The Quarterly Bulletin of the
COUNCIL OF EUROPEAN AEROSPACE SOCIETIES
3AF– AIAE– AIDAA– DGLR– FSAE– FTF– HAES– NVvL– RAeS– SVFW–TsAGI
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Editorial

INVESTING IN YOUTH

The future of Europe is in the hands of its youth: this is a basic truth. However, surprisingly, while we are full in course of the election campaign for the renewal of the European Parliament, we hear almost nothing about education and culture, and we see no proposals from the candidates on how to prepare the students and young professionals to live in an increasingly integrated Europe. The question is a very broad and difficult one, due to the large number of Member States and the diversity of languages and cultures; but this is all the more reason to concentrate great efforts on it.

In the aerospace sector, the projects, more and more complex, are developed across several national borders and include the highest technologies. So, to overcome the numerous challenges which confront us in a fierce world-wide aerospace market, talented engineers are needed. Unfortunately, in the past two or three decades within Europe, there have been clear indications that the most brilliant students prefer careers in business and finance to those in science, technology and engineering.

Action is clearly necessary to reverse this trend by taking the measures that will allow us to attract and then retain the best talent in the air and space activities. The organising Committee of the upcoming CEAS2009 Air & Space Conference in Manchester has taken an important step in this direction by including in the Conference agenda the launch of **a new European Young Aerospace Professional (EYAP) forum**. The Royal Aeronautical Society (RAeS) holds an annual conference for its young members and conscious of its success, the idea was born to expand and enhance this successful model to the domain of the CEAS: this will be done by running a specific "Young Professionals" session on Thursday 29 October. As a matter of fact, the CEAS2009 Conference represents an excellent occasion to launch and promote a new forum dedicated to early career aerospace professionals, graduates and students in Europe, offering them the possibility to have a firsthand contact with the available array of firms and institutions. This "YP" address issues of the highest importance for the future of European aerospace. For this reason we devote pages 5 and 6 of this issue to a detailed account of this initiative.

Of course it will be only a 'launch', and even it as successful and promising as expected, the CEAS management board must take immediate steps to consolidate the progress achieved and maintain its momentum by setting up a team specially dedicated to the development and the life of the EYAP forum. A real 'Project Plan' should be established, not only within the framework of the CEAS, but also in close co-operation with the European institutions, notably the European Commission.

A hard task in prospect, but how exciting!

Jean-Pierre Sanfourche

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

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A MESSAGE FROM ALLAN COOK, PRESIDENT OF THE AEROSPACE AND DEFENCE INDUSTRIES ASSOCIATION OF EUROPE

Allan Cook
is President of the ASD and CEO of Cobham

Globally, we are witnessing unprecedented economic developments, the full consequences of which are not yet clear and may not be for some time. Our commercial customers have less to spend on our products and our governments are under increasing pressure to spend more on social programmes and provisions and even less on defence. The severe tightening of credit conditions has made it increasingly difficult for airlines to finance the purchase of new aircraft, with air passenger traffic figures and freight volumes down by 10% and 22% respectively, compared to the same month last year. The effects of the swine fever pandemic will only exacerbate the situation.

However, with a century of powered flight behind us, we should remain vigilant, but confident, about the future. The civil aeronautics business is a cyclical one, and our sector has already gone through crises, in particular in the early 90s and post-September 2001. For example, the cancellation rate at Airbus today stands at 3%, compared with 6% in 2001 and the monthly manufacturing ship rate for single aisle aircraft is still at least 50% higher than that of 2002. These figures should help us keep things in perspective, because in the long term, air transport remains a fast growing sector, which has been doubling in size every fifteen years.

The dual nature of a large part of our industry is also an asset in such times, as the defence sector is inherently more stable, less cyclical than the civil one. However, to remain agile and responsive in a dynamic, unpredictable global market requires further investment in R&D, particularly if we are to make meaningful progress tackling many of the environmental challenges we face. Market driven R&D is the life-blood of our industry, and it is vital for us to be able to prepare the next generation of European aircraft and support our defence industry. Agility and ingenuity alone cannot keep our industry fit for purpose.

The lost opportunity cost of having an R&D budget without the right resources to develop products and services is significant. One of the distinguishing characteristics of our industry is that we are dependent, more than any other industry, on access to outstanding scientific and technical skills to be able to meet the exacting demands of the aeronautical and defence sectors. We also need talented people to manage complex projects across many national borders, with extended supply

Allan Cook

Appointed to the board in 2001, Allan Cook, aged 58, has an honours degree in electronic/control systems engineering, and has more than 30 years international experience working in the automotive, aerospace and defence industries on high technology products and systems. Allan was awarded a CBE in the Queen's New Year's Honours list in 2008.

His career started with Ferranti where he worked in their inertial systems laboratory for three years, before moving to Bourns/Pmi where he developed fuel injection systems for Bosch in the automotive industry. He was made managing director of Bourns/Pmi at the age of 35 responsible for their European sales and manufacture.

In 1988 he joined Hughes Electronics as CEO for their Scottish operations, responsible for aerospace and defence programmes including AMRAAM, APG65 Radar and space operations.
He subsequently took on full responsibility for Hughes (Europe) and was based in Brussels covering operations in the UK, Germany, Spain and Russia. Allan joined GEC-Marconi in 1995 to head up their Airborne Radar Division responsible for the development of the ECR 90 radar for the Eurofighter. He was promoted to Group Managing Director of the Avionics business prior to the merger with BAe and was responsible for all the Group's Eurofighter systems including Airborne Radar, DASS, Helmet and Flight Control Systems. Other programme responsibilities included JSF development, Phoenix, TIALD and JORN. Following the merger with BAe he became Eurofighter Group Managing Director for BAE Systems, before joining Cobham in 2001.

Allan is President of ASD, Chairman of the National Skills Academy for Manufacturing, a member of the Apprenticeship Ambassadors Network (AAN), a director of the Industrial Forum and the DTI Aerospace Forum, a committee member of the UK Ministerial Advisory Group for Manufacturing and a member of the SBAC Council.
He is married to Kath with two daughters; Sarah and Victoria, and a grandson called Arran.
His hobbies include squash, walking, wine and music.

chains. We must therefore be capable of attracting, retaining and motivating the best talent so that we can do the job that our customers and our nations are relying on us to do.
We do have a "window of opportunity" which has presented itself as an outcome of the turmoil in the Financial Services. For the past two decades the financial services market has been able to attract the best talent across Europe with promises of glittering careers and financial rewards. This has changed now and we should be promoting our industry as never before.
Decisive progress needs to be made towards the creation of a genuine internal equipment market in Europe. In that respect the European Commission's 'Defence package' is definitely a step in the right direction, and ASD member companies look forward to the emergence of a new environment, more conducive to the development of their activities. This is particularly crucial now, when the affordability of equipment programmes can no longer be guaranteed at national level.

Finally, the current economic situation calls for a quantum leap forward in the nature and extent of cooperation between European and US industries. Interests across the Atlantic are certainly not always identical, but many of the forces that affect us are global, particularly at the moment. We will only find answers to the challenges they raise by learning to work even closer together. Even the talent and resources of the entire worldwide industry will struggle to meet the immense technological and financial demands that lie ahead. We all have an important role to play to stimulate and further strengthen transatlantic cooperation.

Allan Cook
President of the ASD
CEO of Cobham

SOME WORDS ABOUT THE EUROPEAN COMMISSION DEFENCE PACKAGE

The fragmentation of the European defence market and divergent national policies create red tape, hamper innovation and competitiveness and, ultimately, weaken the European Security and Defence Policy (ESDP). On 5 December 2007, the European Commission proposed new competitive measures for defence industries and markets, within the framework of the co called "EC Defence Package". The latter is a package of initiatives aiming at improving this situation. It contains three elements: (i) a communication with recommendations for fostering the competitiveness of the sector; (ii) a directive on defence procurement to enhance openness and intra-European competition in Member States' defence markets; (iii) a directive on intra-EU transfers of defence products designed to alleviate the obstacles of intra-community trade.

TO STRENGTHEN THE DEFENCE SECTORS COMPETITIVENESS

The European Commission recommends several actions, among which:

- promote the use of common standards;
- use the legal instruments at its disposal to ensure fair competition for defence industry goods;
- explore the merits of establishing an EU system on security of information;
- to perform a study on how control of strategic assets might be undertaken in the future, particularly focusing on options for ensuring competitive supply at the European level without sacrificing national security interests;
- foster greater overall co-ordination with, and between, Member States to seek the best level of performance while allowing more cost-effective solutions.

DIRECTIVE ON DEFENCE PROCUREMENT

It will be applicable to arms, munitions and war material, but also to certain sensitive non-military security equipments. The rules are adapted to the specificities of such procurements, which are often complex and sensitive. Member States will have at their disposal Community rules that they can use without risk of their security interests. This will enhance transparency and openness of defence markets between Member States.

DIRECTIVE ON INTRA-EU TRANSFERS OF DEFENCE PRODUCTS

This directive aims at significantly simplifying national licensing procedures and therefore facilitating cross-frontier commercial exchanges within the EU. It will contribute to making defence industries more competitive and will facilitate SMEs participation into prime contractors' supply chains. The new legislation should enable security of supply for public procurement and industrial cooperation.

From EC Press Release – IP/07/1860 – Brussels, 5 December 2007.

THE LIFE OF THE CEAS

About the 9th Meeting of the board of Trustees

The 9th CEAS meeting of the Board of Trustees took place in Madrid on Friday 24 April 2009

In The Evening of 23 April: The Welcome dinner

On Thursday 23 April in the evening the AIAE (Asociacion de Ingenieros Aeronauricos de Espana) offered a splendid dinner to the members of the board at the famous Cafe Oriente, Plaza de Oriente, facing the Royal Palace and close to the Opera House. Several CEAS trustees were accompanied with their spouses, thanks to the very nice invitation of the AIAE: quite an excellent initiative which has to be welcomed. So, the guests were more numerous than usual and the conversations were more wide ranging.

The board Meeting

It started at 9:00.

Attendees: **3AF**, François Gayet (representing Michel Scheller, President), Jean-Marc Garot.
AIAE, Antonio Martin-Carrillo, Leandro B. Fernandez-Sainz, Domingo Escudero, Miriam Lopez ;
AIDAA, Franco Persiani – **DGLR**, Joachim Szodruch, Peter Brandt – **FSAE**, Markku Roschier;
FTF, Ulf Olsson, Kaj Lundahl, Petter Krus – **HAES**, Triantafillos Tsitinidis – **NVvL**, Christophe Hermans ;
RAeS, Keith Mans, Paul Bailey – SVFW, Georges Bridel – TsAGI, Sergei L. Chernyshev;
CEAS, Alain Garcia, Wilhelm Kordulla, Jean-Pierre Sanfourche.
Apologies: David Marshall, Constantinos Stavrinidis.

A Major Event: The Entry of Russia in the CEAS

The introduction of Dr Sergey L. Chernyshev (TsAGI) in the CEAS Board. From left to right: Manuel Acero, President of the Instituto de la ingeniería de España - Antonio Martin-Carrillo - Joachim Szodruch - Sergey L. Chernyshev - Georges Bridel.

President **Joachim Szodruch** was particularly pleased to introduce Dr Sergey L. Chernyshev, Director General of the Central Aerohydrodynamic Institute in Russia (TsAGI).
Last year, the CEAS Board had asked Russia to join us: as a matter of fact, Russia is involved in European industry and research. And why the TsAGI? Because this famous institution, over ninety years old, represents in Russia the aerospace community. Besides it will become soon the official the Russian Aerospace Society, similar to the CEAS ones. TsAGI counts today approximately 4000 members.
After the presentation given by **Dr Chernyshev**, the TsAGI as representing the Russian aerospace community was unanimously elected in Madrid as the new CEAS Member.

So, it is a new step forward, since we are no longer ten but ELEVEN Member Societies, and reinforced by quite a prestigious aerospace country!

CEAS GOALS 2009

President Szoduch highlighted his main goals for 2009:

1. The CEAS Air & Space Conference 2009 in Manchester is the major event in our community and must be as successful as our first one in Berlin.
2. The introduction of two Aeronautics and Space Journals by the end of this year.
3. To reach the agreement in the Board on an increased support for students and young professionals with regard to our conferences, symposia, etc. A vision is still to arrange a student exchange within Europe through a CEAS process/mechanism.

4. To finalise our organisation specifically also concerning the various Technical Committees.
5. To nominate the successor of Alain Garcia at the head of the Aeronautics Branch.
6. To enlarge our perimeter by adding two new Aerospace Societies to our Membership.
7. To prepare our second Policy & Strategy Conference in 2010 in Brussels.

The attendees of the CEAS Board Meeting, Madrid, 24 April 2009.

PROGRESS REPORT ON CEAS2009 CONFERENCE

Mr Keith Mans presented the situation of CEAS 2009 preparation. Things are generally evolving in a satisfactory manner. However, the number of papers received from the non UK industrial companies and institutions is not sufficient yet. **So, it has been decided to accept paper abstracts until the end of June. In particular, European and International contributions are sought.**

The agenda of the Conference, set out on pages 8 and 9, is now close to its final state.

ABOUT THE EYAP FORUM

Paul Bailey explained in detail the Young Professionals event.

MANCHESTER CONFERENCE : CEAS 2009 YOUNG PROFESSIONALS EVENT AND FORUM LAUNCH

The Young Members Board (YMB) of the Royal Aeronautical Society holds a successful annual conference for young members aiming at giving them an insight into the wider aerospace world, by focusing on a particular issue and inviting top level speakers. Each main conference session is accompanied by small sessions on careers and engineering registration.

It is planned to expand and enhance this model to European level on the occasion of the CEAS 2009 Manchester Conference, by running a specific Young professionals session on the Thursday.

EUROPEAN OPPORTUNITY

All sessions will contribute to the theme 'European Opportunity', with the focus on being successful in a multi-national industrial environment and jobs market. There will be two parallel strands *(figure 1)*, the first – European Opportunity – being analogous to the RAeS annual conference and the second – Developing Professional – being focused on developing a successful career in Europe. Outside of these events, a third strand of external workshop sessions will operate, to give specific advice on professional development issues.

The Key note speech will be about the recession, what it means for jobs and specifically what it means for young people thinking about or are in the industry.
There is also a significant opportunity to show what the industry has to offer for non-engineering/technical personnel.

EUROPEAN YOUNG AEROSPACE PROFESSIONAL (EYAP) FORUM

It is planned to launch and promote a new and substantial forum dedicated to early career aerospace professionals, graduates and students in Europe with the following objectives:

Keynote Uncertain Skies: Getting ahead in a challenging economy		
European Opportunity Strand	***Developing Professional Strand***	***External Events***
Gravy train or missed boat? European Research funding	Eur Ing: What and why?	CV Clinic
Galileo: European Space Collaboration	IEng and Ceng: Assessing the benefits	Graduate scheme presentations
Centralised Airworthiness: EASA	Leadership in Pan-European ventures	Presentation skills
Competition from Asia and reactions in Europe	Non-Technical careers in Aerospace	1-to-1 Sessions
Collaborative military programmes	Career paths: Where to next?	RAeS/Institution information
EYAP Forum launch and RAeS YM Awards reception (MOSI)		

Figure 1. The format of the CEAS 2009 Young Professionals Event, Manchester, 29 October 2009.

Four objectives:

- to stand as the foundation, and framework necessary for the professional collaboration between the European Young aerospace professionals with a global outreach;
- to help cater for the professional and career requirements of the European Young Aerospace Professionals (EYAP);
- to stand as a voice and representation of the European young aerospace professionals in matters concerning the European aerospace industry,also globally, and also feed the CEAS with the issues and concerns of the EYAP;
- to provide a benefit to the European aerospace industry and individual participants that is tangible and in excess of that which can be provided by current instruments.

Potential benefits of the EYAP Forum

Besides standing as the voice and representation of the European young aerospace professionals, as well as establishing and promoting avenues o collaborations between the EYAP forum members, the CEAS, other international organisations with the aim of enhancing knowledge transfer and playing a role in seeking solutions to career issues, the EYAP will offer personal benefits to individual members among others: relations; acquisition of new skills; constant information about the latest developments in the aerospace industries; opportunity for the members to showcase their work, talents and abilities to the European aerospace industry, and also to acquire a higher competitive advantage over non members counterparts...

Concept for EYAP Forum: 'Day One' Funtionality

At the present stage of CEAS 2009 Conference preparation, it is envisaged for this 'day one' that the EYAP forum is essentially focussed on an interactive website which will provide a platform for the dissemination of information on relevant news and events. Integral with the website will be an online discussion forum allowing members to meet and exchange information and views. Then subsequently to the forum launch, it will be of course necessary to go further and a programme of meetings, workshops and technical visits will be established.

FOR FURTHER INFORMATION, PLEASE CONTACT:
Stephen Liddle – RaeS, Chairman of the Young Members Board - Stephen.liddle@manchester.ac.uk
Henry Uyeme, EYAP Forum delivery manager - cougar_u@hotmail.com
Stuart Urquart, YP Conference delivery manager - stuart.urquart@thalesgoup.com

FINANCIAL REPORT

Antonio **Martin-Carrillo** presented the finance report: the situation of the CEAS at the end of the first quarter 2009 is sound and perfectly in line with the forecasts.

CEAS AWARD 2010

Ulf Olsson presented the results of the nomination process which had been conducted by the Awards Subcommittee during its meeting on 23 April 18:30, just before the welcome dinner.

Among four candidates, **Ernesto Vallerani** was selected to receive the CEAS Award 2010.

Prof. Ing. Ernesto Vallerani was in 1991-1996 President and Chairman of the Board of Alenia Spazio, in 1996-1998 President of space activities of Finmecanica-Alenia Aerospazio. In particular this last position, it is due to him the realisation of the logistic module for the International Space Station.

His contributions to the scientific community have been in his capacity of President the AIDAA and of President of the CEAS (1995 and 2001).

MEMBERSHIP

Ulf Olsson reported that the negotiations concerning Poland and Czech Republic are being pursued. François Gayet proposed the ASD's assistance for facilitating the contacts with the Czech Rep.

NOMINATIONS

Dr **Ulf Olsson**, who leaves the Board, was unanimously and warmly thanked for his total dedication to the development of the CEAS for many years. As VP for Awards & Membership, he is replaced by Dr **Kaj Lundahl**.

Dr **Joachim Szodruch** will remain VP for External Relations and Publications.

The successor of **Alain Garcia** as Chairman of the Aeronautics Branch will be designated at the next Board Meeting.

REPORT ON AERONAUTICS BRANCH ACTIVITIES

Alain Garcia presented a very detailed report on the Aeronautics Branch status, so that his successor will be in possession of a solid basis to proceed. President Szodruch wishes to thank him very much for his engagement and the great success he had in setting up the Aeronautics Branch.

The publication 'AVIATION TECHNOLOGY EUROPE' – a special CEAS issue of THE AERONAUTICAL JOURNAL (RAeS Journal) is in course of preparation. **Jean-Pierre Sanfourche** agreed to ensure the continuity of this action together with Alain Garcia.

THE ROYAL AERONAUTICAL SOCIETY'S ANNUAL CONFERENCE, 21-23 APRIL, RAES HEADQUARTERS, LONDON AEROSPACE 2009: FACING UP TO THE FUTURE

The RAeS's Annual Conference took place from 21 to 23 April 2009 in London, No. 4 Hamilton Place. It provided a major forum for the aerospace industry experts to address and discuss the key issues and provide real solutions to deal with an uncertain future.It covered a diverse portfolio of subjects related to the central theme '**Facing Up to the Future**'. Highlights of the Conference included the following:

On Day 1, the Air Power Day, ACM Sir **Glenn Torpy** GCB CBE, Chief of the Air Staff focused on the many challenges facing the UK Armed Forces both in their global role and dealing with threats to the UK. The keynote address was followed by a series of papers on the subject of Understanding the Strategic Requirement, chaired by Sir Kevin Tebbit KCB CMG Chairman of Finmeccanica UK.

On Day 2, Technology Day, the conference addressed the many ways in which innovation and technology can deliver substantial benefits to both Civil and Military aviation. Focussing on such key areas as fuel and engine efficiency, impact on the environment, Air Traffic Management, safety and security, the papers presented on Day 2 were an incredible combination of future technology and realistic solutions which clearly demonstrated how the aviation industry is ready to meet the immediate and future challenges it faces.

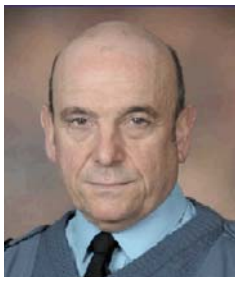
Day 3 of the conference focused on Civil Aviation and the need for a co-operative strategy between government and private enterprise. Many key points were covered but the major issues included: the current economic outlook for airlines; future technological developments in air traffic control; aviation and the environment; the future of Heathrow; the need for integrated transport networks; and transport from the passenger's point of view.

For a full list of speakers and more information on Aerospace 2009 – Facing Up to the Future visit www.aerosociety.com/annual.

Keynote Speakers

Air Chief Marshall Sir Glenn Torpy GCB CBE DSO ADC BSc(Eng) FRAeS FCGI RAF, Chief of the Air Staff.

Quentin Davies MP, Under Secretary of State and Minister for Defence Equipment and Support introduced discussion of A Strategy for Airpower.



Air Marshall Sir Stuart Peach, Chief of Joint Operations, spoke on Delivering the Effect.

David Way, Director of Knowledge Exchange & Special Projects, Technology Strategy Board spoke on the subject of Supporting the Future.

The Rt Hon Brian Wilson, Chairman, FlyingMatters introduced discussion of Developing a Cooperative Strategy for Sustaining Civil Aviation.

AGENDA OF THE MANCHESTER CONFERENCE

MONDAY 26 OCTOBER

14:00 Conference Welcome and launch Plenary Session

17:30 **Welcome Reception**

TUESDAY 27 OCTOBER

09:00 Plenary Session

11:00 **Parallel Sessions**
- Aerodynamics – Unsteady
- Aerodynamics – Flow Control
- Space – Plenary talks
- Structure & Materials – Manufacturing
- Human Factors – Man/Machine Interface
- Environment
- Air power
- Aerospace & Defence Knowledge Transfer Network session
- Management Studies

13:30 **Parallel Sessions**
- Aerodynamics – Unsteady
- Space – Aerothermics and Noise
- Space – Robotics
- Space – Education for Aeronautics & Space Engineering
- Propulsion – Computational Fluid Dynamics (CFD)
- Structure & Materials – Failures and Damages
- Human Factors – Selection and Development
- Environment
- Rotorcraft
- Unmanned Aerial Systems (UAS)
- Aerospace & Defence Knowledge Transfer Network session (cont'd)
- European Union (EU) Initiatives

15:30 **Parallel Sessions**
- Aerodynamics – Flow Control
- Space – Aerothermics and Noise (cont'd)
- Space – Robotics (cont'd)
- Space – Education for Aeronautics and Space Engineering (cont'd)
- Propulsion – Novel Powerplant Configurations
- Structures & Materials – Failures and Damages (cont'd)
- Human Factors – Cabin Environment
- Environment (cont'd)
- Rotorcraft (cont'd)
- Unmanned Aerial Systems (UAS) (cont'd)
- Aerospace & Defence Knowledge Transfer Network session (cont'd)
- European Union (EU) Initiatives (cont'd)

17:30 **Civic Reception at the Palace Hotel, Manchester**

WEDNESDAY 28 OCTOBER

08:30 **Parallel Sessions**
(some sessions start at 09:00)
- Aerodynamics – Flow Control & MAV
- Space – Satellite Components & Systems
- Space – Hypersonic Flow
- Space - Launch Technologies
- Propulsion – Fuel
- Vehicle design – Aerodynamics
- Structure & Materials - Design General
- Air Transport – Future Concepts
- Safety and Security
- Greener by Design
- Unmanned Aerial Systems (UAS)
- Societies Forum
- NODESIM workshop

13:30 **Parallel Sessions**
- Aerodynamics – High Speed
- Aerodynamics – Experimental
- Space – Satellite Components & Systems (cont'd)
- Space – Hypersonic Flow (cont'd)
- Space – Satellite Communications
- Propulsion –Simulation and Test
- Vehicle Design – Design Concepts
- Air Transport – Flight Operations
- Airworthiness and Maintenance
- Greener by Design (cont'd)
- Unmanned Aerial Systems (UAS) (cont'd)
- NODESIM workshop (cont'd)

19:00 **Conference Gala Dinner at the Concorde Suite, Manchester Airport**

AGENDA OF THE MANCHESTER CONFERENCE

THURSDAY 29 OCTOBER

08:30 **Parallel Sessions**
(some sessions start at 09:00)

- Aerodynamics – Computational Fluid Dynamics (CFD) and loads
- Space – Aerothermics and Noise
- Space – Space Technologies
- Space – Automated Transfer Vehicle (ATV) and Debris
- Aeroacoustics – Noise issues & Noise Measurements
- Air Transport – Air Traffic Management (ATM)
- Avionics & Systems – Simulation
- Omega
- Special Technology sessions
- Young Professionals – European Opportunity
- Young Professionals – Developing Professional
- NODESIM workshop

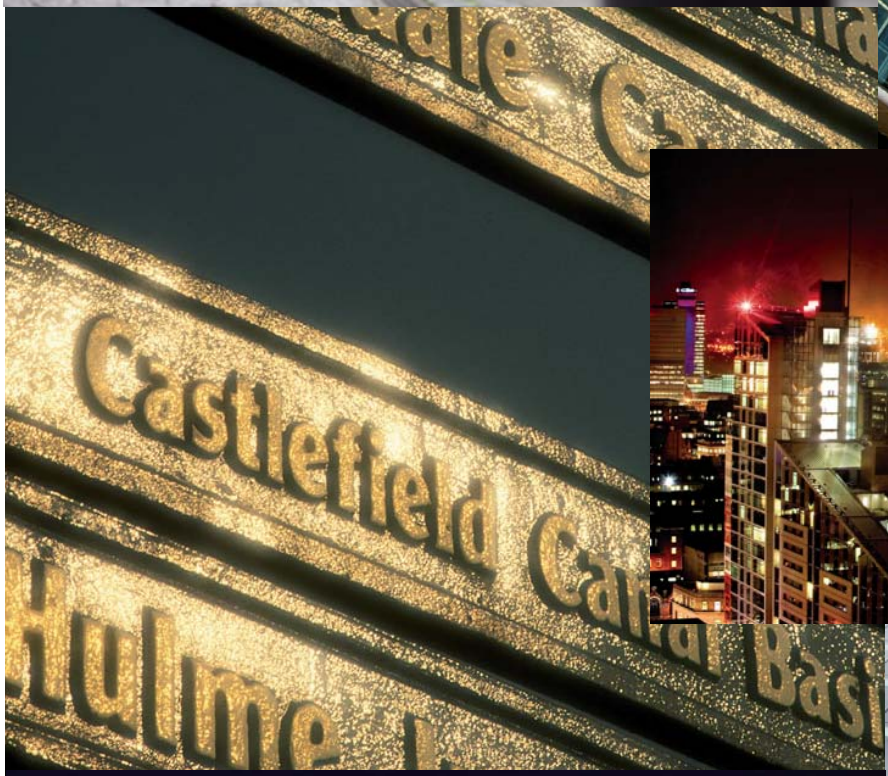
13:30 **Parallel Sessions**

- Aerodynamics – Loads
- Aerodynamics – Flight Performance
- Space – Aerothermics and Noise (cont'd)
- Space – Space Technologies (cont'd)
- Space – Automated Transfer Vehicle (ATV) and Debris (cont'd)
- Air Transport – Air traffic Management (ATM)
- Avionics & Systems – Flight Control
- Air Law Mock Trial
- Environment
- Young Professionals – European Opportunity
- Young Professionals – Developing Professional
- NODESIM workshop

FRIDAY 30 OCTOBER

08:30 **TECHNICAL TOURS OPTIONAL**


MANCHESTER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ARNDALE
HARVEY

The Quarterly Bulletin of the
COUNCIL OF EUROPEAN AEROSPACE SOCIETIES
THE AERONAUTICS BRANCH

AVIATION ALTERNATIVE FUELS: SNECMA AND CFM INTERNATIONAL AT THE CUTTING EDGE

Snecma has long focused on sustainable development and reducing pollutions of all kinds. When it develops its aircraft engines, it integrates a number of key factors: reducing fuel consumption and therefore greenhouse gas emissions, noise reduction and choosing both materials and manufacturing and maintenance processes that are kinder to the environment. As a member of the Advisory Council for Aeronautics Research in Europe (ACARE), Snecma is a major contributor to the Strategic Research Agenda (SRA), in particular coordinating the sections on the environment.
In order to go towards a further reduction in CO_2, alternative fuels could present complementary solutions: Snecma and partner General Electric are at the cutting edge in this research domain.

Basic Specifications

Alternative fuels, in fact the biofuels, would enable to answer simultaneously the concerns raised by:
– the obligation of CO_2 reduction to meet Kyoto requirements;
– the necessity to reduce fuel supply dependency;
– the necessity of ensuring engine sustainable production;
– possibly, fuel price increase.

These new fuels should present the following characteristics:
– compatibility with existing Jet A1 kerosene;
– ability to satisfy very complex specifications regarding energy density, thermal stability (avoiding cocking at high temperature), use at very low temperatures (freezing), or high temperatures;
– heating value (-10% leads to 10% more fuel consumption on a short range airplane);
– adaptability to airplane fuel system;
– chemical compatibility with materials (viscosity, spray capacity);
– lubricating effect with materials used;
– and last but not least, availability of mass production facilities worldwide.

First Generation of Alternative Fuels

Among the possible candidates for the first generation, were the fuels developed for cars, the bio-ethanol, the Ethyl-Tertio-Butyl-Ether (ETBE), the Fatty Acid Methyl Ester (FAME) also named 'Bio-Diesel'. The ratios between the heating values of these different biofuels and the one of kerosene go from 60% to 95% *(figure 1)*.

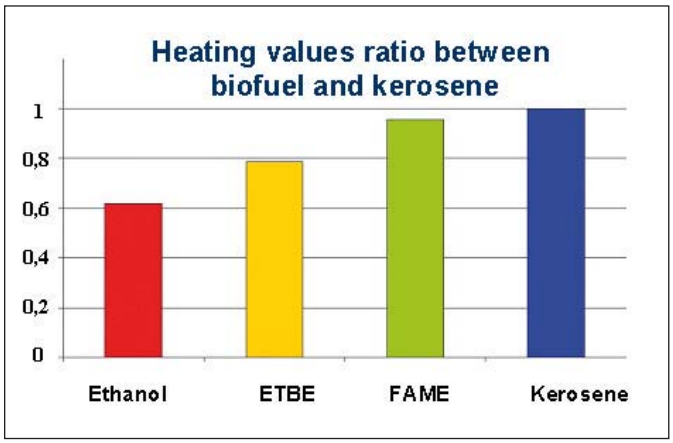


Figure 1. Heating values ratio between biofuel and kerosene.

Second Generation of Alternative Fuels

The ideal candidates will be: the synthetic kerosenes, from fossil coal, or methane, or renewable origin (biomass).
The synthetic kerosenes can be obtained from gasification and synthesis, by applying the Fischer Tropsch process which consists in converting CO and H_2 to liquid hydrocarbons or using the latest process to produce 'Hydro Renewable Jet Fuel' with lower CO_2 emissions during production. They can meet the JET A1 specifications with no or low sulphur or Hydrocarbon Aromatic Polycyclic (HAP) content. It may be necessary to bring some additives to restore the required lubricating level. Fuels obtained from biomass could be promising under the condition that its production is sustainable. Full well to wing analysis has still to be completed.

Alternative Fuels Research Programmes

Snecma is also participating in several research programmes concerning alternative fuels, at national level, with 'CALIN', and at European level with 'DREAM'.

DREAM

The objective is to demonstrate the ability to operate aircraft with the already existing alternative fuels. At the present stage of the studies, the choice of the fuel is not frozen yet. The final demonstration will be an endurance test performed on a Turbomeca helicopter in 2010.

CALIN and ALFA-BIRD

These programmes are dedicated to researches on third generation molecules for biofuels. Associated Research Laboratories and Oil Companies will develop these advanced molecules.

Figure 2. CFM Programme initiated in early 2007 on a CFM56-7 engine: the first test run at Snecma using a first generation alternative fuel.

Snecma will:
- verify the feasibility of the processes and advise on the applicability to aviation engine industry;
- participate in the tests of compatibility between the materials of the equipments (pumps, gauges,...) and the fuel;
- control the thermal stability;
- participate in the selection of the most promising solutions;
- express the necessary recommendations for new fuels specifications.

CFM Initiatives

CFM56 engines are produced by CFM International (CFM), a 50/50 joint company of Snecma SAFRAN Group and General Electric Company. CFM International is at the forefront of biofuels testing and is committed to supporting the development of sustainable biofuel sources that will have minimal or no impact on food crops or water resources, and do not contribute to deforestation.

15 JUNE 2007: CFM SUCCESSFULLY TESTS ESTER-BASED BIOFUEL ON CFM56-7B ENGINE

A first test run in June 2007 at Snecma using a first generation fuel ***(figure 2)***. The biofuel used was 30% vegetable oil methyl ester blended with 70% conventional Jet-A1 fuel. This test was designed to check the operation of a jet engine using a fuel made from biomass, without making any technical changes to the engine. With this type of biofuel, the target was a net reduction of 20% in carbon dioxide (CO_2) emissions compared with current fuels. This test was considered as positive and effectively marked a major step towards an ecologically friendly Jet engine.

FEBRUARY 2008: THE HISTORIC FIRST FLIGHT EVER FLOWN ON RENEWABLE FUEL

CFM completed several hours of ground testing at GE's outdoor Peebles, Ohio, facility in late 2007 on two alternate fuels: a Fischer-Tropsch synthetic fuel and an Imperium Renewables biofuel composed of babassu oil and coconut oil. In February 2008, this same Imperium fuel was then used by Virgin Atlantic to fuel one of the CF6 engines powering its own Boeing 747 aircraft on a flight from London to Amsterdam.

7 JANUARY 2009: CONTINENTAL AIRLINES DEMONSTRATES USE OF SUSTAINABLE BIO-FUELS AS ENERGY SOURCE FOR JET TRAVEL

On 7 January 2009, Continental Airlines (CAL) carried out the first demonstration in North America of sustainable biofuels used in a commercial jetliner ***(figure 3)***. Continental's Boeing 737-800, tail number 516, departed from and returned to Houston's Bush Intercontinetal Airport operated under a specially issued 'Experimental' aircraft type certificate, and carried no passengers.

The test flight, using a Boeing 737-800 powered by two CFM International CFM56-7B engines, used a 50/50 blend of biofuels and conventional Jet-A kerosene in the No 2 engine. The No 1 engine operated on 100% traditional jet fuel, allowing Continental to compare performance between the biofuel blend and traditional fuel. The biofuel used in engine No 2 was derived from algae and jatropha plants, two second-generation feedstocks. The algae oil has been provided by Sapphire Energy, and the jatropha oil by Terasol Energy. It is a 'drop-in' fuel, which necessitated no modifications, neither to the aircraft, nor to the engines.

During the flight, which lasted approximately two hours, Continental test pilots engaged the aircraft in a number of normal and non-normal flight manoeuvres, such as mid-flight engine shutdown and re-start, and power accelerations and decelerations. A Continental engineer recorded flight data onboard. No difference in performance between both engines was detected.

It is to be noticed that it was the first time a commercial carrier powered a flight using fuel derived in part from algae. A fuel blend such as this will contribute to a significant reduction in carbon emissions in comparison to traditional kerosene, since jatropha and algae consume carbon during their life cycle.

Presently, from January to September this year, Continental is actively participating with its partners in post-flight engine analysis to absolutely ensure that the effect on the engine and aircraft, in addition to performance, is substantially no different between biofuel and traditional fuel.

"This demonstration flight represents another step in Continental's ongoing commitment to fuel efficiency and environmental responsibility" [...] "The technical knowledge we gain today will contribute to a wider understanding of the future for transportations fuels." , said Larry Kellner, Chairman and Chief Executive Officer of Continental .

"Through their leadership Continental Airlines is helping aviation pioneer a greener, more diverse supply for the future", said Billy Glover, managing director, Environmental

Figure 3. 7 January 2009: flight demonstration of a biofuel by Continental Airlines. The pilots are being congratulated after the successful flight.

Strategy for Boeing Commercial Airplanes;
"With our proven technology and the commitment of aviation leaders like Continental and Boeing, sustainable biofuels for aviation are a real near-term option? We believe that production levels could reach hundreds of millions of gallons per year by 2012", said Eric Bachelet, President and Chief Executive Officer of CFM International.
"The simple combination of sunlight, CO_2 and algae to produce a carbon-neutral, renewable fuel source has the potential to profoundly change the petrochemical landscape forever", said Jason Pyle, Chief Executive Officer of Sapphire Energy.
"Jatropha is one of several next generation fuel sources that we are working on in order to develop sustainable, scalable and renewable alternatives to petroleum-based products", said Sangay Pingle, President, Terasol Energy.

CONCLUSIONS

The second generation biofuel being tested today comes closer to simulating the characteristics of traditional jet fuel in terms of engine performance and operability, such as fuel consumption, engine start and other parameters. Engines running this mix emit less smoke even than those fueled by traditional jet fuel. The recent research achievements put us closer to moving away from fossil fuels and energy dependency, and with no impact on the transportation infrastructure, food sources or the environment.
But for safety reasons, substantiation of a new fuel will be a long and costly process which will require a combined and perfectly coordinated effort from all aviation sector stakeholders: oil companies, aircraft manufacturers, engine manufacturers, research laboratories, Certification Authorities.

This article is the result of an interview of Francis Couillard, General Manager Environmental Affairs, Snecma SAFRAN Group, conducted by Jean-Pierre Sanfourche.

SNECMA, A WORLD-CLASS MANUFACTURER OF AEROSPACE PROPULSION

Snecma is an aircraft and rocket engines specialist. It designs, manufactures and supports engines for civil and military aircraft, launch vehicles and satellites. It is also a leader in MRO services and customer support for commercial and military aircraft engines. It is organised in four activities, distributed among eleven plants.

Four Activities

• COMMERCIAL ENGINES

Snecma and General Electric (GE) team up to produce CFM56 turbofans. Snecma is also a partner of GE on large turbofans: CF6, GE90, GP7200. It is addressing the regional aviation segment with the SaM146, developed jointly with Russian counterpart NPO Saturn. It is also aiming at the business aviation market with Silvercrest, a family of new-generation business jet engines.

• MILITARY ENGINES

Snecma3s engines power over 20 different types of military aircraft in about 40 countries. Its flagship products include: M53-P2 for Mirage 2000, M88-2 for Rafale, TP 400 for A400M.

• SPACE ENGINES

Snecma, lead propulsion company for Europe's Ariane launcher, develops and produces propulsion systems and equipment for launchers and satellites.

• SERVICES

Snecma provides a complete range of MRO and support services to airlines, operators and armed forces around the world.

A Proactive Environmental Policy

As a member of the ACARE (Advisory Council for Aeronautics Research in Europe), Snecma was a major contributor to the Strategic Research Agenda (SRA), in particular coordinating the sections concerning the environment. It pioneered various new technologies on commercial aircraft engines and is heavily involved in developing and applying new environmental standards.

Research

Environmental issues have become a political and economic challenge for the entire aviation industry. Snecma therefore devotes some 20% of its R&D budget to programmes desi-

gned to reduce environmental impact. The environmental research is largely defined by ACARE.

• CLEAN SKY

Budget: Euro 1.6 billion - 86 organisations from 16 nations – Six ground or air demonstrators ("Integrated Technology Demonstrators" – ITDs) will be produced: three concern the aircraft itself, two deal with cross-functional isues – sustainable and green engines and systems), one concerns the life-cycle of aircraft.

• VITAL

VITAL aims at reducing perceived engine noise by 6 dB and CO_2 emissions by 7%. This is a 4-year programme with Snecma leading 53 partners including all major European engine manufacturers.

• NEWAC

This project focuses on the engine core, or high-pressure section. It aims to demonstrate technologies that will reduce engine emissions of CO_2 and NOx.

ABOUT THE « SINGLE EUROPEAN SKY »

After the positive vote by in the European Parliament, the Transport ministers confirmed on 30 March 2009 the agreement reached on the Single European Sky package. The latter, which will be formally adopted by the Council very soon, strengthens the 'Single European Sky', makes the European Aviation Safety Agency (EASA) responsible for all safety links of the aviation chain and boosts the implementation of new technologies. As a package, the measures will deliver safer, greener and more cost-efficient flights. Annual savings for the airlines is calculated around Euro 4 bn. At the same time the Air traffic Management (ATM) Master Plan will put the European manufacturing industry at the forefront of innovation in air traffic management technology, thus delivering a performing European infrastructure and giving manufacturers a competitive edge on global markets.

FOUR PILLARS

FIRST PILLAR: LEGISLATION

This pillar introduces several enhancements to the original Single European Sky legislation, including binding performance targets for air navigation service providers, European network management functions to ensure convergence between national networks and a definitive date for Member States to improve performance, including through a process of enhanced cooperation and further integration of air navigation service providers, known as 'Functional Airspace Blocks'.

SECOND PILLAR: TECHNOLOGY

This pillar focuses on introducing state-of-the-art technology. The SESAR (Single European Sky Advanced Research) programme brings together all aviation stakeholders to develop, validate and deploy a new generation, Europe-wide air traffic management system.

THIRD PILLAR: SAFETY

This pillar provides for increased responsibilities for the EASA (European Aviation Safety Agency). This should ensure precise, uniform and binding rules for airport operation, air traffic management and air navigation services, as well as sound oversight of their implementation by the agency with a more comprehensive control on European aviation safety, and ensure that common safety rules are applied in all phase of flight, staring from the tarmac.

FOURTH PILLAR: AIRPORT CAPACITY

This pillar tackles the shortage of runways and airport facilities, which currently threatens to become a major bottleneck. The initiative seeks to co-ordinate better airport slots issued to aircraft operators with air traffic management measures as well as the establishment of an airport capacity observatory to fully integrate airports in the aviation network.

ENVIRONMENTAL ISSUES AT THE CORE OF THE SINGLE EUROPEAN SKY

Improved air traffic management aims at reducing greenhouse gas emissions from aviation. Prospective improvements are up to 10% per flight, which amounts to 16 million tonnes of CO_2 savings per year and annual cost savings for airspace users of Euro 2.4 bn. This will put aviation in a position to deal with its integration in the European Emission Trading Scheme.

A STATEMENT REGARDING HUMAN FACTOR

Given the central human factor in air navigation service provision, the European institutions have also adopted a statement to declare their willingness to work jointly to involve staff into the implementation of the aviation package, to ensure high standards of competence of all categories of personnel delivering safety and to boost confidence in incident reporting mechanisms.

From European Commission
Press Release IP/ 09/501 dated 30 March 2009.

POLICIES TO REDUCE THE CLIMATE IMPACT ON AVIATION NOX EMISSIONS

A very important report entitled 'Lower NOx at Higher Altitudes – Policies to reduce the climate impact on aviation NOx emissions' has been published in October 2008 by the Directorate - General Energy and Transport of the European Commission. This report is the result of a research project contract of the EC. It has conducted a thorough review of the scientific evidence, NOx inventories and NOx regulations, NOx formation and control technologies, and the regulatory framework regarding aviation NOx emissions. An abstract of this document is given here below.

THE SCIENTIFIC EVIDENCE

There is robust scientific evidence that NOx emissions from the current aviation fleet contribute to global warming. Aviation NOx emissions at cruise altitudes result in an enhancement of ozone O_3 in the upper troposphere and lower stratosphere and the destruction of a small amount of ambient methane CH_4, of the order of approximately 1-2% of the background concentrations. The enhancement of O_3 results in climate warming whereas the reduction in CH_4 is a cooling effect.

The contribution is significant and stronger in the northern hemisphere. The combined O_3+CH_4 radiative forcing is positive in the northern hemisphere and negative in the southern hemisphere.

However, there is no agreement on the value of a policy-relevant metric to relate the climate impact of NOx to the impact of other compounds.

A concerted effort may yield a Global Warming Potential (GWP) value of aviation NOx in about three years. What is needed is a mobilization of the international scientific community and a coordinated set of experiments performed so that a robust, consensus analysis of aviation NOx GWPs can be undertaken. This is a top priority.

REVIEW OF NOx INVENTORIES AND NOx REGULATION

Aviation emitted an estimated 1.7 to 2.5 Tg NOx (as NO_2) per year around 2000 (1Tg= 1000 billion grammes). This report estimates that emissions within, and on flights to and from the European Union accounted for 42% of this total in 2000.

Emissions are forecast to increase considerably in the future. Up to 2020, they are expected to double relatively to 2000 levels and by 2050, they could have increased by a factor six in the case nothing would be done. If the environmental impacts of the inclusion of aviation in the EU EU Emission Trading Scheme (the ETS is the EC Directive establishing a scheme for greenhouse emission allowances) are taken into account, as well as the full benefits of the Single European Sky, and if the research targets of ACARE (Advisory Council for Aeronautics Research in Europe) are met, resulting in the introduction of new aircraft and engine types in the fleet, the emission increases will be significantly reduced: 6-9% lower than the baseline in 2020, around 50% lower in 2050 relative to the factor six assumption.

Landing and Take-off (LTO) NOx emissions of jet engines (with the exception of the smallest engines) are regulated by global standards set by the ICAO (International Civil Aviation Organization), expressed in mass of NOx emitted by kN of thrust at maximum static sea level thrust.

Despite more stringent LTO NOx standards, there has been little progress in the reduction of NOx emissions per seat kilometre offered. Aircraft and engines have become more fuel efficient in the last decades partially because of higher pressure and by-pass ratios in the engines so that EINOx - the Emission Index of NOx expressed in grammes of NOx emitted per kg of fuel burnt - , has increased as permitted by the ICAO standards. Result: the combination of the downward trend in fuel use per seat kilometre and the upward trend in EINOx gave an almost constant mass of NOx per seat kilometre.

REVIEW OF NOx FORMATION AND CONTROL TECHNOLOGIES

For current technology engines, lower LTO (Landing and Take-Off) emissions result in lower NOx emissions in cruise. For future technology engines, the correspondence between LTO NOx emissions and cruise NOx emissions may break down. NOx emissions cannot be monitored in situ but modelling of emissions is possible in principle.

There is a good correlation between modelled cruise NOx emissions and LTO emissions times a distance factor. So, it could be possible in principle to use publicly available data on LTO NOx emissions to approximate cruise NOx emissions.

POLICY INSTRUMENTS TO REDUCE THE CLIMATE IMPACT OF AVIATION NOx EMISSIONS

Drawing on a long list of 15 policy options, six have been selected for further design and analysis after abroad evaluation and stakeholder consultation: LTO NOx charge, LTO NOx charge with a distance factor, cruise NOx charge, including aviation NOx allowances in the EU ETS, ICAO LTO NOx emission standards, a precautionary emissions multiplier on CO_2 allowances in the EU ETS.

1. AN LTO NOx CHARGE

An LTO NOx charge based on estimates of LAQ (Local Air Quality) damage costs would reduce aviation NOx emissions

by up to 0.5% relative to the baseline. In addition it would incentivise engine manufacturers to reduce LTO NOx emissions.

2. AN LTO NOx CHARGE WITH A DISTANCE FACTOR

An LTO NOx charge with a distance factor would target cruise NOx emissions and hence its climate impact indirectly. The basis of the charge would be the mass of LTO NOx emissions calculated and the great circle distance between the departure airport and the airport of destination. The level of the charge would be related to the climate damage costs of NOx, taken to be the GWP (Global Warming Potential) of NOx times the average cost of emission allowances in the EU ETS. The administration of such a charge could be entrusted to EUROCONTROL. Such a charge could reduce aviation NOx emissions by up to 3.1% in 2020. As with an LTO NOx charge, it would incentivise engine manufacturers to reduce LTO NOx emissions.

3. A CRUISE NOx CHARGE

A cruise NOx charge would be directly aimed at cruise NOx emissions and thus the climate impact of aviation NOx. Its implementation would require building a database to calculate cruise NOx emissions per aircraft-engine combination and flight distance. Its administration could be organised in the same way as an LTO NOx charge with a distance factor. It could reduce aviation NOx emissions by up to 2.8% in 2020 and would incentivise engine manufacturers to reduce cruise NOx emissions.

4. INCLUDING NOx ALLOWANCES IN THE EU ETS

Requiring aircraft operators to surrender NOx allowances in the EU ETS for their emissions would target cruise NOx emissions and hence its climate impact indirectly. Such a measure could reduce aviation NOx emissions by up to 2.8% in 2020 and would also incentivise engine manufacturers to reduce NOx emissions.

5. ICAO LTO NOx EMISSION STANDARDS

ICAO (International Civil Aviation Organization) LTO NOx emission standards have been the predominant instrument for decades to reduce LTO NOx emissions. Increased stringency of them could reduce aviation NOx emissions by 2.3% to 5.2% in 2020.

6. PRECAUTIONARY EMISSIONS MULTIPLIER

A precautionary emissions multiplier could reduce aviation NOx emissions by 4.7% in 2020 maximally.

Overall conclusion

It will take three to five years to design policy instruments that are both well founded in scientific evidence and provide the right incentives to reduce emissions both in the short term and in the long term. The two main issues that will have to be resolved before such an instrument can be developed are:

- ***establish a value for a policy-relevant metric for aviation NOx climate impact;***
- ***either establish a way to model cruise NOx emissions or establish the correlation coefficient between LTO and cruise emissions***

This report has been prepared for the EC, Directorate-General Energy and Transport under the contract TREN/07/F3/S07. 78699.
Romy Rohart was the EC Project Officer.
The authors of the Report are: Jaspel Faber, Dan Greenwood, David Lee, Michael Mann, Pablo Mendes de Leon, Dagmar Nelissen, Bethan Owen, Malcolm Ralph, John Tilston, André van Velzen, Gerdien van de Vreede.
CE Delft – Oude Delft 180 – 2611 HH Delft – NL
Tel.: +31 15 2150 150
www.ce.nl
www.ec.europa.eu/transport/air/index_en.htm

FROM THE EUROPEAN AVIATION SAFETY AGENCY – EASA

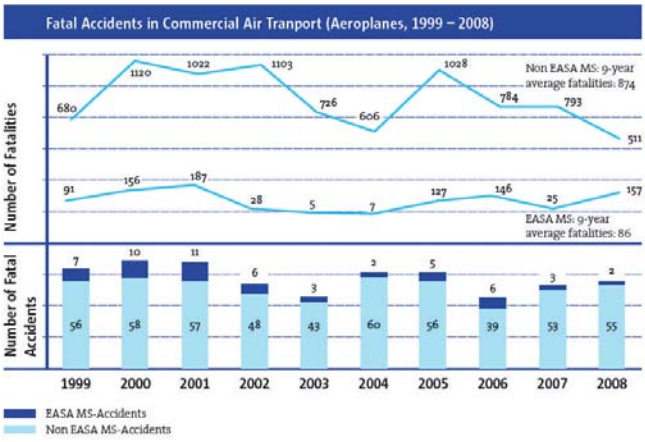
EASANEWS

The EASA has recently created a quarterly publication, the 'EASANEWS', the number one of which appeared in last February. Among the subjects dealt with, two are summarized here below.

2008 SAFETY REVIEW SHOWS MIXED RESULTS

Every year, the EASA produces its Annual Safety Review to inform the public of the general safety level in Europe (Europe or the EASA Member States – 'EASA MS' - are considered as the 27 EU Member States plus Iceland, Liechtenstein, Norway and Switzerland). The European fatal accidents are compared with the worldwide accidents which are the sum of 'EASA MS'+ Non EASA MS'. 2008 was a mixed year for safety aviation in Europe.

The graphic shown in page 17, concerning fatal accidents in commercial air transport – aeroplanes – from 1999 to 2008, calls for the following comments:
– In 2008, 2 fatal accidents occurred in Europe, to be compared with the total of 57 in the world, i.e. less than 4%. But the number of fatally injured people on board 157, was above the average of the previous nine years, 86. This is mainly due to



the tragic accident of the McDonnell Douglas MD-82 aircraft on 20 August 2008 in Madrid, which crashed during take-off killing 157 passengers. The 2nd accident concerned an Airbus A320 in Honduras that overran the runway during landing (this aircraft was operated by an airline from outside Europe but it was registered in one of the EASA MS).
– Regarding 'non EASA MS', 55 crashes occurred leading to 511 losses of life, a number well below the nine-year average, 811.

DITCHING!

Since 15 January 2009, the prospect of an aircraft ditching should not be viewed with quite the same foreboding.

The possibility of a water landing, although exceedingly unlikely, has been considered very carefully in the development of EASA rules that aircraft designers and operators must follow. The safety regulations of aircraft design and the technologies

Everybody has still in mind this extraordinary picture showing the succeful ditching of a civil transport aircraft on the Hudson River, New York: 15 January 2009.

developed by manufacturers and airlines have reached very high levels of maturity, thus the need to land away from an airport is now no more than a faint possibility. Nevertheless, the enormous size of the air travel industry means that this may occasionally happen.
The EASA regulations are in place to provide those involved in a water based event the best chance of coming through unscathed. Real life testing of these regulations' effectiveness is thankfully a remote occurrence. EASA's stock of knowledge in this regard has recently increased, the more so as investigation of the New York accident progresses. EASA will naturally be looking for all possibilities to learn valuable lessons and improve still further the state-of-the-art where appropriate.

JPS – From EASANEWS #1, February 2009.
EASA Ottoplatz, 1 D-50679 Cologne.
www.easa.eu.int

THE IMPACT OF FLIGHT SIMULATION IN AEROSPACE

The Royal Aeronautical Society (RAeS) has published in last March a discussion paper entitled: 'The impact of flight simulation in aerospace'. The reading of this paper is highly recommended to aircraft designers, pilot trainers and pilots. The short article here below only aims at giving the reader an idea of the main messages it contains.

EVOLUTION

Flight simulation has not only radically changed flight training methods, reducing the training risk and improving training quality; it has also resulted in significant improvements in flight safety, alleviating airborne congestion and the impact of the aviation on environment, while reducing the cost of training.

EFFECTIVENESS OF FLIGHT SIMULATORS

To be trained in a flight simulator can more effective than to be trained in an aircraft. High levels of training transfer can be achieved with low-fidelity devices. For some simulators, all the flight-crew training can be conducted in the simulator.

BENEFITS

Flight simulation has made a major contribution to improve aviation safety. It also offers considerable financial saving to airlines and reduces the environmental impact of civil aviation. Military pilots can practice for situations that would be impractical in airborne training exercises. Recent military

operations, together with public concern over environmental issues, increasingly complex weapon systems and the risks to flight crews, have convinced the armed forces of the compelling case for flight simulation *(figure 1)*.

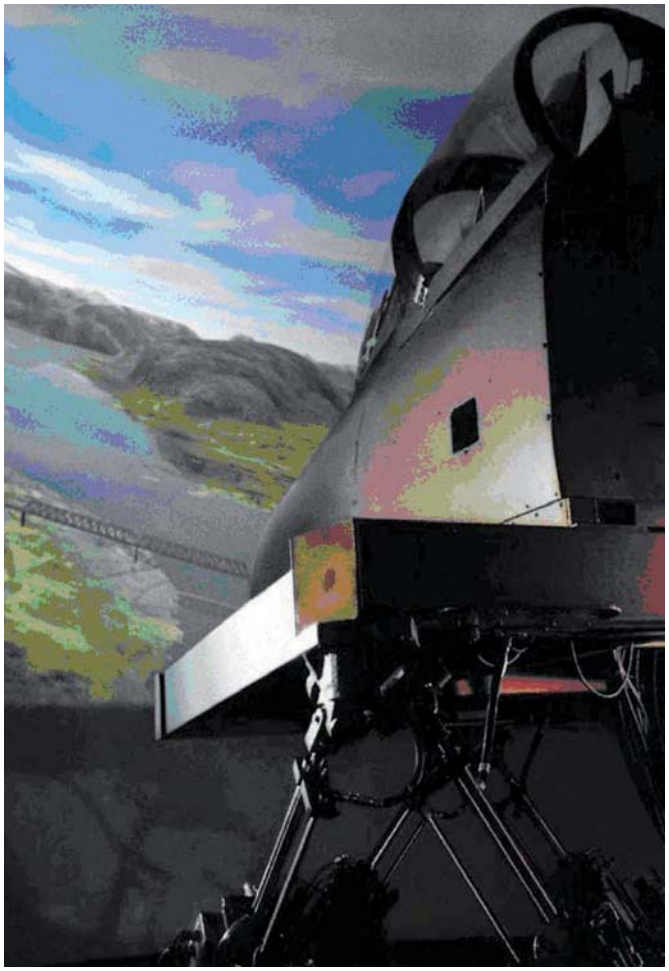


Figure 1. A military flight simulator

TECNOLOGY DRIVE INDUSTRY

Flight simulation is at the leading edge of several technologies, particularly in computer graphics, distributed computing and mechanical actuation.

FLIGHT SIMULATORS IN RESEARCH & DEVELOPMENT

The modern aircraft is a systems platform. Flight simulation offers major advantages in designing and developing aircraft systems to analyse designs and to assess system performance prior to airborne trials. These concepts, named 'Synthetic Environments' (SEs), may be applied to the whole life cycle of a system or platform from initial concept through design and production to flight test and service use.

THE UK FLIGHT SIMULATION CAPABILITY

Flight simulation plays an increasingly important role in the UK aerospace industry. Since 2000, the number of civil flight simulators in the UK has increased by 27%. There were a further 55 flight simulators in training centres for the Royal Navy, the Army and the RAF. Flight simulation research at the Defence Science & Technology Laboratory (Dstl) and QinetiQ provides support for the UK armed forces.

THE FUTURE OF FLIGHT SIMULATION

Flight simulation is a fast advancing set of technologies in a fast expanding area of aviation. As the cost of computers falls and their capabilities grow, the scope and application of flight simulation are likely to expand at a dramatic rate.
Simulation will become pervasive in many industries and simulators will become essential tools to increase capability and reduce development costs.
Flight simulation is becoming recognised as a major discipline of aerospace.

THE ROLE OF THE RAeS

The RAeS Flight Simulation Group plays a significant international role in bringing together manufacturers, operators and the regulatory authorities to progress important initiatives anf formulate policy.
The Discussion Paper here above presented has been written by this Group.

FOR FURTHER INFORMATION, PLEASE CONTACT:
RAeS – No. 4 HAMILTON PLACE,
LONDON W1J 7BQ,UK. - +44 (0) 20 7660 4300
www.aerosociety.com

HERSCHEL AND PLANCK : En route to the ORIGINS of the UNIVERSE

In the CEAS Bulletin No 1-2009, a general description of the satellites Herschel and Planck was given in anticipation of their launch. The latter took place on 14 May 2009 afternoon and was perfect. Both of these highly sophisticated spacecraft were lofted into space atop an Ariane 5 ECA from Kourou at 13:12 UTC (15:12 CEST).

Figure 1. 14 May 2009, 13:12 UTC: Herschel and Planck are lofted into space atop an Ariane 5 ECA from Europe's Spaceport in Kourou, French Guiana.(Credit ESA/ CNES/ARIANESPACE)

TOWARDS L2

Both of these highly sophisticated spacecraft, almost 26 minutes after the launch and about two minutes from each other, were released separately on an escape trajectory towards a virtual point in space, the second Lagrangian Point called L2, which is located at 1.5 million km away from the Earth, in the opposite direction to the Sun. They are currently on a highly elongated orbit that will bring them to an average distance of 1.5 million km.

In approximately two months, they will begin their first scientific observations from two separate orbits around L2, where the combined pull of the Earth and Sun creates a gravitational stability point. Once there, undisturbed by thermal and radiation interference caused by the Sun, the Earth and the Moon, they will be in ideal conditions to perform their respective missions.

HERSCHEL

Herschel will observe pre-selected targets, in order to investigate the history of how stars and galaxies formed and to study how they continue to form in our own and other galaxies. It will observe at wavelengths never covered until today, from far infrared to sub-millimeter wavelengths.

" With Herschel, we can resume the pioneering work undertaken with ISO, first ESA's infrared space observatory in the second half of the 90's, and we are building upon the experience gained to date by the world wide scientific community in the field of infrared astronomy.", said David Southwood, ESA Director of Science and Robotic Exploration.

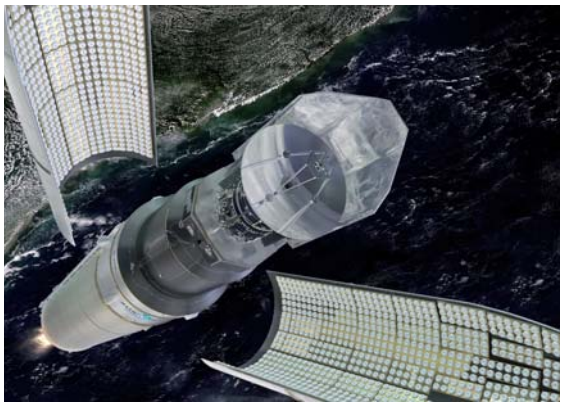


Figure 2. Herschel-Planck fairing ejection: an artist's view. The boosters of Ariane 5 fired for # 2.5 minutes and its main and upper stage engines for # 25 minutes, setting both satellites on the path to L2. This illustration shows the fairing of Ariane being ejected, with Herschel visible on top of Planck. (Credit ESA image by AOES Medialab)

PLANCK

Planck will perform a continuous survey of the overall sky. It is the first mission of which is to study the relic radiation from the Big Bang – 13,6 thousand million years ago –, so continuing the work undertaken over the last two years by Russia's Relikt, and NASA's COBE and WMAP satellites. It will have enough sensitivity to reach the experimental limits of what can be observed, thus peering into the early Universe and studying its constituents such as the elusive matter and dark energy that continue to be a puzzle to the science community.

THE MOST COMPLEX SCIENCE SATELLITES EVER BUILT IN EUROPE

They were developed by under a common engineering programme by an industrial team led by Thales Alenia Space France, mainly supported by Astrium Germany, Astrium Toulouse and Thales Alenia Space Italy. It comprised more than 100 contractors from 15 countries in Europe and the USA. The instruments on both satellites, and the Planck telescope, were provided by large consortia from across the world. Leading institutes are: SRON (Netherlands), Max Planck Institute for Extraterrestrial Physics (Germany), Cardiff University (United Kingdom), Institut d'Astrophysique Spatiale (France), the Istituto di Astrofisica Spaziale e Fisica Cosmica (Italy), Danish Institute. A major contribution was also brought by scientific institutions in other countries such as the USA and Canada.

FROM ESA PRESS RELEASE NO 10-2009.
FOR FURTHER INFORMATION: www.esa.int/Herschel and www.esa.int/planck

IN THE AFTERNOON OF 17 MARCH: SUCCESSFUL LAUNCH OF GOCE

Lift-off of GOCE, 17 March 2009, 14:21 GMT, from the Plesetsk Cosmodrome in Russia. (Credit ESA)

In the afternoon of 17 March, the Gravity field and steady-state Ocean Circulation Explorer (GOCE) satellite developed by the European Space Agency (ESA) was lofted into a near-sunsynchronous, low Earth orbit by a Rockot launcher lifting - off at 14:21 GMT from the Plesetsk cosmodrome in northern Russia. With this launch, a new chapter in the history of Earth observation in Europe has begun. As a matter of fact, GOCE is the first of a new family of ESA satellites designed to study our planet and its environment in order to enhance our knowledge and understanding of Earth-system processes and their evolution, enabling us to address the challenges of global climate change.

THE LAUNCH

The Russian Rockot launcher is derived from a converted ballistic missile. The launch was procured from Eurockot Launch Services, a German-Russian company based in Bremen, Germany. The launcher lifted-off at 14:21 GMT and flew northward over the Arctic. After 90 minutes later, after one orbital revolution and two Breeze-KM upper stage burns, the 1052 kg spacecraft was successfully released into a circular polar orbit at 280 km altitude with 96.7° inclination to the Equator.

Contact with GOCE was established via ESA's tracking station in Kiruna, Sweden, shortly after separation. The satellite is from this time under the control of ESA's teams at the European Space Operations Centre in Darmstadt, Germany.

THE MISSION

GOCE is ESA's first science mission satellite dedicated to Earth observation since Envisat in 1992. The size has changed, but the rationale remains the same: to provide the best science our technology can deliver for the maximum benefit of the science community.

GOCE was selected in 1999 as the first Earth Explorer Core Mission within the framework of ESA's Living Planet Programme.

For 24 months GOCE will have to collect three-dimensional gravity data all over the globe. In particular it will measure minute differences in the Earth's gravity around the globe. The raw data will be processed on the ground to produce the most accurate map of the Earth's gravitational field to date and to refine the geoid, which is the actual reference shape of the Earth. Why to refine the geoid? Because precise knowledge of the latter, which can be considered as the surface of an ideal global ocean at rest, will play a very important role in further study of our planet, its oceans and atmosphere. It will serve as the reference model for the measurement and modelling of sea-level change, ocean circulation and polar ice cap dynamics.

THE PAYLOAD

THE ELECTROSTATIC GRAVITY GRADIOMETER

The main payload instrument is a state-of-the-art Electrostatic Gravity Gradiometer (EGG) incorporating six highly sensitive accelerometers, mounted in pairs along three perpendicular axes on an ultra-stable carbon-carbon structure. The instrument has to measure not gravity itself but the tiny differences in gravity between the accelerometers pairs 50 cm apart. The data collected yield accuracy of 1 to 2 cm in the geoid altitude and 1 milligals for the detection of gravity-field anomalies: mountains, for instance, usually cause local gravitational variations ranging from tens of milligals to approximately one hundred. The spatial resolution is improved from several hundreds or thousands of kilometres on previous missions to 100 km with GOCE. Each accelerometer will detect accelerations to within 1 part in 10 000 000 000 000 of Earth's surface gravity.

GPS RECEIVER

To ensure such precise accurate measurements, the satellite's position must be precisely known at all times, this is the reason why the payload is equipped with a GPS receiver. The positions provided via the latter also supply gravity information data through analysis of the perturbations in the orbit. The GPS receiver is in fact used as a Satellite-to-Satellite Tracking Instrument which supplements the gradiometer measurements.

A LASER RETROREFLECTOR

A Laser Retro Reflector allows the precise orbit to be tracked by a global network of ground stations through the Satellite Laser Ranging Service.

AN AERODYNAMIC SHAPE DESIGN

In order to get the best possible performances from the gradiometer, the spacecraft has been designed to provide a highly stable and undisturbed environment, despite its low-altitude orbit which forces it to endure slight but significant drag from the uppermost layers of the atmosphere. This is the main reason for its slender 5 metre-long arrowhead aerodynamic shape design.

STRUCTURE AND DESIGN

The spacecraft's structure and design have been optimized to filter out all kinds of disturbance, by using ultra-stable materials to limit thermal cycling effects, without any deployable or moving parts.

TWO LOW-POWER XENON ION ENGINES

These two thrusters, one primary and on back-up, each able to deliver 1 to 20 milli-Newtons are being used to make real-time compensation for atmospheric drag, based on the mean acceleration detected by the two accelerometers mounted on the velocity axis.

ONE MISSION, MANY BENEFITS

From 17 March till the end of May, the teams of ESA and its industrial partners are checking and commissioning GOCE. The spacecraft will then be transferred to its operational altitude and its payload will undergo a further six weeks of commissioning and calibration. Missions operations are scheduled to start in summer 2009.
The mapping of the Earth's gravity field with such accuracy will benefit all branches of Earth science.

GEODESY

GOCE will provide a unified reference model for height measurements worldwide, eliminating discontinuities between height systems for the various landmasses, countries and continents. This will enable better surveying of sea-level change, allowing scope to revisit a 200 year-plus history of recorded sea levels around the globe.

OCEANOGRAPHY

A better knowledge of the gravity field will significantly reduce current uncertainties regarding ocean heat and mass transfer, which will translate into tremendous improvements to global ocean-circulation and climate-forecasting models. GOCE will also improve our knowledge of the polar cap bedrock in Greenland and Antarctica. The precise geoid map will enable better determination for satellites monitoring the ice sheet and thus increased measurement accuracy.

GEOPHYSICS

Combining GOCE's results with magnetism, topography and seismology data will help produce 3D mapping of density variations in the Earth's crust and upper mantle. This will be a major contribution to the improvement of all modelling of sedimentary basins, rifts, tectonic movement and sea-land vertical change, enhancing our understanding of the processes responsible for natural Hazards.

ONE EARTH EXPLORER UP, MORE TO COME

The launch of GOCE marks the dawn of a new generation of Earth scientific satellites in Europe. It is the first of a new generation of small, dedicated science satellites and it paves the way for more Earth Explorer missions. The ESA's Living Planet Programme initiated in 1999 aims at fostering research on the Earth's atmosphere, biosphere, hydrosphere, cryosphere and interior, their interaction and the impact of human activities on these natural processes.

ADM-AEOLUS AND EARTH CARE

Two more Core Missions of "Living Planet" are already under development:

- ADM-Aeolus for atmospheric dynamics – 2011 -;
- EarthCARE to investigate the Earth's radiative balance – 2013 -.

THREE SMALLER MISSIONS

Three smaller Earth Explrer Opportunity Missions are also under preparation:

- CRYOSTAT 2 to measure ice-sheet thickness – 2009 -;
- SMOS to study soil moisture and ocean salinity – 2009 -;
- SWARM to survey the evolution of the magnetic field – 2011 -.

As part of ESA's Living Planet programme, the Gravity field and steady-state Ocean Circulation Explorer(GOCE) will be the first of a series of Earth Explorer satellites in orbit, designed to provide information for understanding critical Earth systems variables. (Credit ESA)

SMOS, THE NEXT EARTH EXPLORER SATELLITE READY FOR LAUNCH IN SEPTEMBER 2009

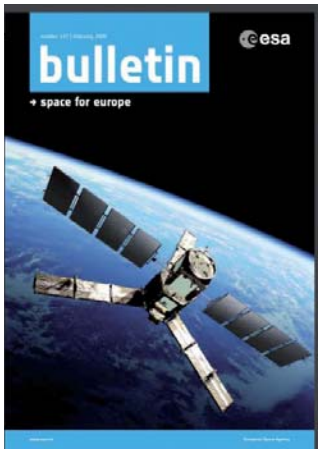


Figure 1. A view of the SMOS satellite which will be launched in next September. This satellite consists of a generic platform called Proteus, provided by CNES, France, that carries a Microwave Imaging Radiometer using Aperture Synthesis developed by EADS-CASA Espacio, Spain. (Credit ESA)

The Soil Moisture and ocean Salinity (SMOS) mission is the next Earth Explorer in line for lift-off after the successful launch of the Gravity field and sready-state Ocean Circulation Explorer on 17 March 2009. Following confirmation from Eurockot Launch Services that they will launch ESA's SMOS mission on 9 September 2009, the satellite has been taken out of storage at the end of April. After being in storage at Thales Alenia Space in Cannes, France, for almost a year, SMOS has been unveiled and presented to the media on 24 April.

THE TWO BASIC SMOS MISSIONS

OBSERVATIONS OF SOIL MOISTURE

These observations will further our knowledge of processes in the water and energy fluxes at the land surface/atmosphere interface and will provide information on storage of water, water uptake by vegetation, fluxes at the interface and the effect of these on water run-off. This knowledge is important to improve meteorological and hydrological modelling and forecasting, water resource management and monitoring of plant growth. It also contributes to the forecasting of hazardous events such as floods.

OCEAN SALINITY

Ocean salinity is a key variable in characterising global ocean circulation and its seasonal and inter-annual variability: it is an important constraint in ocean-atmosphere models. SMOS observations will improve seasonal-to-inter-annual climate predictions, e.g. for the El Nino Southern Oscillation, and the estimates of ocean rainfall and thus the global hydrologic budgets. In addition they will aid the monitoring of large-scale salinity variability, which is needed to better understand and characterise the distribution of bio-geochemical parameters in the ocean's surface and upper layers.

So, for the first time we will receive global information from space about soil moisture over land and sea-surface salinity over the oceans.

THE SMOS SPACECRAFT

SMOS consists of a generic platform called "Proteus" provided by CNES (Centre National d'Etudes Spatiales) that carries a novel instrument, the Microwave Imaging Radiometer using Aperture Synthesis (MIRAS) developed by EADS-CASA Espacio in Spain. This MIRAS instrument operates in the microwave 'L band' frequency range at 1.4 GHz, and measures brightness temperatures as a function of polarisation and angle. It applies the technology of interferometry to provide a spatial resolution suitable for the global measurements wanted.

SMOS is the first satellite mission to carry a polar-orbiting 2D interferometric radiometer.

A number of technical challenges had to be overcome to make the concept work:

- the 69 individual receivers that form the elements of the interferometric array must be as 'identical' as possible in their amplitude over frequency responses;
- for all receivers, the sampling time has to be the same within 0.5 nanosecond, which implies the first-ever use in space of a distributed fibre harness;
- the three arms that accommodate the rows of receivers each span more than 4 metres; they can only be carried on the satellite if folded during launch and deployed once arriving in orbit.

THE LAUNCH

The spacecraft SMOS will be placed in orbit by a Rockot launcher which will be lifted-off from the Plesetsk cosmodrome in northern Russia.

AN INTERAGENCY CO-OPERATION

With the Envelope Programme allowing interagency cooperation, SMOS has been conceived as a cooperation between ESA, the French space agency (CNES) and the Spanish space agency (CDTI).

The CNES cooperation comprised the provision of a suitably adapted recurrent 'PROTEUS' platform and its generic flight operations ground segment.

The contribution of CDTI included funding for the payload ground segment and also for the space segment through ESA's General Support Technology Programme.

ESA and CNES shared equally and managed the works of system engineering and satellite assembly, integration and

testing, up to and including the launch campaign.
CNES will operate the satellite and supporting ground segment throughout its mission lifetime, while ESA will maintain the overall management responsibility for the mission and its operations.

PREPARING FOR THE COMMISSIONING PHASE

Whilst SMOS is readied for launch, the 'finishing touches' are being made to the data-processing ground segment at ESAC, Spain. The tuning of the processors is being optimized in view of the commissioning phase.
A large number of scientific groups are preparing for the calibration and the validation of the awaited data from SMOS. This comprises a variety of measurement efforts over land and sea, such as field campaigns to deploy moisture probes and radiometers, buoys with salinity sensors, or airborne campaigns carrying instruments providing measurements similar to the ones expected from MIRAS.
ESA's SMOS Project Manager Achim Hahne comments: *"After a long idle period, we now see light at the end of the tunnel and can start at last tart to do the final planning and preparations for the launch campaign."*

From information data coming from ESA News dated 27 April 2009 'September launch for ESA's water mission' and from the ESA Bulletin 137, February 2009.

SECOND FIRING TEST FOR VEGA'S ZEFIRO 9A SOLID ROCKET MOTOR

On 28 April 2009, the final qualification test firing of the third stage solid propellant motor of VEGA took place at the Salto di Quirra Interforce Test Range in Sardinia, Italy. It was a success.

THE OBJECTIVE OF THE TEST

The main objectives of the test were to verify the behavior of the Zefiro 9A motor in a fully flight-representative configuration, to confirm the design performance and to collect information for system studies at stage level.
The Zefiro 9A motor, 3.17 metres long with a diameter of 1.92 metre, is loaded with 10 tonnes of solid propellant and forms the third stage of the Vega launcher.
As soon as the test was over, the preliminary results for ballistic performance – pressure and thrust curves – and the thrust vector control behavior: this first analysis confirmed the overall success of the test.
After the first qualification test completed in October 2008, the firing of 28 April 2009 was the final step in the complete qualification test programme for the Zefiro 9A. This test also completes the overall ground qualification test campaign for all three Vega solid rocket motors.

ABOUT VEGA

Vega is a single-body launcher composed of three slid-propellant stages and a liquid-propellant upper module. It is approximately 30 metres high and weighs 137 tonnes at lift-off. The benchmark for Vega's in-orbit launch capacity is 1500 kg into a 700 km-altitude polar orbit used for many scientific and Earth observation missions. Together with the mid-class Soyuz launcher, Vega will ensure that a full range of launch services will be available for Europe, theby allowing optimised mission planning based on the exact performance required in each case for the lowest cost.

Figure 1. : On 28 April 2009, the final qualification test firing of the third stage solid propellant motor of VEGA took place at the Salto di Quirra Interforce Test Range in Sardinia, Italy. (Credit ESA)

From information data coming from ESA News dated 30 April 2009.

A GLIMPSE OF FUTURE GMES SENTINEL-1 RADAR IMAGES

A newly initiated campaign marks an important step in preparing for how data from the Sentinel-1 European Radar Observatory will be used for applications such as land-cover mapping and crop management. This campaign is called 'AgriSAR'.

WHAT IS SENTINEL-1?

Sentinel-1 is the first of five missions that ESA is developing for the GMES initiative dedicated to providing Earth observation data for the Global Monitoring for Environment and Security. It is due to launch at the end of 2011.GMES is a joint venture between the European Commission and ESA to fulfill the growing need for accurate and timely information to better manage the environment, understand and mitigate the effects of climate change and ensure civil security.

Figure 1. Radarsat-2 image of Flevoland, The Netherlands. (Credit MDA Geospatial Services)

THE OBJECTIVE OF AgriSAR

The objective of the current campaign is to evaluate how frequent multi-polarisation acquisitions provided by Sentinel-1 will improve its future applications, land-cover mapping and crop monitoring in particular. To accomplish this task, ESA has asked MDA Geospatial Services to acquire multi-temporal, quad-polarisation Radarsat-2 imagery throughout the 2009 growing season over three test sites:

– Flevoland in the Netherlands;
– Barrax in Spain;
– Indian Head in mid-West Canada.

MDA Geospatial services will simulate various imaging modes for the Sentinel satellites from the series of images acquired during the campaign. The campaign includes, for the first time, very frequent spaceborne radar images over the above mentioned test sites.

Figure 2. Radarsat-2 image of Barrax, Spain. (Credit MDA Geospatial services)

In addition to the contribution from MDA Geospatial Services, the AgriSAR campaign is also expected to include a number of European and Canadian scientists who will be invited to help with ground activities. The latter include the collection and analysis of information about land-cover, crop type, crop condition and other parameters such as soil moisture. Of particular interest are the new algorithms and methods required to extract land-cover information from a dense temporal series of Synthetic Aperture Radar (SAR) images and follow how the crops develop. The campaign provides a unique opportunity to thoroughly investigate the agricultural products that can be derived from multi-polarisation radar data as well as the methods and systems to generate these in an operational fashion.

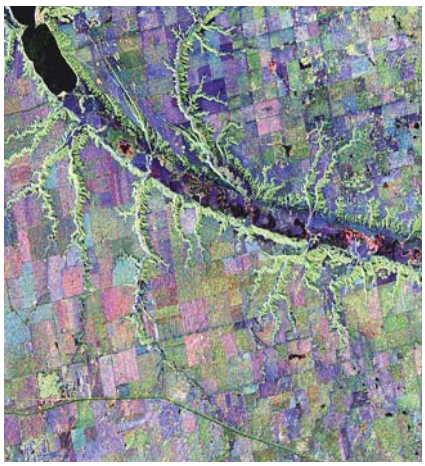


Figure 3. Radarsat-2 image of Indian Head, Mid-West Canada. (Credit MDA Geospatial)

The campaign is also expected to help scientists investigate future developments in remote sensing with radar.

The quad-polarisation imagery will allow researchers to investigate new types of products, for example high-resolution soil moisture maps and crop biomass. It will also help determine the added value of fully-polarimetric radar data for land applications.

FROM INFORMATION DATA COMING FROM ESA
NEWS DATED 23 APRIL 2009.

FRAGILE WILKINS ICE SHELF DESTABILISED

Satellite TerraSAR-X images transmitted on 24 April 2009 show that icebergs have begun to calve from the northern front of the Wilkins Ice Shelf – indicating that the huge shelf has become unstable. This follows the collapse on 5 April of the ice bridge that had previously linked the Antarctic mainland to Charcot Island.

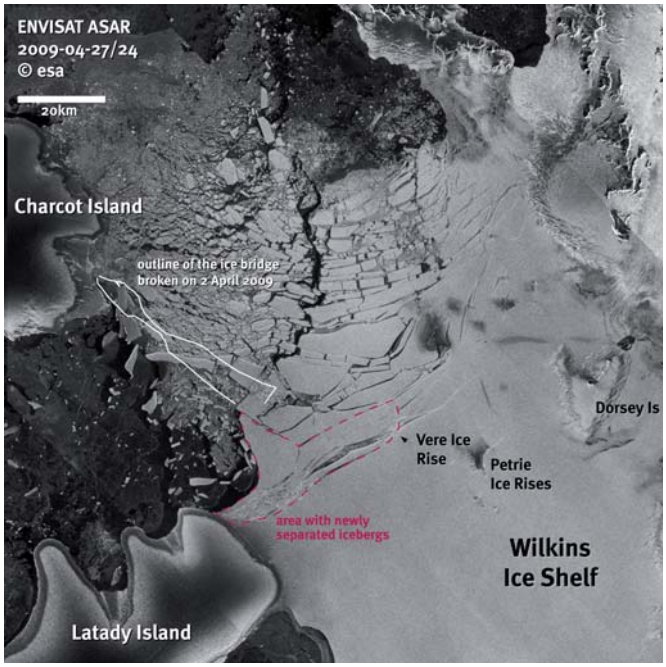


Figure 1. Superimposed Envisat images show margins of the collapsed ice bridge. (Credit ESA)

THE ICE BRIDGE

The Ice Bridge, which effectively formed a barrier pinning back the northern ice front of the central Wilkins Ice Shelf, collapsed on 5 April removing about 330 square-kilometres of ice ***(figure 1)***. As a consequence of that, the rifts, which had already featured along the northern ice front, widened and new cracks formed as the ice adjusted in the days that followed. Dr Angelika Humbert, Institute of Geophysics of Münster University, and Dr **Matthias Braun**, Centre for remote sensing, University of Bonn, have been monitoring the ice shelf using a combination of radar images from ESA's Envisat satellite and the German Aerospace Centre's TerraSAR-X satellite ***(figure 1)***.

On 24 April, the satellite data showed that the first icebergs had started to break away from the fragile ice shelf. A very rough estimate suggests that, so far, about 700 square-kilometres of ice have been lost from the Wilkins Ice Shelf.

In contrast to the ice bridge, which shattered very quickly ***(figure 2)***, it is expected that the discharge of ice will continue for some weeks. The icebergs are calving as a result of fracture zones that have formed over the last 15 years and which turned Wilkins into a fragile and vulnerable ice shelf. The combination of high resolution TerraSAR-X images and the more frequently acquired Envisat images increases the understanding of the ice shelf break-up more than ever before.

According to David Vaughan, British Antarctic Survey, "The retreat of Wilkins Ice Shelf is the latest and the largest of its kind .Eight separate ice shelves along the Antarctic Peninsula have shown signs of retreat over the last decades. There is little doubt that these changes are the result of atmospheric warming on the Antarctic Peninsula, which has been the most rapid in the Southern Hemisphere"[...] The changes to Wilkins Ice Shelf provide a fabulous natural laboratory that will allow us to understand how ice shelves respond to climate change and what the future will hold for the rest of Antarctica.[...] The quality and frequency of images acquired by satellites mean that the break-up of Wilkins Ice Shelf can be analysed far more effectively than any previous event. For the first time, I think, we can really begin to see processes that have brought about the demise of the ice shelf."

However, it is still unclear how the situation will evolve. According to Dr Humbert, "We are not sure if a new stable ice front will now form between Latady Island, Petrie Ice Rises and Dorsey Island. If the connection to Latady Island is lost, the projected loss of 3370 square-kilometres of ice might be greater – though we have no indication that this will happen in the near future."

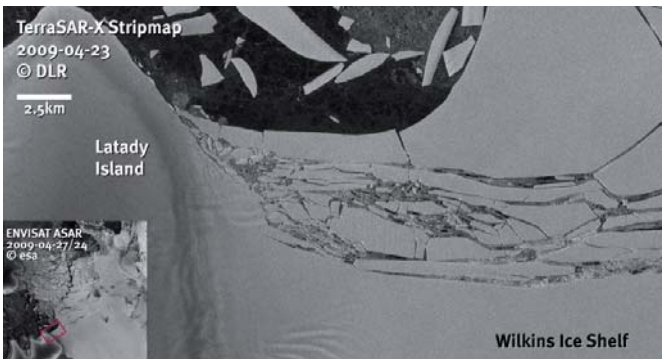


Figure 2. TerraSAR-X image over Wilkins from 23 April 2009. (Credit ESA)

From information data provided by ESA –
ESA News, 28 April 2009.

ESA PREPARES FOR THE NEXT GENERATION OF HUMAN SPACEFLIGHT AND EXPLORATION BY RECRUITING A NEW CLASS OF EUROPEAN ASTRONAUTS

The new astronauts were presented at ESA Headquarters on 20 May 2009

The new astronauts are:
– **Samantha Cristoforetti**, Italian
– **Alexander Gerst**, German
– **Andreas Mogensen**, Danish
– **Luca Parminato**, Italian
– **Timothy Peake**, British
– **Thomas Pesquet**, French

A SEVERE SELECTION

These new astronauts were selected following a Europe-wide recruitment process that started in 2008. Following thorough psychological, medical and professional screening that started with 8413 valid applications, they are the first new recruits to join the European Astronaut Corps since 1992.

WHY SIX?

This number was chosen taking into account flight opportunities planned not only under ESA programmes and activities but also the flights planned in the frame of a Memorandum of Understanding between the Italian Space Agency (ASI) and NASA. This was done in agreement with the Italian authorities and in accordance with the ESA Council decision taken in 2002 to create a single corps of astronauts in Europe.
In 2008, with the launch of the Columbus laboratory and of the Automated Transfer Vehicle (ATV) named Jules Verne, ESA became a full – fledged member of the International Space Station ISS) partnership, entering now a new phase of its utilisation. New young talents were needed to successfully perform the numerous scientific experiments on board of the ISS, the lifetime of which is being considered for an extension to 2020. They will therefore play quite a major role in the obtaining of the scientific return expected from the European experiments.

BEYOND THE ISS

After the ISS, it can reasonably be envisaged that our young new astronauts have the opportunity to participate in the future international exploration of the Moon (installation of a permanent base) and beyond. It is what Simonetta Di Pippo, ESA Director of Human Spaceflight, said on the occasion of the press conference on 20 May: "These young men and women are the next generation of European space explorers. They have a fantastic career ahead, which will put them right on top of one of the ultimate challenges of our time: going back to the Moon and beyond as part of the global exploration effort."

THE UPCOMING TRAINING

The new astronauts will start their basic training at the European Astronaut Centre (EAC) in Cologne, Germany. With ESA's ISS partners also having completed or currently finalising their own recruitment campaigns, they will also join a new class of international astronauts who will be prepared for future space missions to the ISS from 2013 onwards.

THE EAC

The European Astronaut Centre (EAC) was established in 1990, in the area of the DLR, the German Aerospace Center, in Köln-Porz. The EAC team is made up of more than 90 professionals, complemented by staff from the DLR, CNES (France) and from industry. Led by a former astronaut Michel Tognini, EAC has established itself as a centre of excellence for astronaut selection, training, medical support and surveillance, as well as support of astronauts and their families during preparation for and during flight. A large part of the work is dedicated to the preparation and implementation of astronaut training programmes for space missions to the ISS. For International Partner astronauts and for the ground operations personnel, EAC is the training centre for all European built ISS hardware, including ESA's Columbus laboratory systems/subsystems and payloads, as well as astronaut operations for the Automated Transfer Vehicle (ATV).

FROM INFORMATION DATA PROVIDED BY ESA PRESS RELEASE ESA PR 12-2009 AND ESA DOCUMENTATION ABOUT EAC.

The CEAS Member Societies

Association Aéronautique et Astronautique de France (3AF)

6,rue Galilée – F-75016 Paris
Tel.: + 33(0) 1 56 64 12 30
Fax: + 33(0) 1 56 64 12 31
3af@aaaf.asso.fr – www.aaaf.asso.fr

President: Michel Scheller
General Delegate: Jacques Sauvaget
jacques.sauvaget@aaaf.asso.fr
Secretary General: Robert Dubost
CEAS Council Member: Jean-Marc Garot
jean-marc.garot@igacem.gouv.fr
Executive Secretary : Anne Venables
secr.exec@aaaf.asso.fr
Event Coordinator: Lisa Gabaldi
lisa.gabaldi@aaaf.asso.fr
Secretary: Bouchra Ketfi
k.bouchra@club-internet.fr

Asociación de Ingenieros Aeronáuticos de España (AIAE)

Francisco Silvela 71, Entreplanta
ES-28028 Madrid
Tel.: + 34 91 745 30 30
Fax: + 34 91 411 30 02
ceas@coiae.com – www.coiae.com

President and CEAS Council Member:
Dr Antonio Martin-Carrillo Dominguez
carrillo@coiae.com
Vice-President and CEAS Council Member:
Dr Domingo Escudero López
escudero@coiae.com
Council Member AIAE & CEAS Director General: Pr Dr Leandro B. Fernandez Sáinz
l.fernandezs@recol.es
International Relations Manager:
Miriam López Álvarez
miriam@coiae.com

Associazione Italiana di Aeronautica e Astronautica (AIDAA)

Casella Postale 227 – I-00187 Roma V.R.
Tel / Fax : + 39 06 883 46 460
info@aidaa.it – www.aidaa.it

President: Prof.Amalia Ercoli Finzi
amalia.finzi@polimi.it
Secretary General: Prof.Antonio Castellani
a.castellani@aidaa.it
CEAS Council Member:
Prof. Franco Persiani – Università di Bologna
via Fontanelle 40 – I - 47100 Flori
franco.persiani@unibo.it
Secretary: Daniela Vinazza
daniela@aidaa.it

Deutsche Gesellschaft für Luft-und Raumfahrt Lilienthal-Oberth e.V. (DGLR)

Haus der Luft und Raumfahrt
Godesberger Allee 70
D- 53175 Bonn
Tel.: + 49 228 30 80 50
Fax: + 49 228 30 80 524
geschaeftsstelle@dglr.de – www.dglr.de

President: Prof.Dr-Ing.Joachim Szodruch
joachim.szodruch@dlr.de
CEAS Trustees: Prof.Dr-Ing.Joachim Szodruch and Peter Brandt
Secretary General: Peter Brandt
peter.brandt@dglr.de
Secretary: Astrid Lehmberg
astrid.lehmberg@dglr.de

Finnish Society of Aeronautical Engineers (FSAE)

c/o Airline Management Technologies
Leinikkitie 20 B – FI-01 350 Vantaa

President: Markku Roschier
markku.roschier@almt.fi
Tel.:+358(0)40 7029 375
Fax:+358(0)9 292 1440

Flygtekniska föreningen (FTF) – Swedish Society for Aeronautics and Astronautics

Anna Rathsman – c/o Rymdbolaget – Box 4207
SE-171 04 Solna – Tel: +46-8-627 62 62
Fax: +46-8-98 70 69 – anna.rathsman@ssc.se

President: Captain Roland Karlsson
Drottninggatan 18, SE – 602 24 Norrköping,
Tel.: + 46(0)11 345 25 16
Mob.:+ 46 (0)705 38 58 06
karlsson_roland@yahoo.se

CEAS Council Trustees: – Kaj Lundahl
Wiboms väg 9 • SE - 171 60 Solna
kaj.lundahl@telia.com
+46 8 270 264 – +46 703 154 969 (mob)
– Prof. Petter Krus : Linköping University
SE - 58183 Linköping – petter.krus@liu.se
+46 13 282 792 – +46 708 282 792 (mob)
Secretary: Bengt Moberg
Norrbackagatan 22,2tr
SE-113 41 Stockholm
Tel.: +46 709 97 90 60 – bengt.moberg@sas.se

Hellenic Aeronautical Engineers Society (HAES)

3, Karitsi Str. 10561
GR-10561 Athens
Phone.& Fax (HAES): +30-210-3239158
Working hours Phone:+30 22620-52334
Mob.:+30 697 997 7209
E-mail (HAES): admin@haes.gr

President: Dott.Triantafillos Tsitinidis
E-mail (pers.): ttsitinidis@haicorp.com

Nederlandse Vereniging voor Luchtvaarttechniek (NVvL)

c/o National Aerospace Laboratory
Anthony Fokkerweg 2
NL- 1059 CM Amsterdam
Tel.: +31 2O 511 3651 (secretariat)
Fax: +31 20 511 3210
nvvl@nlr.nl – www. nvvl.org

President and CEAS Trustee:
Jacob Hoekstra – j.m.hoekstra@tudelft.nl
Secretary General and CEAS Trustee:
Christophe Hermans
Tel.:+31 20 511 3298 – hermans@nlr.nl
Secretary: Astrid Bredt – asbr@nlr.nl

Royal Aeronautical Society(RAeS)

No.4 Hamilton Place – London – W1 J 7 BQ
United Kingdom – Tel.:+ 44(0)20 76 70 4300
raes@aerosociety.com – www.aerosociety.com

President 2008-2009: Captain David Rowland
Past-President and CEAS Representative:
David Marshall – marshall.daa@wanadoo.fr
President-Elect: Dr Michael F. Steeden
mfsteeden@dstl.gov.uk
Chief Executive: Keith Mans
Tel.:+44(0)20 7670 4302
keith.mans@aerosociety.com

PA to the Chief Executive: Anne Tompkins
anne.tompkins@aerosociety.com
Deputy Chief Executive & CEAS Council Member: Paul Bailey
paul.bailey@aerosociety.com
Conf.&Events Manager: Lorraine Reese
lorraine.reese@aerosociety.com
Secretary: Doreen Warner
doreen.warner@aerosociety.com

Schweizerische Vereinigung für Flugwissenschaften Swiss Association of Aeronautical Sciences (SVFW)

RUAG Aerospace/Engineering&Technology
Seetalstrasse 175 – PO Box 301
CH-6032 Emmen
Tel.:+41 41 268 4049 – Fax: +41 41 268 3937
www.svfw.ch

President: Dr Jürg Wildi
Executive Vice-President, RUAG Aerospace Engineering&Technology
Same coordinates as above
juerg.wildi@ruag.com
CEAS Council Member
Dr Geoges Bridel
c/o EADS Defence&Security
D-81663 Munich – Tel.:+49(0)89 607 270 81
Mob.:+49(0)171 791 5960
Fax:+49(0)89 607 290 44
Georges.bridel@eads.com
Priv.:georgesbridel@aol.com

Central Aerohydrodynamic Institute Russian Aerospace Society (TSAGI)

1 Zhukovsky St.,
Zhukovsky, Moskow Reg.,
140 180, Russia
+7495 556-4250
SLC@tsagi.ru
www.tsagi.com

The Council of European Aerospace Societies - CEAS -

The CEAS:an International Non-Profit Association
Located: Belgium - Rue du trône 98 - 1050 Brussels
www.ceas.org
The CEAS aims to develop a framework within which the major aerospace societies in Europe can work more closely together. The Member Societies: AAAF (France), AIAE (Spain), AIDAA (Italy), DGLR (Germany), FSAE (Finland), FTF (Sweden), HAES (Greece), NVvL (Netherlands), RAeS (United Kingdom), SVFW (Switzerland),TsAGI (Russia). Following its establishment as a legal entity conferred under Belgium Law,this new organisation began its operations on 1st January 2007.
The basic mission of the Association 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,industry,governments and academia. The Council is governed by a Board of Trustees,with representatives of each of the Member Societies.

The Officers of the Board for the year 2009 are:

- President: Prof. Dr-Ing. Joachim Szodruch
  joachim.szodruch@dlr.de
- Vice-President, External Relations & Publications:
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- Vice-President,Awards & Membership:
  Kaj Lundahl – kaj.lundahl@telia.com
- Vice-President, Finance :
  Dr Antonio Martin-Carrillo Dominguez – carrillo@coiae.com
- Director General :
  Prof.Dr Leandro B. Fernández Sáinz – l.fernandezs@recol.es
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  The successor of Mr Alain Garcia will be appointed on 10 July.
- Chairman of the Space Branch :
  Dr Constantinos Stavrinidis – constantinos.stavrinidis@esa.int
- Editor-in-Chief,CEAS Quarterly Bulletin :
  Dr-Ing.Jean-Pierre Sanfourche – jpsanfourche@dbmail.com

Among the Main Coming Events 2009

- **3-4 June**: RAeS - The Edge of the Envelope: Technology Advances in Flight Simulation - Spring Flight Simulation Conference - London.
- **10-11 June**: RAeS - Support of Helicopter operations / Through Life Capability Management - Rotorcraft group Conference - London.
- **18-19 June**: 3AF-Dassault Aviation - HISAC 2009 High Speed Aircraft - Club Confair Conference Centre - 54, r. Laffitte, Paris 9ème www.hisac2009.com
- **23-24 June**: RAeS - The Handley Page Centenary: 100 years of Education in Aeronautics - Time for a change? - Annual Training Conference - London.
- **23-24 June**: CEAS - AIAA/CEAS International Forum on Aeroelasticity and Structural Dynamics (IFASD) 2009 - Seattle, USA. vrossi@azimuth-corp.com - www.ifasd2009.com
- **29 June-3 July**: AIDAA - 20th National congress of AIDAA - Milan. www.aidaa2009.org
- **30 June**: RAeS - Space Tourism, a new industry on the making - Space Group Conference - London.
- **1-2 July**: DGLR - Eucomas 2009 - Augsburg.
- **9 July**: RAeS - Human Factors in Design for Flight Safety - Human Factors Group Conference - London
- **8-10 September**: DGLR - German Aeronautics Congress (DRLK 2009) Aachen. www.dlrk2009.dglr.de
- **10 September**: RAeS - Handley Page Ltd - Celebrating the Centenary of the first British Aircraft Company - Historical Group Conference - London.
- **16 September**: RAeS - Applying Open Systems Architectures - Avionics & Systems Conference
- **22-25 September**: DGLR/CEAS - 35th European Rotorcraft Forum - Hamburg - www.erf2009.org
- **23-24 September**: RAeS - A Training & Regulatory Environment for Tomorrow - Annual International Flight Crew Training Conference - London.
- **28 September-2 October**: NVvL - International Council of the Aeronautical Sciences (ICAS)- PC Meeting and Workshop - nvvl@nlr.nl - www.icas.org
- **1-2 October**: 13th CEAS - ASC - Aeroacoustics Workshop & 4th Scientific Workshop of X-3 Noise -"Resolving uncertainties in airframe noise testing and CAA code validation" - Place of Parliament - Bucharest, Romania
- **14-16 October**: DGLR - IMAPP Conference - Hamburg.
- **26-29 October**: Manchester (UK), 2nd CEAS European Air & Space Conference 2009. Please consult regularly the Website www.ceas2009.org in order to keep exactly informed of the evolution of the preparation process..
- **6 November**: RAeS - Aerospace & Aviation Careers Fair
- **18-19 November**: RAeS - Fixed -wing and Rotary-wing FSTDs - The way ahead - Automn Flight Simulation Conference - London.
- **24 November**: RAeS - Design Methods and Tools for Light Aircraft - General Aviation Conference
- **25 November**: RAeS - Structures & Materials - Half Day Seminar
- **3-4 December**: 3AF- Space for Defence and Security in Europe International Conference- Paris - lisa.gabaldi@aaaf.asso.fr

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- **3-5 February**: 3AF - Optronics - International Conference - lisa.gabaldi@aaaf.asso.fr
- **9-19 February**: FTF - MODPROD International Workshop on Model Based Product Devel opment - Linköping University, Sweden

Editorial Board