TECHSPACEAERO, ESA, CNES, ...). On the other hand important diversifications were also done with a growing position in the automotive sector (with TOYOTA Motor Corporation, PSA, RENAULT, DAIMLER ...), in wind energy sector (for example in wind energy with ALSTOM, REpower, AREVA, ...) or in mechanical engineering, etc.

### A PRESTIGIOUS CUSTOMER: AIRBUS

Within this list of customers, AIRBUS is certainly the most significant success story. The first SAMCEF licence was installed in Toulouse in summer 1986. During the late eighties, AIRBUS and SAMTECH worked together on parameterized FEA models for fatigue analysis of structures. SAMTECH Toulouse was opened in 1989. During the nineties, SAMTECH and AIRBUS work together on composite FEA simulations. In 1998, the first partnership contract was signed for the development and the commercialization of Professional Solutions. It started with the distribution of the SAFE tool for fatigue analysis of aircraft structure. In 2000, another professional application followed for composite structures analysis. In 2004, AIRBUS decided to launch a huge transnational programme for the harmonization of its 400 legacy engineering software tools, to enhance its engineering methods for composite design and to share its tools with the Risk Sharing Partners of the new A350 XWB aircraft. SAMTECH was selected with MSC software, ANSYS and LMS in the short list. In 2005, SAMTECH accessed to a new level of partnership with the new ISAMI project on the basis of the engineering framework CAESAM developed by SAMTECH. In parallel, SAMTECH could also put in evidence its BOSS Quattro optimization capabilities in the context of the COMBOX project for the preliminary design of composite boxes. In July 2007, a Master Agreement Contract (MAC) was signed for service activity and from July 2008 until now, the deployment of ISAMI is progressing inside the AIRBUS worldwide Extended Enterprise, in order to give access to the same engineering environment to all the structure analysis engineers working for or with AIRBUS.

### 15-16 NOVEMBER 2011 IN LIEGE: 50th ANNIVERSARY OF THE CREATION OF LTAS

Professors Fraeijs de Veubeke and Sander would certainly be proud of this result obtained half a century after the creation of LTAS, today with a team of more than 300 collaborators all over the world. The 11<sup>th</sup> SAMTECH Users Conference that will be held in Liège the 15<sup>th</sup> and 16<sup>th</sup> of November 2011 will be the opportunity to celebrate this important anniversary. This will be done in partnership with the ACOMEN scientific conference of University of Liège. More information about these two parallel events can be found on [http://www.samtech.com/samtech\\_uc\\_2011](http://www.samtech.com/samtech_uc_2011).

Fraeijs de Veubeke



Guy Sander



# COOPERATION OR NOT IN THE EUROPEAN AERONAUTICAL DEFENCE SECTOR

By Paul Betts



Mr Paul Betts is Financial Times Senior Correspondent based in Paris. He has been with the FT for the past 34 years most of which passed as foreign correspondent in Roma, Paris, Milan and New York. He was also aerospace correspondent and for a couple of years travel editor and Deputy Weekend FT editor.

**The present article is the text of the lecture Mr Paul Betts, Senior Correspondent for the Financial Times, gave in Paris on 18 January 2011 within the framework of the Royal Aeronautical Society (RaeS) branch of Paris.**

“ I am speaking to you today not as an academic or a military specialist but as a journalist and observer that has covered on and off during the past 40 years the aerospace and defence sectors. At one stage in my long career as a correspondent for the Financial Times, I was aerospace and defence correspondent in the late 1980s and early 1990s. But my interest in the sector began well before when first in New York and then in Paris in the early 1980s I covered the growing emergence of Airbus as an international force to challenge the then dominant US aerospace industry. And while in New York, Airbus clinched its very first US export contract right under the nose of Boeing and McDonnell Douglas which had yet to merge.

Airbus was an exciting example of Europe attempting and in the end managing to cooperate together to develop what has proved to be a remarkably successful range of commercial aircraft that has once again, according to the latest statistics out this week, overtaken Boeing in terms of aircraft sold, ordered and delivered.

But Airbus, or rather its parent today EADS, has also felt it continues to suffer a disadvantage vis-à-vis its US competitor in that EADS' defence activities remain dwarfed by Airbus that currently still accounts for about two-thirds of EADS annual revenues. Past and present chairmen and chief executives of the European company have regularly sought to expand EADS' defence and security activities with the broad aim of reaching a 50-50 civil-defence balance as is the case with its main US competitor, Boeing.

## WHY HAS EUROPE FAILED TO EMULATE COOPERATION IN THE DEFENCE SECTOR?

So the main question I propose to raise today and hope it will stimulate some debate among yourselves is why has Europe managed to get its common act together in the civil

aircraft market but badly failed to emulate such cooperation in the defence sector which, after all, has traditionally been an engine to finance and stimulate leading edge technologies and developments that ultimately boost through their application the civil aerospace operations? Remember, the Boeing 747 jumbo was originally a military transport programme.

Indeed, one could argue that it would have perhaps been better to concentrate in transforming EADS into a defence group combining Europe's top defence companies while maintaining Airbus as a separate subsidiary or entity focused on its civil operations.

It is not that governments and policy makers have not tried. But national and international corporate interests have continued to act as huge obstacles to meaningful and lasting industrial cooperation on a truly pan-European scale. There are all sorts of reasons why it has been so difficult to consolidate European defence industries, and so much more difficult than the consolidation that has taken place among US rivals. The respective engine makers on both sides of the Channel have fought tooth and nail to power new fighter and combat aircraft rather than work together. Individual countries have different needs and aspirations and tend to regard their defence sector as their sacred preserve. And within these very countries - notably France, I'm afraid - there is fierce competition between the different defence companies even though in many cases they are inevitably linked one way or other. There is the issue of programme leadership, technology sharing and work share. There are the differing and at times conflicting strategic visions of European defence groups and their respective political masters.

In the case of EADS, for example, there has also been a rift between its core shareholders - Lagardere and Daimler - and management. The core shareholders have both indicated that eventually they are sellers of their EADS stakes in order to focus on their core businesses of media in the case of Lagardere and cars in the case of Daimler. And they have both been reluctant to say the least to see EADS as its management has sought to spend cash on acquisitions, especially to expand its defence operations. A senior EADS executive recently admitted in private that EADS has lost out at least once on an interesting US defence acquisition opportunity and who knows how many more other opportunities.

## ABOUT GERMANY

Now let us take some individual European countries starting with Germany. Since the last war, the German government has sought to rebuild and revive its aerospace and defence sector and reposition the country into a leadership position. This is perfectly understandable. The creation of DASA - Deutsche Aerospace - under the ownership and



direction of Daimler was the first step. DASA under its former chairman Jurgen Schrempp wasted little time in flexing its muscles to expand the group's sphere of influence. It took the Paris Air Show and Farnborough by storm. In the old Airbus consortium it pushed hard to increase its presence and German work share in what at the time was considered essentially a French-led "groupement d'interet economique". I remember attending a Singapore Air Show in the early 1990s when the then French chairman of Airbus - Jean Pierson - disclosed to me he was furious with the Germans because DASA was planning to take over Fokker - the now defunct Dutch aircraft maker that challenged directly Airbus at the time in the single-aisle aircraft sector which Airbus was about to penetrate with its A320 fly-by-wire aircraft that has since become the group's best selling aircraft and cash cow. This week, an Indian low cost airline ordered 180 such aircraft in what constitutes a new industry record. Going back to Singapore, I phoned that night DASA from my hotel room and they denied any such thing. Two weeks later they announced they had acquired control of Fokker! It proved a terrible investment but it also gave the German camp the necessary leverage to secure the new Airbus A320 assembly line in Hamburg rather than Toulouse. And since then, the Germans have steadily increased their influence in EADS, largely because they have taken advantage of the constant infighting inside the French camp - what I would describe as a particular "mal francais".

### ABOUT THE UK

Not that my own country, the UK, is a model of virtue in this respect. For all the latest declarations by the new British coalition government seeking to enhance European defence cooperation, there still remains a good deal of reticence and this reticence also seems to be shared by a large chunk of the British population who is opposed to military sharing and cooperation. My newspaper recently carried out a Harris survey that showed that people in Britain are far less keen than those of other leading European nations on the idea of sharing military resources with other countries. The findings suggest that many Britons see it as important that the UK retains a strong national grip on its defence assets. Indeed more than one-third of Britons surveyed oppose sharing military assets while only 13 per cent of the French oppose the sharing of military resources. About 60 per cent of the French respondents said they supported the idea of sharing and cooperating - almost double the number of Britons with a similar view. All other European countries polled expressed support for sharing. Almost half of Germans and Italians and 44 per cent of Spaniards said they backed the concept. That is well above the 33 per cent of Britons. And these findings serve to highlight the difficulties of European countries cooperating in the defence sector as well as the difficulties Nato faces in pushing for greater cooperation between military powers in Europe to avoid duplication of resources.

The other old chestnut that everybody constantly raises is in which camp does the UK really sit - Europe or the US? In the case Britain's defence champion of BAE Systems the answer seems pretty obvious, notwithstanding the recent Franco-British agreement to reinforce bilateral cooperation in defence in a significant way.

BAE Systems, or British Aerospace as it was once known, was always the reluctant partner in Airbus. I remember when I was covering the sector for the FT, the then chairman of the company, the late Professor Roland Smith, used to boast that he had never set foot in Toulouse and never intended to do so. The company has since sold its stake in Airbus as part of its strategy of focusing on defence and has made the US the second pillar of this strategy. It is a significant partner in the new US Joint Strike Fighter. It has made various US acquisitions, one just very recently, and yet it also remains a key partner in the European Typhoon of Eurofighter in partnership with EADS and the Italians of Finmeccanica. That particular partnership has not been a bed of roses with the three partners all manoeuvring to defend and promote their respective interests.

### ABOUT FRANCE

As for France one can only sadly note as an observer that the country's various defence companies continue to behave as rivals rather than potential partners. Take Dassault. EADS holds a 40 per cent or so stake in this company but Dassault remains fiercely independent. Its Rafale is a direct rival to the Typhoon. It has become the industrial core shareholder of Thales, a company EADS would have liked to absorb a few years ago, and so for that matter the Safran aero-engine and defence systems group.

### ABOUT THE LATEST FRANCO-BRITISH COOPERATION PACT

One of the most concrete proposals in the latest Franco-British cooperation pact is cooperation in developing drones that are considered increasingly important for surveillance and combat missions in the current military theatres, not least Afghanistan. Dassault and BAE Systems are cooperating already but Dassault made it abundantly clear quite recently that it did not want to enlarge this cooperation to EADS which is also seeking to develop drones. It would clearly make sense for the Europeans to develop jointly one drone for both their requirements and also for export markets given that it has become essential to export defence equipment to continue funding expensive programmes at a time of stringent government defence budgets and cuts. The Pentagon has just announced it will be cutting the US defence budget, by far the world's single largest, by \$78 billion over the next five years. The French and the British, who after the US have traditionally been the big defence spenders, are also cutting back sharply. The British are scrapping the legendary Harrier attack aircraft. The French are cutting 54,000 jobs in the armed forces by 2015.

## THE COMPETITION FOR EXPORTS IS BOUND TO KEEP INTENSIFYING

So the competition for exports is bound to keep intensifying. In the US, the Obama administration has already told its defence conglomerates to focus on exports to offset the cuts in the defence budget. It is also encouraging US manufacturers to pursue more consolidation and in the case of competitions for big export contracts to field only one US offer.

And what is Europe doing? The opposite, it seems, by continuing to field several competing strike plane offers in the key competitions currently taking place around the world. Take Brazil, for example. Dassault and the French government finally believed last year the Rafale had finally won its first ever export contract after waiting for this happy moment for ten years. Former Brazilian President Lula seemed to have favoured the French offer to show his independence to the US. But the Swedish Gripen also challenged the Rafale for the Brazilian contract while the US put its full lobbying and political weight behind the Boeing F18 Super Hornet. The new president of Brazil has since decided to reopen the competition from scratch. This is undoubtedly bad news for Dassault, especially since she is asking the Americans to outline what transfers of technology they would be prepared to give the Brazilians to secure the contract.

In the current situation, it seems an aberration for Europe to offer three different combat aircraft in the market - let alone one single product to compete not only against the Americans but also against the Russians and soon probably the Chinese who recently displayed their ability to build a strike fighter during the recent visit to China of the US defence secretary. And it is not just strike fighters that are the European problem. European companies compete with different helicopter offerings, drones and other equipment. Even between themselves they don't seem able to agree. Take for example the long standing saga of Franco-Italian collaboration in naval frigates and their ongoing row over equipping them with heavy torpedoes.

## THE FUTURE OF EUROPEAN DEFENCE COMPANIES MUST LIE IN MORE COOPERATION AND PARTNERSHIP

The future of European defence companies must lie in more cooperation and partnership to fund the heavy expense of modernising sophisticated defence procurement such as fighter aircraft. Going it alone, as Dassault has done with the Rafale, is simply not viable anymore given the company can no longer rely on French procurement alone but needs to sell its flagship combat aircraft in export markets.

Europe, it seems to me, has several choices. It can keep competing between itself in the name of national interests but if it does so it will ultimately shoot itself in the foot as its international competitors will continue winning the lion's share of export business. It can develop more bilateral cooperation as the French and British are now seeking to do, but this will still fall short of the overall needs. The answer is clearly pan-European cooperation on a scale that can compete against the Americans and the new rich emerging regions with their own defence industry ambitions. In short, Europe simply cannot afford three separate strike planes. It has shown it can cooperate, granted after considerable pain and difficulty, in the civil aircraft business with Airbus. And even before Airbus, the Concorde showed how advanced Europe can be and successful when two countries fully cooperate as Britain and France did on this programme from airframe to engines.

It is now high time to create a European defence grouping of similar scale and ambition as Airbus. Otherwise, to quote a European defence expert cited anonymously last week in the New York Times, the European defence sector risks becoming "moribund". He suggested it already was. I think there is still time to prove this expert wrong, but no very much time."

*Paul.Betts@FT.com*

## ABOUT AIRBUS MILITARY

### AIRBUS MILITARY A400M BEGINS REFUELLING TRIALS WITH RAF VC10



figure 1

Airbus Military has performed an initial series of air-to-air refuelling trials of the A400M airlifter using a Vickers VC10 tanker of the UK Royal Air Force (RAF) operating from Toulouse. The first A400M development aircraft, "Grizzly One", executed a series of dry contacts with the VC10's fuselage-mounted hose drum (HDU) on the first day of the trials on 15 February (*figure 1*).

### AIRBUS MILITARY A400M BEGINS COLD WEATHER TRIALS IN SWEDEN

Airbus Military's second development aircraft, "Grizzly Two", visited Kiruna in northern Sweden for executing four days of cold weather trials at the beginning of February. The team experienced temperatures down to -21°C and



figure 2

successfully achieved all the planned test points during a programme on the power plants (figure 2). The A400M was accompanied by an Airbus A340-300 carrying support equipment and the personnel team. These tests will be followed by further tests in more extreme temperatures at Kiruna this winter and next.

**THE A330 MRTT**

**THE NEED FOR A NEW GENERATION OF TANKERS**

Recent conflicts have demonstrated the ever-increasing need for a new generation of modern tankers that are more capable and more versatile: the A330 MRTT is the response to this need.

**THE A330 MRTT**

The Airbus Military A330 MRTT has proven many flight advantages: superior performance, latest technology available, true multi role flexibility, large fuel capacity, permanent lower deck freight capacity, excellent payload/range capability, low life cycle costs.

**AIRBUS MILITARY DEMONSTRATES FINAL A330 MRTT REFUELLING SYSTEM**

On 26 January 2011, the A330 MRTT has successfully passed fuel to receiver aircraft using the Fuselage Refuelling Unit (FRU) for the first time, meaning that all of the aircraft's refuelling systems have now be demonstrated (figure 3).

In a 3 hour 10 minutes sortie from Getafe near Madrid on 21 January, the Future Strategic

Transport Aircraft "FSTA", variant of the UK Royal Air Force conducted a series of "wet contacts" with two F-18 fighters at an altitude of 15,000 ft and at speeds of 250 to 325 kt.

The FRU is a hose and drogue similar to those fitted under the wings, but with a higher rate of fuel transfer, and which is also developed and supplied by Cobham (UK).

The full complement of refuelling systems which can equip the A330 MRTT, and which have now all been demonstrated, consists of: the FRU, the under-wing hose-and-drogue, the Airbus Military Aerial refuelling Boom System (ARBS), plus the Universal Aerial Refuelling Receptacle Slipway Installation (UARRSI) used to receive fuel from another tanker. The ARBS is the only new generation boom which allows the fastest fuel transfer – 4600 litres/min/1200 US gal – hereby greatly reducing the refuelling operation time.

Having received its supplemental type certificate from the EASA in March 2010 and military certification from Spanish Authority INTA in October 2010, the A330 MRTT is the only new generation strategic tanker/transport aircraft flying and available today.



figure 3



## NEWS FROM CLEAN SKY

## THE NEW GOVERNING BOARD

- Mr Charles Champion replaces Mr Marc Ventre as Chairman.
- Mr Rolf Henke, member of the Executive Board of DLR, responsible for Aeronautics, is the new Vice-Chairman for 2011, in replacement of Mr Acedo.
- Mr Robert-Jan Smits, new Director General of DG RTD, is a new Member of the Governing Board.

8<sup>th</sup> CALL FOR PROPOSALS

The Clean Sky Joint Technology Initiative has launched its 8<sup>th</sup> call for proposals. This call covers 58 topics with total available funding of 32 million Euros. This is the highest value call launched to date by Clean Sky. Deadline for submitting proposals: 3 May 2011.



## ABOUT SINGLE EUROPEAN SKY ATM RESEARCH JOINT UNDERTAKING (SESAR JU)

## CALL FOR NEW ASSOCIATE PARTNERS

On 21 February 2011, SESAR Joint Undertaking has published a public call for proposals relating to the selection of 'Associate Partners'. Partners are sought in 6 domains: (i) Information Management; (ii) Network & Airport Collaboration; (iii) Technical service management; (iv) Airborne and CNS Systems; (v) Modelling Support to Validation; (vi) UAV/UAS Integration in SESAR.

The aim of SJU is to conclude up to ten direct framework contracts with either SMEs (Small and Medium Size Enterprises), or research organisations, universities and institutes of higher education.

This new call for proposals is launched in order to complement the expertise in the SESAR programme.

## FIRST EXERCISES KICK OFF

In February, the first two validation exercises in the framework of the SESAR Release 2011 took place. The first SESAR release will present to the aviation community initial results of the SESAR programme by the end of 2011. The aim of the plan is regroup projects and validation exercises to deliver together with the SESAR members as early

as possible tangible results at a pre-industrialisation stage.

The two first exercises concern:



- *Evolution of Airborne Safety Nets* = generalisation of Auto Pilot / Flight Director TCAS (Traffic Collision Avoidance System), a project led by the DSN (Direction des Services de la Navigation Aérienne, France). This guidance mode aims at supporting pilots flying TCAS Resolution Advisories through an automated solution. TCAS, mandatory worldwide onboard all civil transport aircraft since 2003 to reduce the risk of mid-air collision, triggers Resolution Advisories telling the pilot the manoeuvre he has to fly on order to avoid a potential threat.
- *Link between smaller airports and the CFMU (Central Flow Management Unit)*, a project led by NATS (UK). A new prototype system has been installed at Southampton Airport providing an improved means of communication enabling the CFMU to be kept up-to-date with the status of departing aircraft.

## EGNOS NAVIGATION SYSTEM BEGINS SERVING EUROPE'S AIRCRAFT

On 2 March 2011, the EGNOS (European Geostationary Navigation Overlay System) Safety-of-Life signal was formally declared ready available to aviation. For the first time, space-based navigation signals have become officially usable for the critical task of vertically guiding aircraft during landing approaches.

By using 3 satellites and a 40-strong network of ground stations, EGNOS sharpens the accuracy of GPS SATNAV signals across Europe. The signals are guaranteed to the extremely high reliability set out by the ICAO standards, adapted for Europe by EUROCONTROL. In order to use EGNOS for approaches, Air Navigation System providers



EGNOS-guided aircraft on approach



EGNOS sharpens GPS accuracy over Europe

must publish runway procedures; aircraft and operators have to be equipped with certified receivers and be approved for operations.

Francisco Salabert, of Eurocontrol, declared: “EGNOS offers the aviation industry the means to provide accurate and safe vertically guided approaches to smaller airports where a conventional precision landing system is not today economically viable. Its introduction will reduce delays, diversions and cancellations of flights into and out of these airfields while improving passenger safety. Eurocontrol is coordinating EGNOS’s operational introduction across Europe. Runway procedures have already been designed for various airports and heliports, with more on the way.”

## GALILEO TESTED IN EUROPE-WIDE DRESS REHEARSAL

**GALILEO is still 5 to 6 months away from its first launch, but one satellite has already been put through its paces, taking centre stage in a Europe-wide dress rehearsal.**

This satellite never left the confines of its Thales Alenia Space integration facility in Rome, but was connected to a distant trio of control centres during the nine-day first System Compatibility Test Campaign (SCTC-1) which began on 25 January 2011. SCTC-1 is the first time all these geographically-dispersed control centres came together to work with an actual Galileo flight model. The satellite was controlled from Toulouse for the first two-day of launch and early operations (LEOP) simulation, before switching to Oberpfaffenhofen and Fucino for operational testing, including actual activation of satellite devices. The final two days were devoted to end-to-end testing, disseminating navigation and integrity messages from Fucino to the satellite and to test receivers beside the satellite.

These same sites will oversee the satellite for real once it is launched in August 2011 on a Soyuz launcher from Kourou (Guiana), along with a second Galileo satellite.



EGNOS-equipped aircraft cockpit



SCTC-1 end to-end testing



# ESA'S SECOND ATV JOHANNES KEPLER: SUCCESSFUL RENDEZVOUS AND DOCKING WITH THE ISS

## 16 FEBRUARY 2011: SUCCESSFUL LAUNCH

On Wednesday 16 February at 21:50 GMT, the Ariane 5 lifted off from Guiana Space Centre. The launcher and its 20.06-tonne payload flew over the Atlantic towards the Azores and Europe. An initial 8-minute burn of the upper stage injected it, with Johannes Kepler, into a low orbit inclined at 51.6° to the equator.

After a 42-minute flight, the upper stage reignited for 30 seconds to circularise the orbit at an altitude of 260 km. After 64 minutes into flight, the unmanned supply ship - Automated Transfer Vehicle (ATV) - separated safely from the spent upper stage. It deployed its four solar wings soon after and proceeded with early operations before beginning its climb to the International Space Station (ISS).



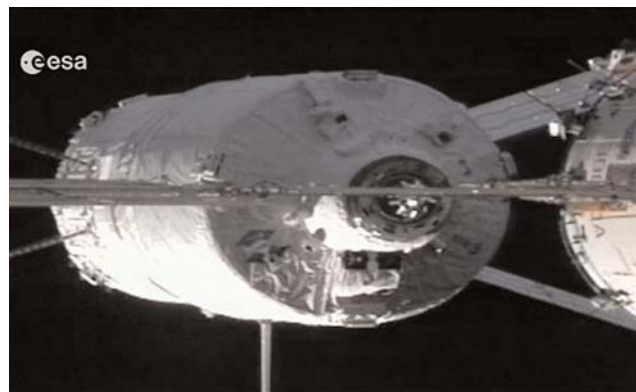
Europe's ATV Johannes Kepler supply ship on its way to ISS.

## 24 FEBRUARY 2011: DOCKING WITH THE ISS

Eight days after launch, on Thursday 24 February, the ATV Johannes Kepler completed a flawless rendezvous and docking with the International Space Station at 15:59 GMT, to deliver essential supplies.

The approach and docking were achieved autonomously by its own computers, closely monitored by ESA and CNES teams at the ATV Control Centre in Toulouse (figure 3), as well as the astronauts on board the ISS (figure 4). ATV's own second set of sensors and computers provided an independent check. The relative speed during final approach remained below 7 cm/s and the accuracy within a few centimetres.

The ATV closed in on the ISS from behind in order to dock with Russia's Zvezda module. At close range, the spaceship computed its position through sensors pointed at laser



ATV-2 just before docking with ISS.

reflectors on the ISS to determine its distance and orientation relative to its target. At 15:59 GMT, ATV's docking probe was captured by the docking cone inside Zvezda's aft end. The closure of hooks completed the docking sequence nine minutes later.



The ATV Control Centre in Toulouse.

The ATV Johannes Kepler will remain to the ISS until June 2011, serving as an additional module, providing a shirtsleeve environment for the astronauts and reboosts to move the complex to a higher altitude.



ISS astronauts prepare for ATV docking.

**From information provided by ESA Media Relation  
Department. [www.esa.int](http://www.esa.int) [media@esa.int](mailto:media@esa.int)**



# MAPPING JAPAN'S CHANGED LANDSCAPE FROM SPACE

## 16 March 2011:

Following the earthquake and tsunami that hit Japan on 11 March, the biggest earthquake Japan has suffered in living memory, satellite imagery has been vital in providing a clear picture of the extent of devastation to aid the relief effort now underway.

## THE INTERNATIONAL CHARTER "SPACE AND MAJOR DISASTERS"

Founded 10 years ago, the International Charter is a unique mechanism to ensure that timely satellite images are made freely available to authorities and aid workers coping with the aftermath of a disaster. By combining Earth observation data from different space agencies, it allows resources and expertise from around the world to be coordinated for rapid response to major disasters. The value of the initiative lies in the way it has been set up to gather and coordinate a range of different satellite data, turn them into usable products and provide a single access 24 hours a day, 7 days a week, and at no cost to the user. Satellite maps are providing essential information for search and rescue teams on the ground and for damage assessment.

## IN RESPONSE TO THE EVENT OF 11 MARCH:

The International Charter was triggered by the Cabinet Office of Japan the same day the earthquake struck.

Work is being coordinated by the Japan Aerospace Exploration Agency, JAXA, and the Asian Institute of Technology. Data are being used from a wide range of satellites such as Germany's TerraSAR-X and RapidEye, France's SPOT-5 and ESA's Envisat along with high-resolution imagery from US satellites.

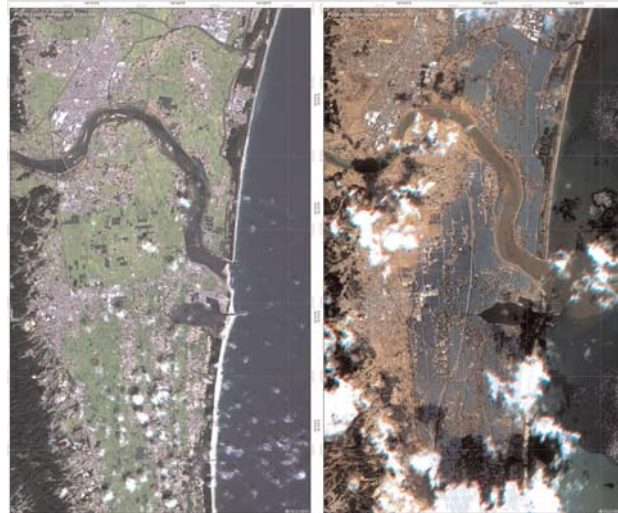
A large collaboration is at work to exploit data offering value-adding analysis with specialist centres from France (Sertit), Germany (DLR-ZKI) and the United Nations, while JAXA provide dedicated mapping service to the Japanese authorities.

**From information provided by ESA  
Media Relation Department.  
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Figure 2: The city of Soma and the surrounding region before and after the tsunami. Comparison of RapidEye data acquired on 5 September 2010, on the left, and post-disaster data acquired on 12 March 2011 on the right.

Credits: RapidEye AG, DLR, Google Earth. Map reproduced by ZKI.

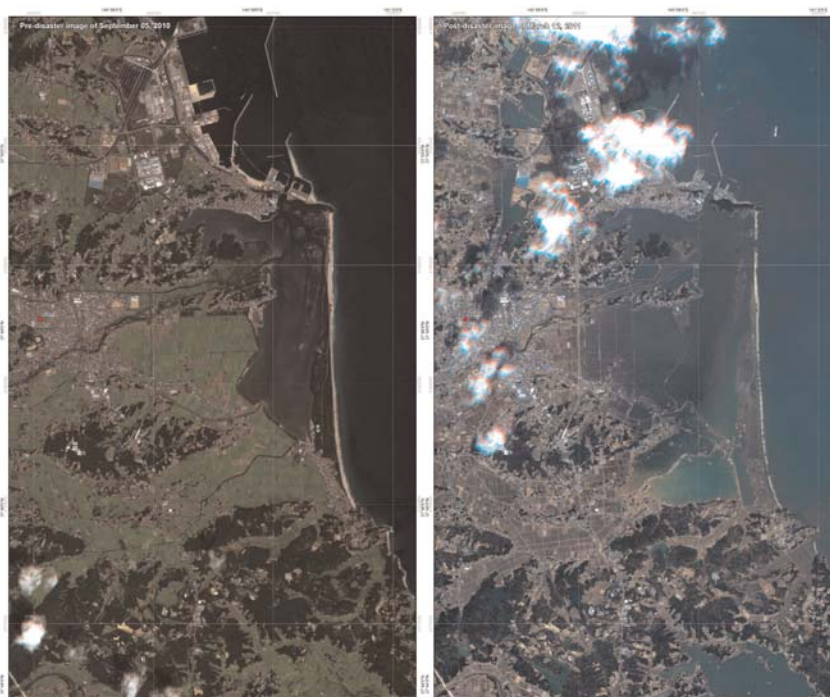
## TWO EXAMPLES OF PICTURES



Credit ESA

Figure 1: Torinoumi before and after the tsunami. These images were acquired by the German optical RapidEye and radar TerraSAR-X satellites. They show Torinoumi on the eastern coast of Japan on 5 September 2010, and after the tsunami on 12 March 2011.

Credits: RapidEye AG, DLR, Google Earth. Map reproduced by ZKI.



Credit ESA

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**Chinese Society of Astronautics (CSA)**

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**International Council of the Aeronautical Sciences (ICAS)**

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Executive Secretary: Anders Gustavsson,  
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**49<sup>th</sup> INTERNATIONAL  
PARIS AIR SHOW  
LE BOURGET**

**FROM 20 TO 26 JUNE 2011**

HOME / THE SHOW / TO EXHIBIT / TRADE VISITORS / PRESS / GENERAL PUBLIC / JOBS AND TRAINING / PRACTICAL INFORMATION

FROM MONDAY 20 JUNE TO SUNDAY 26 JUNE 2011  
FROM 9:30 AM TO 6 PM  
AT PARIS LE BOURGET

TRADE VISITORS DAYS  
FROM 20 JUNE TO 23 JUNE 2011

OPEN TO THE GENERAL PUBLIC  
FROM 24 TO 26 JUNE 2011

>> ACCESS EXHIBITOR AREA <<



### KEY FIGURES

- 2000 international exhibitors
- 138 000 trade visitors
- 193 000 general public visitors
- 130 000 sqm total area sold (halls, village, chalets, outdoor area)
- 192 000 sqm aircraft display areas
- Over 140 aircrafts present including 42 in flying display
- 205 official delegations from 88 countries
- 3000 accredited journalists from all over the world

The Paris Air Show has been the world's leading aviation and space event for over 100 years.

The 49th Paris Air Show will take place at Le Bourget exhibition centre from 20 to 26 June 2011, and will once again bring together all the industry's players worldwide to showcase the latest technological innovations.

The first 4 days of the Show, exclusively for the industry, are followed by 3 days for the general public.

The Paris Air Show is organised by Salon International de l'Aeronautique et de l'Espace (SIAE), a subsidiary of GIFAS (the French Aerospace Industries Association).





YEAR 2011

28-30 March • **3AF in partnership with AIAA** – Applied Aerodynamics – Orléans, France  
[lisa.gabaldi@aaaf.asso.fr](mailto:lisa.gabaldi@aaaf.asso.fr)

30 – 31 March and 1<sup>st</sup> April • **European Commission (EC) DG Research** – Aeronautics Days 2011 ‘Innovation for Sustainable Aviation in a Global Environment’ – Political top-down messages- Technological achievements-Review process of meeting the 2020 Vision goals and the Aeronautics research Agenda - Palacio Municipal de Congresos, Madrid, Spain  
[www.aerodays2011.org](http://www.aerodays2011.org)



12 April • **ESA** – 11<sup>th</sup> Symposium on Advanced Space Technologies in Robotics and Automation (ASTRA) – ESTEC, Noordwijk, NL

13-14 April • **RAeS** – Aerospace 2011: Funding the Future – Aerospace and Aviation in the Age of Austerity London, UK – [www.aerosociety.com/conference](http://www.aerosociety.com/conference)

13-15 April • **CEAS** – Euro GNC 2011 – 1<sup>st</sup> Specialist Conference on Guidance, Navigation & Control – Hosted by DGLR. Venue: Technische Universität München City Campus - Munich, Germany  
[gnc@dglr.de](mailto:gnc@dglr.de) / +49 228 30 80 5-0 – [Florian@Holzapfel@tum.de](mailto:Florian@Holzapfel@tum.de) / +49 89 289 16081

3-6 May • **3AF** – Missile Defence – San Sebastian, Spain – [lisa.gabaldi@aaaf.asso.fr](mailto:lisa.gabaldi@aaaf.asso.fr)

9 May • **IAA** – 2011 Planetary Defence Conference – Bucharest International Conference Centre, Romania

22-26 May • **ESA/CNES/EASP** – 20<sup>th</sup> ESA Symposium on European Rocket & Balloon Programmes and Related Research – Hyères (France) - [www.esa.int](http://www.esa.int)

5 June • **ESA** – GNC 2011 – 8<sup>th</sup> International ESA Conference on Guidance, Navigation & Control Systems – Carlsbad, Czech Republic – [www.esa.int](http://www.esa.int)

5-8 June • **AIAA/CEAS** – 17<sup>th</sup> AIAA/CEAS Aeroacoustics Conference - Doubletree Hotel - Portland, Oregon (USA)  
[www.aiaa.org](http://www.aiaa.org)

7 June • **ESA** – European Space Surveillance Conference – Madrid – [www.conferences.esa.int/](http://www.conferences.esa.int/)

8 June • **ESA** – International Workshop of Planning and Scheduling for Space – IW PSS 2011 – ESA/ESOC – Darmstadt, Germany – [www.conferences.esa.int/](http://www.conferences.esa.int/)

8-9 June • **RAeS** – The World Outside The Aircraft – Simulating The operational Environment – Spring Flight simulation Conference- London – [www.aerosociety.com/conference](http://www.aerosociety.com/conference)

14-16 June • **SEE/GIFAS** – European Test and Telemetric Conference (ETTC) – Toulouse, France – [communication@see.asso.fr](mailto:communication@see.asso.fr)

14-16 June • **EASA** – Europe/US international aviation safety conference 2011 – [www.easa.europa.eu/events/events.php](http://www.easa.europa.eu/events/events.php)

## YEAR 2011

20-26 June • **International Air Show – PARIS LE BOURGET** – Professionals: 20-23 June

26-30 June • **3AF** – International Forum on Aeroelasticity and structural Dynamics (IFASD) – Paris.  
lisa.gabaldi@aaaf.asso.fr

4 July • **EUCASS** – 4<sup>th</sup> European Conference for Aerospace Sciences – Saint-Petersburg, Russia –  
www.conferences.esa.int/

11 July • **ESA** – 4<sup>th</sup> International Symposium on Physical Sciences in Space – IPSP 4 – Bonn Bad-Godesberg, Germany

31 August • **ESA** – 3<sup>rd</sup> International Colloquium – Scientific and Fundamental Aspects: the GALILEO Programme – Copenhagen, Denmark - [www.conferences.esa.int/](http://www.conferences.esa.int/)

13-15 September • **Organiser NVvL - Rotorcraft Community** –37<sup>th</sup> European Rotorcraft Forum – ERF 2011 – Vergiate/Gallarate – Ticinio Park - Italy – [hermans@nlr.nl](mailto:hermans@nlr.nl)

28-29 September • **RAeS** – An International Approach to Flight Crew Training Standards – annual RAeS International Flight Crew Training Conference – [www.aerosociety.com/conference](http://www.aerosociety.com/conference)

3-7 October • **IAC 2011** – 62<sup>nd</sup> International Astronautical Congress – Central theme: African Astronautics – Venue: Cape Town International Convention Center (CTICC), Cape Town, South Africa.

18-21 October • **SAE** – SAE 2011 Aerotech Congress & Exhibition - Centre de Congrès Pierre Baudis, Toulouse, France – [www.sae.org/events/atc/](http://www.sae.org/events/atc/)

24-28 October • **CEAS** – 3<sup>rd</sup> CEAS European Air & Space Conference – Giorgio Cini Foundation – Venice, Italy.  
[www.ceas2011.org](http://www.ceas2011.org)

- Monday 24 October: Opening Plenary, Keynote speech Parallel Sessions, Exhibition, Welcome Reception
- Tuesday 25 October: Keynote Speech, Parallel Sessions, Exhibition, Civic reception
- Wednesday 26 October: Parallel sessions, Exhibition, Gala Dinner
- Thursday 26 October: Parallel sessions, Exhibition, Closing Plenary
- Friday 27 October: Technical Tours

Key Dates: Abstract acceptance 24 April – Full paper submission 31 July.

17 November • **IAA** – Conference: Climate Change and green systems, Disaster Management & Natural hazards, Planetary & Lunar exploration, Human Spaceflight. Ronald Reagan Building and International Trade Center, Washington DC – [sgeneral@iaaweb.org](mailto:sgeneral@iaaweb.org)

29 Nov. - 2 dec. • **ESA** – Earth Observation for Ocean-Atmosphere Interactions Science – Frascati (Italy)  
[www.esa.int](http://www.esa.int)

## YEAR 2012

12-17 June • **ILA Berlin** – International Airshow – [www.ila-berlin.de](http://www.ila-berlin.de)

09-15 July • **International Farnborough Air Show**

23-28 September • **ICAS** – ICAS2012 Congress – Brisbane, Australia – [secr.exec@icas.org](mailto:secr.exec@icas.org)

1-5 October • **IAC** – 63<sup>rd</sup> International Astronautical Congress- IAC2012  
Nostra D'oltremare Convention Center- Naples, Italy

**CEAS 2011 WILL BE A JOINT EVENT MERGING THE THIRD CEAS EUROPEAN AEROSPACE CONFERENCE AND THE TWENTY-FIRST AIDAA CONGRESS  
A SOMPTUOUS VENUE: THE GIORGI CINI FOUNDATION, VENICE**

## Venue: Giorgio Cini Foundation

- The Giorgio Cini Foundation is located on the Island of San Giorgio Maggiore, three minutes journey from Piazza San Marco.
- This monumental complex used to be a Benedictine monastery, featuring Palladio's Cloister and Refectory, Longhena's Library and other works from great architects of the past.
- The elegant entrance foyer may be used for exhibition stands.



## Venue: Fondazione Cini

- The Foundation's Centre is composed by eight conference rooms of different sizes.
- The "Salone degli Arazzi" can hold up to 500 people.
- Seven more rooms, all remarkable in terms of architectural history, have different capacity and can hold from 30 to 300 people.
- Further spaces are available for exhibition area, registration desks, secretary, lunches and coffee breaks.

