

## Editorial

### MANCHESTER: OBJECTIVE 1000!

The CEAS 2009 European Air & Space Conference will be the major event in the European Aerospace Calendar next year. Hosted by the Royal Aeronautical Society, it will take place in Manchester from 26 to 29 October 2009, bringing together aerospace professionals, companies and organisations not only from across the European Union but also from major global aerospace nations.

During the last months, the organising committee has considerably advanced its preparation but, as everyone is aware, the global financial circumstances have been changing dramatically. After having re-examined the detail of both current plans and budget for the RAeS and the CEAS in 2009, and carefully assessed the risks incurred, the decision has been taken to proceed with this very important and exciting event.

To ensure the conference's financial success, we need the conjunction of a high delegate income and significant support from industry and institutions. The CEAS Member Societies are therefore asked to, on the one hand, commit to promoting within their communities the highest possible level of delegate participation, and on the other hand, deliver sponsorship commitment from industry and other relevant organisations.

But to get the best response from delegates and sponsors the quality of our Conference must be excellent, which requires attractive technical presentations and debates. This is the reason why we must receive (by mid-January) as many abstracts as possible of proposed high-level presentations in response to the CEAS 2009 Call for Papers (see Annex and [www.ceas2009.org](http://www.ceas2009.org)).

1000 attendees and some 450 outstanding papers are the two key figures of our ambition. There is no doubt that they are attainable and the efforts needed should not be seen as a burden, but rather insurance in making CEAS 2009 extremely useful to the European Aerospace profession and the big success we know it can be.



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



Jean-Pierre Sanfourche  
Editor-in-Chief  
of the CEAS Bulletin

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## THE MANCHESTER CONFERENCE PREPARATION IS BEING ACTIVELY PERSUED • 26-29 October 2009 •

- Sponsorship 'campaign' initiated:
- Membership of Organising Committee, Technical Programme Board, Regional Advisory Group being finalised.
- [www.CEAS2009.org](http://www.CEAS2009.org)
- Articles for CEAS Bulletin and Aerospace Professional submitted
- Briefing to CEAS Trustee Board 5 September 2008

- Initial PR (First Announcement flyer, date & venue in CEAS Quarterly Bulletin, promotion at Aerospace Testing Conference, Munich)
- 7<sup>th</sup> May 2008 Consortium bid into EC FP7 2<sup>nd</sup> Call.
- 13<sup>th</sup> May 2008 briefing to RAeS Specialist Group Committee
- 28<sup>th</sup> May 2008 CEAS 2007 Review in Berlin
- Liaison established with ICAS Secretariat under terms of CEAS/ICAS MOU
- Initial contact with NWSC Aerospace sub-group via NWDA, briefings provided
- Expressions of interest from NWAA, SBAC (ASD), IET, IMechE
- Contacts established at Manchester, Liverpool, Salford Universities

- [www.CEAS2009.org](http://www.CEAS2009.org) activated
- Consortium bid into EC FP7 2<sup>nd</sup> Call successful.
- Announcement and Call for Papers finalised, in print
- Front page editorial and article published in CEAS Quarterly Bulletin No. 3
- First bids for exhibition space received in response to CEAS Bulletin article
- Full page item in Aerospace Professional October 2008 issue
- Regional Advisory Group established, Chair appointed, first meeting in prospect
- RAeS Young Members' Board 'commissioned' to lead European Young Aerospace Professionals initiative

- Membership of Organising Committee, Technical Programme Board, Regional Advisory Group finalised.
- Abstract handling software down-select in progress
- Agreement to host 2-day FP6 NODESIM work-shop
  - Consortium includes Airbus, QinetiQ, Alenia Aeronautica, Dassault Aviation, Atkins, Inria, DLR, Man Turbo, CIMNE, Saturn, NUMECA International, Brussels, Delft and Trieste Universities, Sigma Technology, Onera, Esteco
- Proposal for EASA plenary plus 3 breakout strands covering Air Transport, Rotorcraft, GA (1 day total)
- Gala Dinner identified as venue for CEAS medal award ceremony.

- NODESIM workshop being planned
- RAeS Air Law Group proposal for 'mock trial'

- Contract negotiations on successful Consortium bid into EC FP7 2<sup>nd</sup> Call initiated
- Announcement and Call for Papers now in all RAeS Conference Packs
- Promotional item in RAeS Diary, Handbook
- Regional Advisory Group Chair meeting with Manchester City Council 17 November
- RAeS Project Officer appointment
- Abstract handling package options under consideration
- ICAS, EUCASS correspondence progressing

### Timetable of Events I

- September 2008:
  - Sponsor/ exhibitor campaigns
  - VVIP/keynote speaker list and invitations issued
  - Launch conference flyer, web-site
  - Issue Conference Announcement & Call for Papers
  - Organising Committee / Regional Advisory Group/ Technical Programme Board & Working Groups/ CEAS Consultative Group memberships finalised
- October-December 2008:
  - Committees/ Groups meet
  - Baseline programme design agreed
  - Abstract handling and registration systems launched/ validated

### CEAS 2009

#### Technical Programme proposals

- *In association with:*
  - RAeS Air travel – Greener by Design conference
  - RAeS Unmanned Air Systems conference
  - NODESIM consortium
- Launch of European Young Aerospace Professionals Forum
- ICAS 2008, CEAS Member Society 2009 annual conference and 2009 European Rotorcraft Forum papers eligible for submission
- Core Space & Space Propulsion, Aviation & Air Transport themes
- Systems, Materials & Structures, Safety, Airworthiness & Security, Training & Simulation, Human Factors, Performance & Training, Flight Operations themes
- Focus/ Panel sessions on EASA, R&T, Air Power, Infrastructure, Industry and supply chains, Aviation Medicine, Air Law (mock air safety related trial)

### Timetable of Events II

- 12 January 2009: Abstract submission deadline
- 27 February 2009: Notification to Authors
- 30 March 2009: Programme issued
- April 2009: Registration starts (in parallel with RAeS Conference)
- July 2009: Early-Bird registration deadline
- 17 August 2009: Deadline for submission of papers
- 26-29 October 2009: Conference



## The International Council of the Aeronautical Sciences – ICAS

*ICAS and CEAS have signed on 29 November 2007 a Memorandum of Understanding establishing a cooperation agreement about exchange of information and support. CEAS Member Societies are also ICAS Members.*

*ICAS has recently celebrated its 50<sup>th</sup> anniversary on the occasion of the Anchorage Congress, 14-19 September 2008.*

### Historical Background



*Theodore von Karman, one of the most outstanding figures in the history of aeronautics. Leader of aeronautical research, he was a promoter of international co-operation in this discipline. In 1956, at the age of 75, he was chairman of the AGARD.*

The first ICAS meeting was an informal discussion, over dinner but lasting five hours, on 29 January 1957 during the IAS – Institute of the Aeronautical Sciences – (today AIAA) Annual Meeting. At von Karman's suggestion, representatives of the aeronautical societies of eight other countries had been invited to join representatives of the IAS to consider the possibility of establishing such a congress. With **Theodore von Karman** in the chair, the meeting agreed on a set of principles which have remained the guiding ideals of ICAS ever since. It was agreed that the governing body of the organisation would be a Council, consisting of one representative of each participating country, which would meet at the time of congresses to be held at about two-year intervals. An Executive Committee was formed immediately from among those present, with **Maurice Roy**, Director of ONERA, as its first chairman. To keep up momentum, **von Karman** proposed that a follow-up meeting be held in Paris in May 1957. This was attended by representatives of ten countries, with **Maurice Roy** chairing. Those defined an outline constitution and set up an organisation to prepare the first congress: Madrid, September 1958.

Most of the basic principles set out in the first meetings have held good for the past 50 years, with the rules and structure evolving slowly without departing from the clear vision of the founding fathers: the distinguished American industrialist and philanthropist Harry Guggenheim and the famous Hungarian scientist **Theodore von Karman**.

### Today, in brief

ICAS is a non-government not-for-profit scientific organisation to encourage the free international exchange of information on aeronautical research and technology. It currently serves as the only international support organisation to representative aeronautical engineering professional societies and associated organisations and their members in over 30 countries. ICAS arranges an international congress every two years (even years) hosted by one of its member societies, with a view to providing aeronautical scientists and engineers from all over the world with a forum in which they could meet to learn about discoveries in aeronautical science, technology and products, exchange ideas and experiences and develop a friendly professional network free from cultural, political and ideological constraints.

The ICAS 2008 Congress was held in Anchorage, Alaska, USA, from 14 to 19 September, with the American Institute of Aeronautics Astronautics (AIAA) acting as the host Society. The 50<sup>th</sup> Anniversary of ICAS was celebrated by a general lecture "ICAS – THE FIRST 50 YEARS" presented by **Dr John E. Green** of UK, who was ICAS President, 1996-1998. In addition a special celebration medal was handed over to ICAS Member Societies and ICAS Associates. A history booklet "ICAS - The first 50 Years" edited by **F. J. Sterk** (NL) has been prepared and will soon be printed.

Furthermore ICAS organises, in connection with the meeting of its Programme Committee (odd years), a thematic workshop aiming at providing the opportunity to international experts in the field to exchange views and to identify further areas for potential cooperation. The theme for the 2007 Workshop was "**UAV-Airworthiness, certification and access to the airspace**". The 2009 workshop will be held in Amsterdam on 28 September with the theme "**Aviation and Environment**".

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E.Mail: [secrexec@icas.org](mailto:secrexec@icas.org)

### ICAS Awards

ICAS has established a number of awards listed below - the first three are connected with an award lecture presented at the congress:

- **ICAS - Daniel and Florence Guggenheim Memorial Lecture** in the Aeronautical Sciences in recognition of the initiative and the great support received from the "Daniel and Florence Guggenheim Memorial Fund for the Promotion of International Co-operation in the Aeronautical Sciences" when ICAS was founded. **Recipient 2008: Prof. Earl H. Dowell from Duke University, USA.**
- **ICAS – von Karman Award for International Cooperation** in Aeronautics founded in 1980 in memory of Theodore von

Karman, who was the leading figure in the foundation of ICAS. Its purpose is to acknowledge exceptional achievement in international cooperation in the field of aeronautics, being awarded to a project or programme in which two or more countries are major participants. **Recipient 2008: Boeing 787 Dreamliner Programme**

• **ICAS – Award for Innovation in Aeronautics** was established in 2006 to recognize contributions of an individual or a team in effectively integrating a suite of advanced technologies, combined with new design and/or manufacturing processes, to create a new aeronautical system with significant worldwide impact. **Recipient 2008: Prof. Alexander Starik from Central Institute for Aviation Motors, Russia.**

• **ICAS - Maurice Roy Medal** was established in 1986 in memory of Maurice Roy, who was one of the Founding Members, President and Honorary President of ICAS. Its purpose is to honour persons of distinction who have an exceptional record in fostering international cooperation between scientists by their personal participation and involvement in aeronautics. **Recipient 2008: Dr R. Curtis Graeber from The Boeing Company, USA.**

• **ICAS - John J. Green Award** was established in 2002 commemorating the third ICAS President. Its purpose is to honour young persons under 40 who have demonstrated an exceptional record in fostering international cooperation in aeronautics. **Recipient 2008: Mr Hagen Helm from GE Aviation, UK.**

• **ICAS - Distinguished Service Award** was established in 2006 to honour an individual who has made a significant contribution or provided an exceptional service that helped to advance the vision and goals of ICAS. **Recipient 2008: Prof. Yasuhiko Aihara from Japan.**

• **ICAS - John McCarthy Student Awards** are given to the authors of the two best student papers presented at the Congress: **Recipients 2008: Mr Alan Sutherland from South Africa and Ms Susan Liscout-Hanke from France.**

## A Short Report on ICAS 2008

This Congress, the 26<sup>th</sup> one, was one of the most successful in the ICAS history. The number of registered participants exceeded 750, accompanying persons not included. The Call for Papers attracted over 650 submissions from around 40 countries. Furthermore the 8<sup>th</sup> AIAA Aviation, Technology, Integration and Operations (ATIO) Conference was fully integrated in the ICAS programme, adding about 120 papers. In total about 450 papers were presented orally in 11 parallel session tracks together with a good number of poster presentations. The final programme contained approximately 600 papers – oral, standby and posters –.

The Congress organised more sessions than usual on Air Traffic Management and Operations due to the integration of the ATIO Conference. A number of very high-quality invited and Award lectures, listed below, were also presented.

– **ICAS DANIEL & FLORENCE GUGGENHEIM MEMORIAL LECTURE:** Prof. **E. Dowell**, Duke Univ., USA. Nonlinear Aero-elasticity of Current and Future Aerospace Vehicles.

– Prof. **I. Waitz**, MIT, USA. Environmental Impact of Aviation: a review of selected US research efforts.

– Prof. **D. Lee**, Manchester Metropolitan Univ., UK. Aviation Climate Impact – A summary of ongoing European research programmes.

– Dr **J. Green**, UK. ICAS – The first 50 years.

– Mr **A. Rauen**, CEO Eurofighter GmbH, Germany. Eurofighter/Typhoon Programme.

– **ICAS JOHN SWIHART LECTURE FOR INNOVATION IN AERONAUTICS:** Prof. **A. Starik**, CIAM, Russia. Innovations in combustion technology for propulsion.

– Dr **N. Takeda**, Tokyo Univ., Japan. Recent development of structural health monitoring technologies for aircraft composite structures.

– **ICAS von KARMAN LECTURE:** Mr **M. D. Jenks**, VP Boeing Commercial Airplanes, The Boeing Company, USA. The Boeing 787 Dreamliner Programme.

The ICAS 2008 Proceedings on CD Rom containing 512 full papers can be purchased (120 Euros incl. postage) from [secr.exec@icas.org](mailto:secr.exec@icas.org). The General Lectures are available on [www.icas.org](http://www.icas.org)

## The new ICAS President

At Anchorage, **Professor Ian Poll** (UK) was elected ICAS President for the next two years. Ian Poll is Professor of Aerospace Engineering at Cranfield University and Technical Director of Cranfield Aerospace Ltd. He is a Past President of the Royal Aeronautical Society.



*Professor Ian Poll*

## Next ICAS Congresses

– The ICAS 2010 Congress will be held in Nice, France, 19-24 September 2010, hosted by *the Association Aéronautique et Astronautique de France*. Call for papers will be published in February 2009. More information will be available on [www.icas.org](http://www.icas.org) and on [www.icas2010.com](http://www.icas2010.com)

– The ICAS 2012 congress will be held in Brisbane, Australia, 23-28 September 2012.

BY ANDERS GUSTAFSSON  
ICAS Executive Secretary

## ILA 2008 Berlin Air Show: New Records Set

*Organised jointly by the German Aerospace Industries Association (BDLI) and by Messe Berlin GmbH, the ILA 2008 Air Show took place from 27 May to 1st June 2008 on the Southern section of Berlin- Schönefeld Airport, which has been designated as the Berlin Brandenburg International Airport (BBI) As an international aerospace marketplace, as a gateway to Central and Eastern Europe and as a forum for innovation, business development and aerospace policies, it soared to new heights.*

### The Opening

Against the impressive background of an Airbus A380, Federal Chancellor Dr Angela Merkel officially opened ILA 2008 on Tuesday afternoon 27 May saying: «The ILA is a shop window for the aviation and space industries». She extended a particular welcome to India, ILA this year’s partner country. She also mentioned that the decision to start her opening tour of the ILA by visiting the exhibition devoted to the “60th Anniversary of the Berlin Airlift” was an intentional one, in view of the fact that this historic event was an “outstanding symbol of transatlantic collaboration”.

### Some figures

ILA 2008 provided an impressive display of the aerospace sector and was also a major attraction to the public. The attendance of 241,000 nearly reached the record level set at ILA 2006 (250,000) and approximately 120,000 trade visitors (2006: 115,000) came to find out about the products and services on offer on the 250,000 square metre site, Germany’s largest temporary exhibition grounds, and to learn about the latest trends at more 100 accompanying conferences. Contracts and business with a value of more than 5 billion Euros were finalized during the event, including the largest known order ever for civil aircraft at the ILA, which was placed with Airbus by Gulf Air (Bahrain) for 35 aircraft worth 3.2 billion Euros. The partner country India made the most of its largest ever appearance at any aerospace show outside its own borders by presenting its wide-ranging capabilities and sounding out business opportunities. For six days the record total of 1,127 exhibitors from 37 countries presented products, systems and processes from every area of the aerospace industry. Altogether 331 aircraft of all sizes and categories were on show on the ground and in the air, and many of them were making their first public appearance. Among the aircraft: Airbus A380, Antonov An-124, Lockheed C-5, and some 80 helicopters. International Suppliers’ Centre (ISC) provided the supply industry with its own platform. At the Career Centre the



1. ILA 2008. Aerial photograph.

emphasis was on career opportunities and prospects. Some 4,300 media representatives from 70 countries provided comprehensive coverage of the main technical themes and the attractions for the public at ILA 2008.

### India

After Russia in 2006, India was the official partner country at ILA 2008. In reply to an invitation by the Federal Minister of Defence, Dr Franz Josef Jung, India presented itself with more than 25 leading aerospace organisations, companies and numerous political, military and industrial delegations. India’s Minister of Defence, Arakkaparambil Kurian Antony, underlined the great importance which his government attaches to strengthening international cooperation in aerospace and defence.

### Berlin Airlift Anniversary

The 60<sup>th</sup> anniversary of the start of the Berlin Airlift was celebrated at ILA 2008. Many guests of honour were present and among them, the famous “Candy Bomber” Gail S. Halvorsen. Let’s recall that the Berlin Airlift, which was a mission unique in airmanship and logistics, marked the beginning of German-American friendship after World War



2. ILA 2008. The EADS Pavilion.



3. ILA 2008. Passenger & Transport Aircraft. The DLR Airbus A320-232 ATRA contains a Fuel Cell System from Michelin. This is a common project of Airbus and the DLR.

II and turned out to be significant for the freedom and history of Europe.

### Path of Innovation

One of the main themes of ILA 2008 was that of innovations that are responsible for significant reductions in the emission of pollutants by aircraft. For example, the “Greener Skies Ahead” conference featured international experts and leading figures from aircraft manufacturers and well-known research establishments. Supported by BDLI, Aviation Week, DGLR, BBAA and Messe Berlin, the Berlin air Show established a high-level forum for the international exchange of knowledge, views and information about the latest developments in technology and rule making. Dr Jean Botti, Chief Technical Officer of EADS, Prof. Dr- Ing. Joachim Szodruch, Member of DLR’s Executive Board Chairman DGLR, were among the top-speakers as well as Dr Norbert Arndt, Managing Director Engineering Rolls-Royce Germany, Dr Alan Epstein, VP Technology & Environment Pratt & Whitney, Dr Thomas Scherer, VP Environmental Control and Systems Engineering Airbus, and Michael Friend, Global technology Boeing. The discussions dealt with the required technology, most of which is sufficiently developed for use, as was demonstrated by the products and projects from the 24 exhibitors at the ILA **“Path of Innovation”**. The latter took trade visitors directly to those stands and exhibits where innovative and environmental-friendly technologies and products were presented, including the fuel-cell demonstrator unit onboard an Airbus A320 and Boeing’s Diamond fuel cell research plane.

According to Dr Thomas Enders, Airbus CEO and President of the German Industries association – BDLI – ILA 2008 has given impetus to growth and innovation and was the most important industry event on the European Continent in 2008.



4. ILA 2008. Special Aircraft and Technology Demonstrator-VFW- 614 ATTAS, German Aerospace Centre.

### ILA Structure

As industry continues to diversify ILA Berlin Air Show is structured in trade show segments that are in line with the market. Key segments are: Air transport – Spaceflight – Defence and Security – Equipment and General Aviation , including Corporate Aviation and Helicopters.

### Space Pavilion

Featuring a joint Space Pavilion sponsored by ESA, DLR, the Federal Minister of Economy and BDLI, the ILA Space World with industrial exhibits and the ILA Space Day, the Berlin Air Show once again confirmed its role of leading European space trade show. A study conducted by German industry, ATV-Evolution, dealing with a European manned space project, was demonstrated for the first time in public.

### International Suppliers Centre

Jointly opened by Peter Hintze, the German government’s Aerospace Coordinator, and Dietmar Schrick, BDLI’s Managing Director, the International Suppliers Centre – ISC – exceeded all expectations. Highly satisfied exhibitors and lots of industrial and trade activities were reported from the three-day “show within a show”, exclusively dedicated to secondary suppliers and well-attended by groups of purchasing offices and experts, especially those from OEMs exhibiting at the ILA. At the daily ISC Forum future process chains and scenarios were being discussed in direct dialogue with industrial leaders and experts. As a leading supply chain and procurement platform for global partner networks, US-based Exostar was among the exhibitors making successful use of the ISC. As the ISC was completely booked long before the opening of the trade show, the ILA organisers expect further growth in the future.



5. ILA 2008. Historic Aircraft. North American B-25J Mitchell. The flying Bulls.

### 100 International Conferences

With some 100 international aviation and aerospace conferences, ILA Berlin was able to further strengthen its leading position as a top-class international trade show and conference event. The conferences were listed by categories : Commercial Air Transport – Spaceflight – Defence and Security – Equipment, Engines – General Aviation – Education and Career – R&D – Helicopters – Maintenance,

Technical services – Politics and Economy –. The conference programme was highlighted by an Airbus Ministerial Meeting , ILA’s 4<sup>th</sup> International Parliamentarians’ Day, a Conference on India’s Defence Capabilities, Procurement and Offset Policies and the European Conference on Materials and Structures in Aerospace – EUCOMAS – . In total about 7,700 attendees registered for the conferences.

### ILA 2008 was highly appreciated

According to a survey, exhibitors and trade visitors were highly satisfied with the commercial results of their ILA attendance with a favourable overall impression reported by more than 92% of the participants. ILA 2008 gave strong economic impetus to the regional around the capital, satisfied visitors recommend visiting the ILA, the ILA experience delighted the general public.

### ILA 2010

The next ILA will take place from 8 to 13 June 2010 on the Southern section of Berlin-Schönefeld Airport. For further information, please visit [www.ila-berlin.com](http://www.ila-berlin.com)

R. DOERPINGHAUS  
 J.-P. SANFOURCHE



6. ILA 2008. ILA History. Exhibition Hall, 1928.





## Interview with Patrick Goudou, Executive Director of the European Aviation Safety Agency (EASA)

by Jean-Pierre Sanfourche, Editor-in- Chief of the CEAS Bulletin



*Patrick Goudou,  
Executive Director of  
the EASA.*

***Since its creation in 2003, could you in a few words recall the major objectives the EASA has successfully reached, and also the main difficulties it had to overcome?***

The main challenge at the start for the Agency was the fact that it was a completely new organisation which had to establish itself in the European aviation safety system as well as internationally. Having said that, I must note that the creation of the Agency was supported not only by the European Union institutions but also by the European aerospace industry itself, who had been demanding for years a common authority in Europe to stop the increasing fragmentation among different authorities in the Member States. Industry was also keen to see a European counterpart to the US Federal Aviation Administration (FAA) on the international scene. After five years of operations, the Agency has grown today into an organisation known and respected as a leading safety regulator and reliable partner for civil aviation authorities and organisations worldwide. It is today a centre of excellence in European aviation, employing some 500 professionals from all over Europe. We issue some 7,000 approvals and certificates every year, valid in 31 countries (the 27 Member States of the EU, as well as in Iceland, Norway, Switzerland and Liechtenstein). Some prominent examples of these were the certification of the Airbus A380, the Falcon 7X, the Rolls Royce Trent 900 and 1000 engines, among others. We draft some 20 new rulemaking proposals every



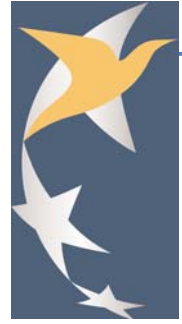
year and oversee the implementation of European legislation through roughly 40 inspections in the Member States annually. The Agency's success was further confirmed by the new, extended responsibilities that were entrusted to it by the EU this year.

***What are the new responsibilities the EASA has been given in the course of 2008?***

A new EU Regulation, our "Basic Regulation", which entered into force on 8 April 2008, gives to the Agency new responsibilities in the areas of air operations, flight crew licensing and the authorisation of third-country (non-EU) operators. The provisions of this Regulation will be detailed in Implementing Rules which have to undergo public consultation before being adopted by the EU. This is already the case for example for the NPAs (Notices of Proposed Amendment) on Flight Crew Licensing and Authority and Organisation Requirements, which are currently published for comments.

To give you some more details on the Agency's new tasks: in the area of Operations, the Agency is drafting the common rules for commercial air transport. Common safety standards will apply to airlines throughout the EU. The cabin crew will also have to comply with common requirements in terms of training and qualifications. In addition, the Agency will regulate operational issues for non-commercial operations. In the area of Flight Crew Licensing, the Agency will draft common rules for the issuing of private and professional pilot licences, and the associated ratings. We will also approve and oversee training organisations and simulators located outside the territory of the EU.

At this point I would like to clarify that the actual oversight of operators and the issuing of individual licences will be per-



formed by the National Aviation Authorities, as it happens today. However in performing these tasks, they will have to follow the new common rules.

The third new area of responsibility is the authorisation of third country operators. This advance approval, before they enter European airspace, is the convincing solution to implementing common safety standards, which will complement the existing EU “black-list”.

As in the past, transparency and cooperation are our two basic principles for this consultation phase. We want all stakeholders to be actively involved in the rulemaking process. It is also the Agency’s objective to ensure that implementation is as seamless as possible. Transition phases will give stakeholders the time to adapt to the new framework. These however cannot go beyond 2012, as specified by the EU Regulation. In addition, the Agency will issue detailed documentation and explanatory material to help the day-to-day activities and facilitate the transition.

***An EU-US Safety Agreement has been signed recently: do you consider it as a key step forward? In particular, will it facilitate the relationship with the FAA?***

This bilateral agreement, signed between the European Community and the United States, is indeed an important step forward in the Agency’s international relations. It acknowledges its role as a reliable partner for its counterparts worldwide and will serve to reinforce the very good relationship we already have with the FAA. An important aspect of the agreement is that it enables the reciprocal acceptance of certificates issued by EASA and the FAA. Its scope covers the airworthiness approvals and monitoring of civil aeronautical products; environmental testing and approvals; and the approvals and monitoring of maintenance facilities. It also aims at ensuring the continuation of high-level regulatory cooperation and promoting a high degree of safety in air transport. Thanks to the reciprocal acceptance of certificates, the agreement will result in better harmonised safety systems on both sides of the Atlantic, as well as less cumbersome technical and administrative procedures for the recognition of certificates. This will reduce costs and pave the way for a level-playing field for European and US manufacturers.

***Is the EASA playing a role in the aviation environmental requirements determination process?***

Yes. One of the main functions of the Agency is to support the European Commission in the drafting of rules and regulations, including those related to environmental protection. We do this through the EASA Rulemaking process, which aims to achieve a fully transparent and independent process. A good example is an NPA we issued earlier this year, NPA 2008-15 on Essential Requirements for Civil Aviation Environmental Protection. This NPA, which proposes improvements in environmental protection in the regulation of

European civil aviation, underlines the Agency’s commitment to the goal of environmental protection. Existing international standards do not cover all types of aircraft and it takes a long time to introduce modifications. This makes it difficult for Europe to respond quickly to new developments. An alternative approach is for the Community to adopt its own environmental objectives. While ensuring compliance with international standards, this would enable Europe to better pursue environmental priorities. Although the EASA regulatory system is expected to cover all aspects of civil aviation safety in the near future, in the domain of the environment, the Agency’s role is limited essentially to ensure the environmental compatibility of aircraft and engines according to requirements of the International Civil Aviation Organisation (ICAO). Taking into account that all aspects of aviation have an environmental dimension, this rulemaking proposal suggests a number of essential requirements, including for example measures to ensure aircraft are operated in an environmentally appropriate way.

***The first European Single Production Organisation Approval was given Airbus last July: what are the advantages of this new procedure in comparison to the previous one?***

While the Agency is responsible for the certification of production organisations located outside the EU, it can approve European organisations on request of EASA Member States. This was the case with Airbus. This “single” certificate replaces the previously existing national Production Organisation Approvals issued by the French, German, Spanish and UK National Aviation Authorities. The advantage is that the single POA mirrors Airbus’ trans-national organisation, reducing administrative procedures, while the single point of oversight ensures a uniform implementation of the rules. EASA now acts as executive agent for the oversight of Airbus aircraft and issues Export Certificates of Airworthiness for new Airbus aircraft delivered outside the EASA Member States. I must also note that the issuing of the certificate was the result of the National Aviation Authorities and EASA working hand in hand and supporting each other. The certification was the result of a thorough process which involved a comprehensive assessment of the organisation by a mixed team of EASA staff and experts from France, Germany, Spain and the United Kingdom. Also in future, EASA and the four NAAs will work closely together. Regular inspections will be carried out by the Agency and NAA experts in order to provide continuity for Airbus and its customers.

***The EASA is going to play a major role in the development of the Single European Sky(SES):(i) what are the main aspects of this new task?(ii)how the EASA will work in liaison with EUROCONTROL and SESAR?***

Safety is an integral part of the Single European Sky. This is why, as part of the 2nd package of the Single European Sky (SES II), the European Commission proposed last June the extension of EASA's competences in the areas of aerodromes, Air Navigation Services (ANS) and Air Traffic Management (ATM). These competences will make the Agency responsible for safety across the whole aviation system and will give to the Agency an important part in the development of the SES. Acting as a strong independent safety regulator, its role will be to ensure that any technical solution, concept, equipment, personnel or organisation involved in civil aviation works safely.

The Agency is already preparing to take up these new responsibilities. This will be done in cooperation with SESAR as the provider for European air traffic management infrastructure and EUROCONTROL as the ATM architect. EASA and EUROCONTROL have already two years of fruitful cooperation. We are now in the process of establishing proper interfaces with SESAR JU. These should not impose inappropriate or too strict rules to development. But they can anticipate solutions to regulatory issues which may emerge during the subsequent implementation phase. The Agency's issued Opinion on ATM/ANS already foresees that SESAR JU and the Agency will in fact establish mutual voluntary arrangements for the validation of the SESAR results also from the regulatory point of view, as early as possible.

In order to achieve this, SES and EASA regulations will have to be harmonised to avoid any overlaps or gaps in the safety regulatory system. EASA will prepare general implementing rules and guidance material to meet safety objectives. Following our principle of proportionality, these rules must be proportionate to safety objectives. Our implementing rules will be built on existing legislation, namely the provisions of the SES, in particular the transposed EUROCONTROL Safety Regulatory Requirements (ESARRs), the "common requirements" for the providers and the Directive on ATCO. There will be no additional layer of regulation: the common safety rules substitute national rules and create the basis for a common transposition of ICAO SARPS. Moreover, our rules will be aimed at creating a level playing

field, which is especially important for European SMEs, including Air Navigation Service Providers and aerodromes.

***Concerning the accidents, do you consider that 2007 was a rather good year for Europe? Is the general trend satisfactory, let's say since the five last years?***

Based on our Annual Safety Report, which is published on our website and available to every EU citizen, 2007 was a good year for aviation safety in Europe. The number of fatal accidents in commercial air transport dropped from six in 2006 to three in 2007 and is one of the lowest in the decade. In 2007, only five per cent of all accidents in commercial air transport worldwide occurred with aeroplanes registered in a Member State of EASA. The fatal accident rate of scheduled passenger operations is significantly lower in Europe than in the rest of the world. Worldwide the number of fatal accidents in the same type of operation increased from 36 in 2006 to 54 in 2007 and is above the decade average (52). Nevertheless, and despite the recent tragic accident of a Spanair MD-82 on 20 August 2008 which caused 154 fatalities, the trend for the decade still indicates that the number of accidents worldwide in commercial air transport is declining.

***Considering the near-future, what are in your opinion the main challenges to be taken up and the main difficulties to be surmounted?***

Taking into account the expected growth of air travel, mainly in the emerging markets, the main challenge is to improve safety even further and to make aviation more environmentally sustainable. This is a truly global objective to which Europe and EASA are already fully committed.

In order to meet this challenge, EASA will need to secure the necessary know-how and resources. As a regulatory body with rapidly increasing responsibilities we will need at all times to be at the cutting edge of aviation trends and technology.

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## SESAR



***The Single European Sky ATM Research (SESAR) activities and the corresponding Joint Undertaking (SESARJU) are currently the subjects of numerous publications, discussions and questions. The CEAS bulletin starts a series of articles describing the background, the current status and the coming Long-Term Innovative Research (LTIR) Programme within this framework.***

***The author Prof. Dr. Peter Hecker is member of the***

***Administrative Board of the SESAR JU. In addition Prof. Hecker acts as member of the board of directors of the "Association for the Scientific Development of ATM in Europe" (ASDA). The first article will cover the basic background of SESAR, the underlying process and its current status.***

## The Air Transport System - Challenges

Mobility is one of the most essential demands of today's society world-wide. Economical growth and development urgently require highly reliable modes of safe, efficient and environmentally friendly transportation of passengers and

goods. Being part of the global inter-modal mobility network, the air transport system has developed continuously to meet the challenges of growing demand in quantity and quality of transport capacity. Considerable improvements in ATM systems, aircraft systems, airports' technical equipment and organisational structures have been achieved so far. Nevertheless, the desired breakthrough towards a highly interoperable, safe and cost-efficient air traffic regime remains pending. One potential reason for this may be seen in the fragmentation of technology, national rather than operational considerations and a questionable level of uncoordinated and parallel developments in procedures, technology and systems.

### The SES initiative

To overcome this difficulty, an initiative was launched in 1999 under the name Single European Sky. The SES lays down the legislative and regulatory foundations for future actions. Four European Commission regulations were adopted in 2004, defining the scope of required activities. These are:

- **The framework regulation** establishing a harmonised institutional and regulatory framework for the creation of the SES,
- **The service provision regulation** establishing requirements for the safe and efficient provision of these services in the Community,
- **The airspace regulation** establishing the conditions and requirements for creating transnational functional airspace blocks, and
- **The interoperability regulation** aiming at achieving the interoperability of the European Air Traffic Management Network [1].



Photo: Fraport AG

The SES framework is complemented by the “Single European Sky ATM Research” programme. SESAR is intended to pave the way for the implementation of technical, operational and organisational changes and improvements.

### SESAR: definition – development - implementation

Being the “operational” part of the legislative packages of the Single European Sky initiative, SESAR proposes a new approach to reform the ATM structure in Europe. For the first time in the history of air transport research, an integrative and co-operative approach among all stakeholders has been chosen. Within three subsequent phases, a commonly agreed European ATM Master Plan is being defined, developed and deployed.

- **Definition phase** (2005-2008) delivers an ATM master plan defining the content, the development and deployment plans of the next generation of ATM systems.
- **Development phase** (2008-2013) produces the required new generation of technological systems and components as defined in the definition phase
- **Deployment phase** (2014-2020) is a large-scale production and implementation of the new air traffic management infrastructure, comprising fully harmonised and interoperable components which guarantee high-performance air transport activities in Europe.

The “Definition Phase” aimed at the establishment of a commonly agreed European ATM Master Plan. A 30-partner consortium led by Air Traffic Alliance succeeded in producing 6 highly acknowledged deliverables (D1-D6). These reports cover the whole chain from the analysis of the current ATM framework situation up to a recommendation for the future Work Programme.

**D1** : Air Transport Framework - the Current Situation

**D2** : Air Transport Framework - the Performance Target

**D3** : Definition of the future ATM Target Concept

**D4** : Selection of the “Best” Deployment Scenario

**D5** : Production of the SESAR ATM Master Plan

**D6** : Work Programme for 2008 - 2013

The individual expertise of major organisations involved in



the air transport system as, for instance, airspace users, air navigation service providers (ANSPs), airports and the supply industry was combined to form the results of the definition phase in a consistent way. A number of associated partners, including safety regulators, military organisations, pilot and controller associations and research centres working together with Eurocontrol supported this process.

The European ATM Master Plan and the corresponding Work Programme now form the basis for the transition from the definition phase to development and implementation.

### SESAR JU - The Joint Undertaking

Taking into account the number of parties being involved in SESAR and the financial resources and technical expertise needed, a legal entity capable of ensuring the management of the funds assigned to the SESAR project during its development phase was created. On 27 February 2007, the SESAR Joint Undertaking was established under European Community law. The SESAR JU is responsible for:

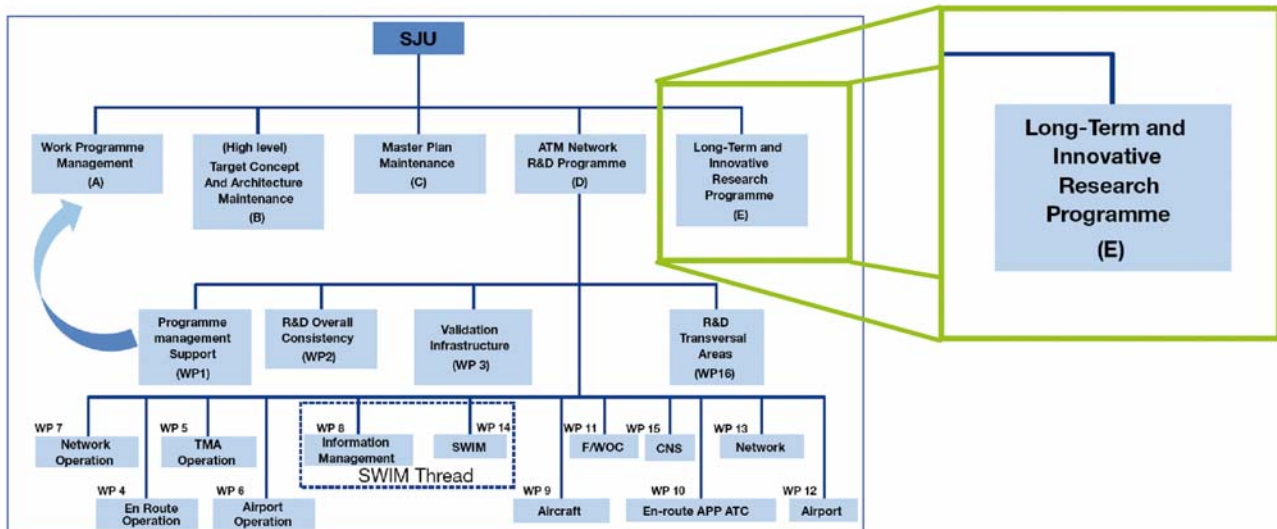
- securing the appropriate funding for the Programme, and focusing all relevant European Research and Development resources on SESAR;
- defining and updating the SESAR work programme in accordance with the work progress;
- ensuring consistency, efficiency and technical progress on all items of the work programme;
- reporting on the development phase results and preparing relevant actions for the implementation of these results.

Executive Director is responsible for the day-to-day management of the Joint Undertaking and is its legal representative. Currently, the SESAR JU is in the process of building up the underlying organisation to full operability. At the same time, a process was started to extend the number of members in order to strengthen the basis on which the activities during the development phase of SESAR are managed and pushed forward. Starting with the two founding members, the European Community represented by the European Commission and EUROCONTROL, represented by its Agency, membership negotiations with 15 pre-selected candidates and 4 proposed candidates for later accession are being carried out. It is expected that the membership process will be finalized shortly.

### The Work Programme and Long-Term Innovative Research

The work programme is the main guidance along which the development phase will be carried out. The first level of the “Work Breakdown Structure” (WBS) of the development framework consists of five major work packages WP A to WP E covering the work programme management (WP A), the target concept and architecture maintenance (WP B), the master plan maintenance (WP C), the ATM network R&D programme (WP D) and the long-term innovative research programme (LTIR, WP E).

Work Package D itself consists of a consolidated and integrated Work Programme called “ATM network R&D pro-



First level of WBS of the SESAR development framework [2]

The governance of the SESAR Joint Undertaking is ensured by the Administrative Board and the Executive Director. The Administrative Board is composed of representatives from each of the members of the Joint Undertaking as well as representatives from stakeholder groups. The Administrative Board is chaired by the representative of the Commission. In 2007, the Administrative Board appointed Mr Patrick Ky as Executive Director of the SESAR Joint Undertaking. The

gramme”. It is made up of another 16 WPs covering transversal threads, operational threads, system threads and threads concerning the “System-Wide Information Management” (SWIM). It aims at developing new SESAR Operational Improvements and associated enablers progressively for the integration into the European ATM network in order to enhance its capacity, safety and efficiency. For the scientific community, Work Package E titled “The

Long-Term and Innovative Research Programme” (LTIR) is of specific interest. Currently, the scope of WP E is being refined and detailed. Proposals for the instruments of the LTIR Programme, such as SESAR Research Projects and SESAR Research Networks are discussed and a potential management framework is in the process of being defined. It is expected that within the coming months the Administrative Board will decide on the proposals. Consequently the LTIR Programme is expected to be launched immediately and a vital ATM research environment will be established.

*The following article on SESAR will cover the Long Term Innovative Research in more detail.*

**REFERENCES:**

This article is based on material from the following sources:  
 [1] “The SESAR Initiative” by DG Energy and Transport  
 [2] “Work Programme for 2008-2013 / Deliverable D6”  
 Issued by the SESAR Consortium for the SESAR Definition Phase Project co-funded by the European Commission and EUROCONTROL  
 SESAR JU website [www.sesarju.eu](http://www.sesarju.eu)  
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## The RAeS/CEAS Conference on “Aircraft Structural Design” – Liverpool, 14-16 October 2008



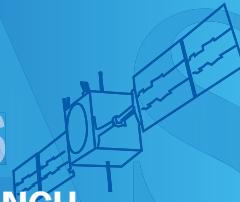
*The conference addressed current research and thinking about the type of civil aircraft structures required to sustain a growing, but threatened, industrial sector. It also covered advances in design methods and methodologies, together with computational methods to support the creation of advanced designs.*

An innovative feature was an invited lecture from the Tyndall Centre on the implications for a growing aviation sector of climate change and carbon budgets. A keynote by Prof Ian Poll (Cranfield) presented an aeronautical view of the same set of problems. Many contributed papers addressed these issues; examining the opportunities to moderate environmental impact through the use of composite materials, novel designs and the manipulation of flight regimes. The development of multi-disciplinary design tools and tools that also include multiple disciplines was an important topic area. A keynote by Charbel Farhat (Stanford) illustrated how complex aeroelastic phenomena can be modelled and flight tests reduced through the development and application of complex multi-disciplinary tools. A second keynote in this topic area by Andy Keane (Southampton) showed how MDO tools can be applied in the design of complex structures leading to significant design improvements.

In order to speed up the design process it is necessary to rely less on actual testing and more on analysis unsupported by test. This theme was addressed by several presenters who developed the concept of virtual testing coupled with the need to ensure that computer simulations generate structures that can be guaranteed safe in operational use.

**Full conference proceedings are available from the Royal Aeronautical Society at [www.aerosociety.com/proceedings](http://www.aerosociety.com/proceedings)**





## More R&T for Safer Programmes

by Jean-Jacques Tortora



Jean-Jacques Tortora is Secretary General of ASD-EUROSPACE.

R&T is essential to develop new innovative solutions to enhance the performances of space systems. However, R&T is also essential to fully qualify new technologies to make them available to operational programmes at risk mitigated conditions.

The latest steps of the development of a new technology before its effective availability through a recurring production consist in qualification and industrialisation. The use of in situ testing facilities, the risks associated to tests realised at a late stage of developments, the investment in production capabilities, etc... generally imply costs that are significant as compared to the overall development cycle of a product.

European institutional R&T programmes are most often focused on technological prospective and innovation. These aspects are of course essential to best prepare the future. However, they generally do not provide for qualification and industrialisation.

In Europe, civil Space is traditionally funded by Research ministries which do not necessarily consider these ultimate stages of development as part their mission. As a matter of fact, it is generally admitted that such costs should be covered by industry or users. This approach makes sense when the development is backed by a solid business case. Unfortunately, in space business, this is still far from being the rule, as the limited recurring production is most often unable to justify such investments at industry level.

With respect to space telecommunications, where commercial customers are particularly risk adverse and require the use of fully proven technologies, industry can fortunately rely on the ESA ARTES programmes (Advanced Research in Telecommunications Systems), which efficiently cover the development of technologies and products up to advanced levels of readiness.

In other areas, once a new technology has been demonstrated through early stages R&T activities, operational programmes needing it shall provide for their actual qualification. From a

strict budgetary perspective, this is just in theory a transfer of charge. However, practically, these costs are transferred with associated risks.

Higher risks for programmes have multiple implications, from delays to cost overruns, less and less accepted by policy makers. Many studies confirm how much technology readiness is key to the full success of a programme.

In Europe, taking into account this reality would require of course a significant increase of the budgetary envelope devoted to space R&T, with the perspective of recovering most of this investment through improved programmes management. But beyond financial resources it would also be necessary to adapt the implementation rules of R&T programmes to reach higher steps of readiness level as well as to develop the offer for in orbit demonstration, which is the ultimate stage of space qualification.

If properly funded by member states, ESA GSTP 5 could be an efficient tool to meet these expectations.

### ASD-EUROSPACE

The Space group in ASD

Eurospace is the professional association of the space industry. As such, it is the reference body for consultation and dialogue within the industry, the main focus being space policy and strategy.

Its members are the main European space systems manufacturers and launch services providers. The membership covers 13 European countries, with national representation balancing the importance of each nation's space segment.

In 2004, Eurospace became the Space Group of ASD (AeroSpace and Defence industries association of Europe), representing space interests.

Active Working Groups and Panels:

- Policy Committee
- ECCS - Eurospace is the space industry standardisation body
- EEE Electronic parts and components
- Security & Defence
- GMES (Earth Observation)
- Navigation (Galileo)
- Research and Technology- Eurospace is the official industry representative to the European Space Technology Harmonisation process and ESTMP
- Space Industry Markets
- IPR and legal affairs

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## ABOUT THE SUCCESS OF JULES VERNE

*On 9 March 2008, ESA's Jules Verne, the first of five Automated Transfer Vehicles (ATVs) was launched on Ariane-5 from Europe's Spaceport, Kourou, French Guiana. On 29 September 2008, with a perfectly controlled re-entry high above the Pacific Ocean, it successfully completed its six-month inaugural mission, opening a new era for European space transportation and achieving a key milestone for human spaceflight and space exploration. Together with Russia's Progress and the NASA Space Shuttle, it has become the third spacecraft type with the capability to resupply the International Space Station (ISS) on a regular basis. For more than a decade, ATV has involved thousands of high-tech workers in dozens of companies from ten European nations under the prime contractor EADS Astrium. Russian companies were also involved, with the main contractor, RSC Energia, in charge of providing 10% of the ATV development (docking and refueling systems and assorted electronics).*

*For the first time, the new ATV Control Centre in Toulouse acted as the lead Mission Control Centre in charge of manned operations for the ATV, while the Mission Control Centres in Moscow and Houston supported and authorised the rendezvous to the ISS.*

*From 2008, a team of 80 people from CNES, Astrium and ESA based in Toulouse will now coordinate all ATV operations on behalf of ESA for the next four ATVs planned until 2015.*



*The first Automated Transfer Vehicle (ATV) in space.*

### THE ATV'S HISTORY MAIN DATE

- 1994 - 111<sup>th</sup> ESA Council in Paris agrees to the Manned Space Transportation Programme, including ATV.
- 1995 - The Ministerial Council in Toulouse formally approved full programme development. Ten countries – France, Germany, Italy, Switzerland, Spain, Belgium, Netherlands, Sweden, Denmark, Norway – commit to developing the Columbus laboratory and ATV.
- 1998 - Full development contract signed with Aero-spatale, now EADS Astrium. Europe and Russia reach a general agreement on the integration of ATV into the Russian segment.
- 2000 - Manufacturing starts.
- 2002 - ATV Service Module is integrated with the Avionics and Propulsion module at Astrium in Bremen. The pressurised Cargo Carrier module the ATV's forward half that provides cargo storage and a workplace for the astronauts, is built at Thales Alenia Spazio, Turin.
- 2003 - The Service Module and Cargo Carrier are first integrated in Bremen. The Critical Design Review certifies that the design and operations concept meet requirements for performance, reliability and safety. The Functional Simulation Facility starts to test the ATV's electronic "brain" and flight software in computer simulations at EADS Astrium, Les Mureaux.
- 2004 - The ATV is transferred to ESTEC, Noordwijk, for acoustic, thermal, electromagnetic and functional testing.
- 2007 - The ATV is shipped to Kourou.
- 2008 - Final Assembly Building, Kourou. On 25 February, the fairing is closed over the ATV, ready for launch.

### THE JULES VERNE MISSION

#### THE LAUNCH

*On 9 March 2008, the launch took place. Lifting twice its usual payload mass, the Ariane-5 upper stage performed an initial eight-minute burn over the Atlantic Ocean and entered a 45-minute coast phase, flying over Europe and Asia before reigniting for a 40-second circularisation burn over Australia. The ATV was delivered into the planned 260 km altitude orbit, and the critical automatic operations to secure power autonomy (solar panels deployment and orientation) were carried out.*

#### THE RENDEZ-VOUS WITH THE INTERNATIONAL SPACE STATION

*On 3 April 2008, ATV Jules Verne became the first spacecraft ever to self-navigate in orbit and control its own rendezvous with a manned space station, based solely on the use of relative GPS and optical sensors.*



## APPROACH AND DOCKING

Five days after launch, and far away from the ISS, Jules Verne successfully demonstrated the Collision Avoidance Manoeuvre (CAM), which consisted of braking the orbital speed by 5m/s, then stabilising the spacecraft in a safe orbit, in a minimal “survival” mode pointing at the Sun, using a completely independent functional chain.

Due to other traffic to and from the ISS, the free-flight phase was extended from 10 to 25 days before docking. This allowed NASA to launch the Shuttle Endeavour on a 16-day mission carrying the first element of the Japanese Kibo science lab and demonstrated the flexibility of the complete system. For future ATV missions, docking with the ISS will happen much earlier.

**The first approach** on 29 March demonstrated that the ATV could automatically calculate its position and manoeuvre with respect of the ISS using GPS navigation. It performed the “escape” manoeuvre some 3500 m behind the ISS.

**The second approach**, two days later, tested close-proximity manoeuvring and control, including contingency manoeuvres for both the ATV Control Centre and the crew onboard the ISS. It provided ultimate proof that Europe’s resupply vessel was ready for final and safe rendezvous and docking.



The first ATV “Jules Verne” was launched on 9 March 2008 on a modified Ariane-5.

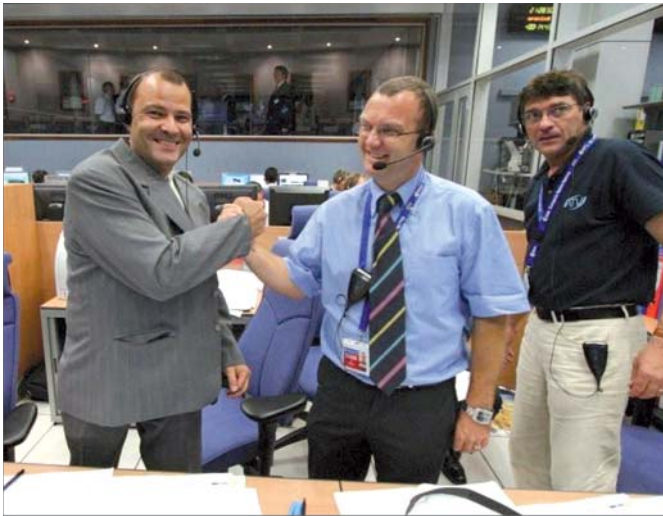


Volkov and Kononenko transferred 1150kg of dry cargo from Jules Verne to the ISS

Expedition 17 crew Greg Chamitoff, Oleg Kononenko and Sergei Volkov retrieve original 19th century Jules Verne manuscripts. Because of its comfortable size, ATV was used by two of the crew as a new area to sleep and wash



Expedition 16 and 17 crew members inside ATV: Garrett Reisman, Peggy Whitson, Yuri Malenchenko, Sergei Volkov and Oleg Kononenko



*Martial Vanhove, CNES Flight Director for undocking, Kris Capelle, ESA Mission Director for undocking, and Hervé Come, ESA ATV Mission Director celebrate after the successful departure from the ISS.*

**The third approach**, led to the first planned docking attempt. The ATV paused at 250 m, 20 m, and 12 m, guided only by its on-board high-precision optical navigation system. It closed in with the ISS at a relative speed of 1.4 km/h, slowing to 0.2 km/h while both spacecraft were flying in close formation at an absolute speed of 28000 km/h. **Jules Verne was successfully docked with the ISS on 3 April 2008 at 14:41 UT, 341 km above the southern Atlantic Ocean, just south of the equator and east of South America.**

The final phases of approach and docking were monitored under the watchful eyes of ISS Commander Peggy Whitson and Flight Engineer Yuri Malenchko. With the ATV securely attached, the ISS entered the pressurized cargo section and started to remove the payload. The ATV fuel tanks were connected to the plumbing system of the ISS, and the three ISS crew members – Sergei Volkov, Oleg Kononenko, Greg Chamitoff – manually transferred 269 litres of water and released 21 kg of oxygen directly into the ISS.

#### **FOR FIVE MONTHS, JULES VERNE IS PART OF THE ISS**

In June, the entire 811 kg cargo of refueling propellant was automatically transferred to the ISS. In August, the crew moved dozens of white cargo bags from the ATV, as well as two original manuscripts handwritten by Jules Verne and a 19<sup>th</sup> century illustrated edition of his novel *From the Earth to the Moon*.

The crew also worked hard carrying items in the opposite direction, loading waste and excess equipment from the ISS into the racks and spaces left empty inside the ATV. The

total dry cargo waste loaded into ATV represents 900 kg of material no longer needed on the ISS. On top of that, 264 kg of liquid waste was transferred from the ISS to the ATV in foldable plastic containers.

***For five months the ATV was a 48 cubic metres pressurised and integral part of the ISS, and has boosted the ISS orbit to overcome the effects of residual atmospheric drag four times.***

#### **DEPARTURE AND REENTRY**

The ATV Control Centre sent the commands to open the hooks of the ATV, which then performed a fully automated **undocking on 5 September 2008 at 21:30 UT. On 29 September 2008**, ATV's main engines used their remaining fuel in two separate de-orbit boosts to terminate its three-week solo flight. The 13.5 tonnes spacecraft fell on a steep flight path, performing a controlled destructive reentry high above an uninhabited area of the South Pacific Ocean. All Jules Verne's mission objectives were fulfilled.

#### **ABOUT THE FUTURE**

For the four following ATVs, the capabilities will be slightly increased: launch mass 20.7 tonnes – cargo 7.5 tonnes. Future ATVs will carry at least one tonne more than Jules Verne.

With today technology, ESA has gained the capability for automatic rendezvous between spacecraft, which is crucial for future human planetary exploration, complex spacecraft assembly and sample-return missions.

The ATV is already the most powerful space tug ever built. If required in future programmes, the ATV could evolve to be used as a transfer vehicle, carrying infrastructure elements and tonnes of supplies into orbit, including crew habitats and orbital infrastructures for successive assembly in low Earth orbit, in preparation for missions to the Moon and beyond.

J.-P. S. The present paper is an abstract of the article "Jules Verne's Journey – From Earth to ISS" (John Ellwood, Heinz Wartenberg, Jean-François Clervoy, Frédéric Castel, Alberto Novelli, Hervé Come) published in the ESA Bulletin N° 136, November 2008.

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## 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). Following its establishment as a legal entity conferred under Belgium Law, this new organisation began its operations on 1<sup>st</sup> 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 2008 are:

- **President :** Dr Georges Bridel – georgesbridel@aol.com
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- **Editor-in-Chief, CEAS Quarterly Bulletin :**  
Dr-Ing. Jean-Pierre Sanfourche – jpsanfourche@dbmail.com

## Among the Main Coming Events 2009

- **3-4 February:** RAeS – SurTech2009 - The Changing World of Surveillance - Surveillance Technology Conference - London.
- **9-13 February:** DGLR - GAMM Meeting - Gdansk, Poland.
- **26 February:** RAeS - Evolution of Combat Capable Unmanned Air Systems and weapons - Weapon Systems & Technology Group Conference - Boscombe Down, Salisbury.
- **5 March:** RAeS - Air Laminar Flow: Who bears the costs of terrorism? Allocating the risk under the draft ICAO Unlawful Interference Convention. - Air Law Seminar-London.
- **18-19 March:** RAeS - Corporate, Air Taxi & Personal Jets: Current Challenges and Future Prospects - London.
- **24 March:** RAeS - Finding the Right Stuff: The Medical Selection Aircrew and Astronauts - Aerospace Medicine Group - London.
- **26-27 March:** DGLR - Aircraft Systems Technologies (AST 2009) - Hamburg.
- **8 April:** RAeS - Concorde - The Supersonic Achievement: 40<sup>th</sup> Anniversary Concorde Conference - London.
- **21-23 April:** RAeS - Aerospace 2009: Facing up to the Future - RAeS Annual Conference - London.
- **11-13 May:** CEAS - 15<sup>th</sup> AIAA/CEAS Aeroacoustics Conference - Miami, USA - glegg@oe.fau.edu - www.aiaa.org/events/aeroacoustics
- **12-14 May:** DGLR - Key Aerodynamic Technologies (CEAS/KATNet II) - Bremen.
- **25-29 May:** NVvL - 31<sup>st</sup> Conference and 25<sup>th</sup> Symposium of the International Committee on Aeronautical fatigue (ICAF) - "Bridging the gap between theory and operational practice" - Rotterdam. nvl@nlr.nl - www.icafe2009.nl
- **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.
- **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 - 20<sup>th</sup> National congress of AIDAA - Milan. www.aidaa2009.org
- **30 June:** RAeS - Space Tourism - Space Group Conference - London.
- **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.drlk2009.dglr.de
- **10 September:** RAeS - Handley Page Ltd - Celebrating the Centenary of the first British Aircraft Company - Historical Group Conference - London.
- **22-25 September:** DGLR - 35<sup>th</sup> 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 - nvl@nlr.nl - www.icas.org
- **29 September-1<sup>st</sup> October:** 3AF- Space & Defence International Conference - Paris - lisa.gabaldi@aaaf.asso.fr
- **14-16 October:** DGLR - IMAPP Conference - Hamburg.

• **26-29 October:** Manchester (UK), 2<sup>nd</sup> CEAS European Air & Space Conference 2009. Cf. pages 2-3.



- **6 November:** RAeS - Aerospace & Aviation Careers Fair
- **16-18 November:** 3AF- Optronics Conference - Paris - secr.exec@aaaf.asso.fr
- **18-19 November:** RAeS - Fixed-wing and Rotary-wing FSTDs - The way ahead - Autumn Flight Simulation Conference - London.

### Electronic addresses:

- 3AF - secr.exec@aaaf.asso.fr - www.aaaf.asso.fr  
 - AIDAA: a.castellani@aidaa.it - www.aidaa2009.org  
 - DGLR: geschaeftsstelle@dglr.de - www.dglr.de  
 - NVvL: nvl@nlr.nl - www.nvl.org  
 - RAeS: conference@aerosociety.com - www.aerosociety.com/conference

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★ **CEAS 2009 European  
Air and Space Conference**

26 – 29 October 2009

Manchester, UK

**Call for Papers**

[www.ceas2009.org](http://www.ceas2009.org)



New beginnings:  
**challenges for aerospace innovation**

presented by



# ★ CEAS 2009 European Air and Space Conference

26 – 29 October 2009  
Manchester, UK

## Announcement

CEAS 2009 will be the second CEAS European Air & Space Conference following the very successful hosting of CEAS 2007 by DGLR of Germany in Berlin during September 2007. Attendees will be addressed by senior political, industry and academic figures with a common interest in the continuing success of the European and global aerospace enterprise.

CEAS 2009 will be the major event in the European aerospace calendar during 2009. It will attract aerospace professionals, companies and organisations not only from across the European Union but also from other major global aerospace nations. It is expected that there will be up to 1000 attendees and that 400-500 technical papers will be presented.

It will offer companies, research and academic institutions and CEAS partner nations a unique opportunity to showcase their brands, products and technologies by direct sponsorship; presentation of technical papers, posters or stands; and a range of other forms of engagement, building on the success of CEAS 2007 in promoting European aerospace and establishing links and technical networks across Europe and further afield.

The Royal Aeronautical Society (RAeS) will be hosting CEAS 2009 on behalf of the CEAS community. The RAeS is the world's oldest aerospace society and is a founder member of CEAS. The RAeS is a not for profit organisation committed to furthering the art, science, engineering and business of aerospace and aviation.

## Submission of Abstracts

Abstracts of 500-1000 words should be submitted online at [www.ceas2009.org](http://www.ceas2009.org) by **12 January 2009**. Selection will be made on the abstract content and applicability to the final published programme. Final written papers, fully cleared for publication and presentation at an open conference, should be submitted online by **17 August 2009**. All papers will be included in the Conference Proceedings, available free to delegates. Accepted papers may be considered for publication in the RAeS Aeronautical Journal, subject to the refereeing process.

Please note that papers should avoid marketing or sales content, neither of which is appropriate.

## Call for Papers

The conference theme is 'New beginnings: challenges for aerospace innovation' and is intended to orient technical contributions towards work aimed at providing exciting and innovative solutions for the technical, industrial and environmental challenges of the second century of flight, new horizons in space and developments in military air power.

## The conference organisers seek papers on all subjects including:

- aerodynamics
- air traffic management and flight operations systems and technologies
- air-space planning
- airworthiness and maintenance
- fuels
- future cockpit design and avionics
- human factors
- propulsion
- materials and structures
- systems and sub-systems
- safety and security
- tools, technologies and techniques
- the European aerospace research and development infrastructure
- new challenges such as
  - commercial space exploitation
  - innovative designs and configurations
  - emergent industries and markets
  - unmanned air systems

It is intended that the conference should offer the international aerospace community the world's most comprehensive showcase for innovation, research, technical developments and studies across both civil and military air and space applications. The technical programme will be designed and managed jointly by representatives from the CEAS Air and Space Technical Committees and the RAeS Specialist Groups. The event will play host to both the RAeS 2009 Air Travel – Greener by Design and Unmanned Air Systems conferences. Papers previously presented at ICAS 2008 in Anchorage, Alaska will be eligible for submission under the terms of the CEAS/ICAS Agreement as will those presented at CEAS member Society annual conferences in 2009 and at the 2009 European Rotorcraft Forum. CEAS 2009 will feature a European Young Aerospace Professionals event aimed at launching a European Young Aerospace Professionals Forum to feature in future CEAS conferences and to aid networking and dissemination of ideas among younger members of the air and space communities.

# New beginnings: challenges for aerospace innovation

[www.ceas2009.org](http://www.ceas2009.org)

Call for Papers

## Key Dates & Deadlines

### Abstracts submitted by:

12 January 2009

### Notification to authors by:

27 February 2009

### Programme issued:

30 March 2009

### Papers submitted by:

17 August 2009

### Conference:

26-29 October 2009

## Sponsorship & Exhibition

Approximately 1000 specialists from all over the world are expected to attend this premier event in the air and space calendar. A wide range of promotional and branding opportunities are available for the Conference in addition to the availability of exhibition space. For more information or to discuss these sponsorship packages, please contact: RAeS Conference & Events Department tel: +44 (0)20 7670 4345 or email: [lorraine.reese@aerosociety.com](mailto:lorraine.reese@aerosociety.com)

## Venue

Competing with Birmingham or Edinburgh for the title of 'the UK's second city', Manchester, home to Manchester United Football Club and at the centre of one of Europe's leading aerospace industrial clusters, is an ideal venue for CEAS 2009.

The event will take place in the award winning Manchester Central international convention complex. The 1900m<sup>2</sup> Manchester Central Exchange Hall will be the CEAS 2009 catering and exhibition suite. Manchester Central is only some 20km north of Manchester Airport and is readily accessible by bus, train and taxi. The complex is well served by major international standard hotels close nearby.

## Programme

The conference programme will feature a number of key events as follows:

**Day 1: Formal opening, press conference;** Sponsors and Exhibitors Welcome Reception, Manchester Central

**Day 2: Opening plenary and keynote;** Civic Reception and Networking Event, Palace Hotel

**Day 3: Gala Dinner,** Manchester Airport Aviation Viewing Park Concorde Suite

**Day 4: Closing plenary**

**Day 5: Possible technical tours and local visits**

## Language

English will be the official language at the Conference. There will be no simultaneous translation.

## Social Events & Technical Visits

The conference registration fee will include a welcome reception and civic reception and delegates are entitled to a reduced fee for the conference gala dinner. A partners programme will be offered throughout and visits to local points of interest, firms and academic institutions are being considered for Friday 30th October 2009.

Opportunities are likely to include: Manchester Cathedral, Town Hall, Museum of Science & Industry and Manchester University. The Arndale Shopping Centre is also nearby and the Imperial War Museum North is some 15 minutes away by tram. Manchester United's Old Trafford stadium is situated to the south.

## Sponsors and Exhibitors

### Welcome Reception

To be held in the award winning Manchester Central international convention complex.

### Palace Hotel Civic Reception and Networking Event

To be hosted in the Grand Room of Manchester's landmark Palace Hotel, a magnificent terracotta Grade II listed building, originally home to the Refuge Assurance Company and highly evocative of Manchester's industrial and commercial heritage.

### Gala Dinner, Manchester Airport Aviation Viewing Park Concorde Suite

The Gala Dinner will be held in the Concorde G-BOAC hangar/restaurant complex in the area next to the aircraft itself. Guided tours around the aircraft will be on offer and if weather permits delegates will be free to view the airport runway from the adjacent viewing mound. The Manchester Airport Aviation Viewing Park is situated some 20 minutes by coach or car from Manchester Central; transport by coach will be provided.

## Royal Aeronautical Society

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