



The Quarterly Bulletin of the

CEAS

COUNCIL OF EUROPEAN AEROSPACE SOCIETIES

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



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"CHALLENGES IN EUROPEAN AEROSPACE"

THE FIFTH CEAS EUROPEAN AIR & SPACE CONFERENCE WILL TAKE PLACE IN THE PRESTIGIOUS DELFT UNIVERSITY OF TECHNOLOGY (NL) FROM 7 TO 11 SEPTEMBER 2015.

CEAS

WHAT IS THE CEAS ?

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

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

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

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

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

Its Head Office is located in Belgium:

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

WHAT DOES CEAS OFFER YOU ?

KNOWLEDGE TRANSFER:

- A well-found structure for Technical Committees

HIGH-LEVEL EUROPEAN CONFERENCES

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

PUBLICATIONS:

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

RELATIONSHIPS AT A EUROPEAN LEVEL:

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

EUROPEAN PROFESSIONAL RECOGNITION:

- Directory of European Professionals

HONOURS AND AWARDS:

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

YOUNG PROFESSIONAL AEROSPACE FORUM

SPONSORING

THE CEAS MANAGEMENT BOARD

IT IS STRUCTURED AS FOLLOWS:

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

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

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EDITORIAL

CEAS2015 WILL BE HELD IN THE PRESTIGIOUS DELFT UNIVERSITY OF TECHNOLOGY



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

Less than nine months after the successful CEAS2013 Conference held in Linköping (Sweden), we are already actively preparing CEAS2015, which will be the fifth edition of the biennial CEAS European Air & Space Conference and for which we have chosen the motto:

'CHALLENGES IN EUROPEAN AEROSPACE'

Hosted by NVvL, the Netherlands Association of Aeronautics and Astronautics, it will take place from 7 to 11 September 2015 within the prestigious University of Technology of Delft. As it can be seen in the Call for Papers included in the present bulletin (pages 7-8) the topics programmed to be dealt with are numerous and among them, there is one for which the CEAS pays very high attention, the one related to aerospace students and young professionals. This is why the Delft University of Technology (DUT) is a particularly judicious choice for holding the event. With its eight faculties, among which the Faculty of Aerospace Engineering of high reputation in our community, its numerous research institutes, hosting over 19,000 students and more than 3,300 scientists, it is an impressive unit.

Education and Training constitutes quite a decisive challenge to be taken up so evident is it that the future of the aerospace in Europe is in the hands of students and young professionals.

- How to attract the most promising scientific and technical students in the aerospace careers?
- How to effectively co-ordinate and harmonize the teaching of aerospace in the different countries of the European Union with a view to progressing better and better towards a united European Aeronautics and Space Community?

There is no doubt that in the DUT environment and with the involvement of 'Leonardo da Vinci VSV' –

association of the DUT students in aerospace engineering –, of EUROAVIA – the European Association of Aerospace Students –, of PEGASUS (Partnership of a European Group of Aeronautics and Space Universities) and of the EASN (European Aeronautics Science Network), we should be placed in optimal conditions.

Of course even if the educational topic will take on importance, all other subjects will also give rise to high standard presentations and debates, and from now on the organisers are on the go.

Last but not least, known worldwide for its Delftware, Delft is a beautiful historical town in essence a miniature version of Amsterdam with the same pretty canals and stately canal houses, possessing a number of interesting museums and surrounded by nice nature: as many non negligible touristic aspects which will contribute to the success of CEAS2015.

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PRESIDENT'S MESSAGE



At the AIAA-CEAS Symposium on Greener Aviation on March 12 in Brussels, I was invited to give a presentation on CEAS. It was good to be able to present to a large and very interested audience the CEAS membership, its objectives and activities, its international cooperation and its organisation.

In my message in the March 2014 Issue of the CEAS Bulletin I announced my intention to develop an updated Strategy for CEAS 2015-2025.

As a first step I drafted a letter to be sent to the Presidents of the CEAS Member Societies.

To investigate the elements to be addressed in this letter I had an informative meeting with the largest CEAS Member Societies, the RAeS. On April 9 I had the opportunity to have meeting in London with the RAeS president Mrs. Jenny Body and the Deputy Chief Executive Paul Bailey. At this meeting the RAeS acknowledged the value of CEAS for the RAeS in the fact that CEAS is a strong link for the RAeS towards European Institutions as the EU Parliament

and the Commission, ACARE, EREA etc. Many points were discussed in relation to European-wide planning and de-conflicting of aerospace conferences, making students enthusiastic for aerospace, student exchanges, organisation of places where the aerospace students could get practical experience, identification of "Eminent Speakers" that could provide important presentations for the individual CEAS Member, etc. The draft letter is presently being discussed at the 27th CEAS Trustees Board Meeting in Noordwijk on 10 June 2014.

After this meeting the finalized letter will be sent to the Member Societies and as far as feasible, I wish to discuss it in a meeting with the individual Presidents and their advisors/board members.

On July 4 I have succeeded in having a meeting with the President of the French CEAS Member Society, Mr Michel Scheller in Paris.

In this CEAS Bulletin I will regularly keep you informed of the progress we are making towards the CEAS Strategy 2015-2025.

Fred Abbink, CEAS President

THE 26TH TRUSTEES BOARD MEETING OF THE CEAS WAS HELD ON 4TH OF MARCH 2014 AT ESA OFFICE OF BRUSSELS



The main topics which were dealt with are briefly summarized here below.

- **EUROAVIA and VKI** were proposed to become Corporate Members and both accepted. Their formal acceptance will take effect on next General Assembly meeting.

- **FINANCES.** Mr Paul Bailey presented the Report dated

3rd of March 2014 which confirms the sound situation of CEAS finances. Mr Celis and MS Melchinger, from the Belgian firm Intergest, joined the meeting to present the Service Agreement proposal for finance and legal services. The Board unanimously approved it.

- **CEAS MISSION, VISION AND STRATEGY 2015-2025**

President Abbink presented a discussion paper proposing a number of initiatives which could be engaged in order to develop CEAS's notoriety and power of influence within the European aerospace community. Among the

ideas expressed, he evoked the ICAS model, which in his view could be inspiring for CEAS strategy.

This discussing paper is presently being thoroughly reviewed by the Member Societies and will be published as soon it is finalized; in principle it will appear in the CEAS Quarterly Bulletin N° 3-2014 (October).

Three **Working Groups** have been created with a view to defining practical action plans for improving the CEAS functioning:

- **Strategy:** Mercedes Oliver Herrero, Fred Abbink, Paul Bailey, Pierre Bescond.
- **Students, Young Professionals and Education:** Jacqueline Chindea, Petter Krus, David Marshall, Franco Persiani.
- **Membership:** Paul Bailey, Pierre Bescond, Christophe Hermans, Kaj Lundahl.

- **CEAS AIR & SPACE CONFERENCE 2015**



CEAS2015 CONFERENCE will take place in the Delft University of Technology (NL) on 7-11 SEPTEMBER 2015.

NVvL will organise the event in partnership with the University of Technology of Delft.

> See the Call for Papers pages 7-8.

• **E-CAero 2**

CEAS will actively participate in the continuation of the E-CAero (European Collaborative dissemination of Aeronautical research and applications) project of the European Commission – ‘E-CAero 2’. The objective is to show unity and coordination among all European aerospace scientific and technical associations: ECCOMAS (European community on computational methods in applied sciences), EUCASS (European council of aerospace sciences), ERCOFTAC (European research community of flow, turbulence and combustion), EUROTURBO (European turbo-machinery conference), EUROMECH – European mechanics society) and CEAS. Developing a shared identity, coordinating and harmonizing our activities and services, and jointly promoting these will much better serve the European aerospace scientific and technical professionals from academia, research centres, industry and policy makers.

A structure is being set up to conduct the works, which is called **ECAA (European Community in Aeronautics and Astronautics)**: the ultimate goal is to establish an efficient and sustainable co-ordinating mechanism well defined, accepted and supported by all 6 partner societies. CEAS has been precisely designated to conduct the basic Work Package 1: ‘**Establishing and consolidating identity and structure of ECAA**’. To this end, a team has been constituted within CEAS, including Mercedes Oliver-Herrero, Pierre Bescond and Christophe Hermans.

A progress report of this project will be regularly published in our quarterly bulletin.

• **AWARDS**

- Pr Joachim Szodruch has been elected to receive the CEAS 2015 Award.

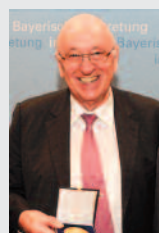
OBITUARY

CEAS learnt with great sadness the sudden and unexpected death of Prof. Dott.-Ing. Manfred Fuchs on 26 April.

After studying aviation engineering in Munich and Hamburg, he started his career in 1961 with space technology company ERNO in 1961, where he played a key role in Ariane-1, Spacelab and Columbus. In 1985, he entered a small company, Otto Hydraulik Bremen (OHB), fulfilling his dream of running his own business and laying the foundations of one of the most important European space technology companies, OHB AG.

In 1995 he was named honorary professor by the University of Bremen and received in 2005 an honorary doctorate from the Technical University of Milan.

He received several awards in recognition of his services, including the highest German distinction in technical sciences, the ‘Werner-von-Siemens Ring’, the ‘Golden Hermann Oberth Medal’, the ‘Sänger Medal’ awarded by the DGLR and recently, in March 2013 in Brussels, and recently the ‘CEAS Gold Medal’ by the CEAS.



On 6th of March 2013, on the occasion of the second Brussels Space Night of BDLI (German Aerospace Industries Association) which took place at the Representation of the Free State of Bavaria to the European Union), Rue Wiertz 77, Brussels, Manfred Fuchs received from the hands of CEAS

President David Marshall the CEAS Gold Medal.

CEAS AERONAUTICAL JOURNAL AND SPACE JOURNAL

Special offer to individual members of CEAS Member Societies



Each of these two journals can be ordered at a special rate of 60 Euros per year plus local VAT (this includes mailing the paper issues by Springer if the paper version is wanted) via the corresponding member society of CEAS. CEAS thus certifies that the interested member is indeed an individual member. Consequently, Springer would handle the invoicing process once the following information is provided through the society in question:

Society:.....
 First name:.....
 Last name:.....
 Institution:.....
 Street:.....
 City:.....
 Postal Code:.....
 Country:.....
 E-mail address:.....
 Space Journal or.....
 Aeronautical Journal?.....
 Paper or electronic version?.....

Call for papers**5th CEAS Air & Space conference
Challenges in European aerospace****Delft University of Technology, 7 – 11 September, 2015 (The Netherlands)**
**CHALLENGES
IN EUROPEAN
AEROSPACE**
5TH CEAS AIR & SPACE CONFERENCE


CEAS2015 will be a joint event featuring the fifth CEAS Air & Space Conference, 12th European Workshop on Aircraft Design Education EWADE, 20th ISPE International Conference on Concurrent Engineering and fifth Air Transport and Operations Symposium ATOS.

CEAS 2015 will be a unique opportunity for aerospace industries, academia, organizations and associations to communicate, share and debate innovative concepts and technical solutions in the aerospace domain. CEAS 2015 will promote the establishment of knowledge and technical networks with the aim of increasing European competitiveness in the field of aerospace.

Participation from all major nations involved in aerospace across the world, a wide exhibition area, special sessions on selected topics and specific actions to facilitate student's attendance will make CEAS 2015 one of the major European aerospace events.

CEAS 2015 will be hosted by NVvL (and in close cooperation with the Delft University of Technology DUT and the Society of Aerospace Students DUT – Leonardo da Vinci VSV) on behalf of the CEAS community.

CEAS – Council of European Aerospace Societies – is an organization bringing European national aerospace societies together for increased international strength. Today, CEAS comprises 16 member organizations with an outreach to roughly 35,000 professionals in aerospace. Since 2007, CEAS hosts biennial conferences on aerospace in Europe.

Key dates and deadlines

- | | |
|--------------------------|-------------------------------------|
| • 01 October 2014 | Abstract submission |
| • 01 January 2015 | Notification to authors |
| • 01 March 2015 | Final program and registration open |
| • 01 July 2015 | Full paper submission |
| • 07 - 11 September 2015 | CEAS 2015 Conference |

Instructions to authors

The Organizing and International Program Committees invite prospective authors to submit abstracts of original work for oral or poster presentation at the conference. Abstracts should be written in English and contain between 200-500 words. Authors should submit their abstracts in electronic format only by 1 September 2014. Selection will be made on the abstract content and applicability to the final published program requirement. Accepted scripts, fully cleared for publication and presentation, should be submitted by 1 July 2015.

Selected abstracts will be published in a printed book of abstracts; all written papers will be included in the conference proceedings and made available to delegates. Accepted papers may also be considered for inclusion in the CEAS journals, subject to the refereeing process.

It is important to note that papers should not have been published previously and should avoid inappropriate sales and or marketing content.

The submission address and guidelines for prospective papers to be included in the conference is published on the CEAS 2015 website.

Technical enquiries should be sent to the attention of the chairman of the Program Committee Christophe Hermans (CEAS branch chair aeronautics)

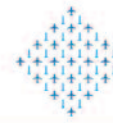
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Call for papers**5th CEAS Air & Space conference
Challenges in European aerospace****Delft University of Technology, 7 – 11 September, 2015 (The Netherlands)****CHALLENGES
IN EUROPEAN
AEROSPACE**
5TH CEAS AIR & SPACE CONFERENCE

Papers and other contributions will be sought to cover the following broad topic areas (conference tracks):

- Airworthiness challenges of new flight vehicle configurations and emerging technologies (like application of composite structures).
- European aerospace Defense technological base applied in multination programs: industry and operator experience with Eurofighter, A400M and NH90.
- Air transport over Europe connecting airport cities: flying more environmentally friendly at reduced cost (ATOS 2015 chairs: Ricky Curran, DUT; Kurt Klein, DLR).
- Cockpit of the future with reduced pilot interaction: trusting automation.
- Maintenance Repair and Overhaul: greater efficiency, consolidation and improving customization.
- Collaborative engineering in system design: integrated physical teams and virtual manufacturing (CE2015 chairs: Ricky Curran, DUT; Cees Bil, RMIT).
- Clean Space: developing new technologies to safeguard terrestrial and orbital environments, controlled re-entry, green propellants, removal of space debris (Luisa Innocenti, Jose Longo, ESA).
- Future education and training needs (life-long) for aviation engineers and researchers in Europe (Hester Bijl, DUT; Rolf Henke, DLR).
- Virtual hybrid testing in aeronautics and space: future role of large scale testing.

Potential contributors should note that also abstracts may be handed in about aerospace subjects like CFD, noise and greenhouse gas emissions, environmental effects, aircraft handling, flight testing, unmanned aerial vehicles, structures, materials and propulsion integration.

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 Siggie Pokörn DNW
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International Program Committee

Christophe Hermans, DNW (chairman)

**Key dates and deadlines**

- | | |
|--------------------------|-------------------------------------|
| • 01 October 2014 | Abstract submission |
| • 01 January 2015 | Notification to authors |
| • 01 March 2015 | Final program and registration open |
| • 01 July 2015 | Full paper submission |
| • 07 - 11 September 2015 | CEAS 2015 Conference |

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A400M: THE VERSATILE AIRLIFTER FOR THE 21TH CENTURY

By Jean-Pierre Sanfourche (CEAS) in collaboration with Kieran Daly, Airbus Defence and Space

At a time when the flight tests of the A400M are progressing well and when the deliveries to the customers are taking place, the CEAS Board of Management has expressed the wish to see in the first Quarterly Bulletin of 2014 a dossier presenting in a synthesized manner a status report of this extremely important programme for the European Defence.



GENERAL CHARACTERISTICS

- **Crew:** 3 or 4 (2 pilots, 3rd optional, 1 loadmaster)
- **Capacity:** 37,000 kg:
 - 116 fully equipped troops/paratroops
 - Up to 66 stretchers accompanied by 25 medical personnel
- **Length:** 45,1 m
- **Wingspan:** 42,4m
- **Height:** 14,7 m
- **Empty weight:** 76,500 kg
- **Max. takeoff weight:** 122,000 kg
- **Fuel capacity:** 50,500 kg
- **Max. landing weight:** 122, 000 kg
- **Power plant:** 4 X Europrop TP400-D6 turboprop 8,250 kW each
- **Propellers:** 8 bladed, 5.3 m diameter

PERFORMANCE

- **Cruising speed:** 780 km/h (Mach 0.68 – 0.72)
- **Initial cruise altitude:**
 - At MTOW: 9,000 m
- **Range:** 3,298 km at maximum payload (long range cruise speed; reserves as per MIL-C-5011 A):
 - Range at 30-tonne payload: 4,540 km
 - Range at 20-tonne payload: 6,390 km
- **Ferry range:** 8,710 km
- **Service ceiling:** 11,300 m
- **Tactical takeoff distance:** 980 m (aircraft weight 100 tonnes, soft field, ISA, sea level)
- **Tactical landing distance:** 700 m
- **Turning radius (ground):** 28,6 m

THE A400M PROGRAMME HAS A LONG HISTORY

Already in the late 1980s, the European Armed Forces realised that they needed a new kind of airlifter, able to carry the necessary materials to the site of action, for military, humanitarian and other civic missions, with the capacity to fly into the rough, soft and short airstrips close to the theatre of operation, and also able to provide paratrooping as well as air-to-air refuelling. Furthermore it was obvious that the European Transall would reach the end of its service in the first years of the 21st century.

THE EUROPEAN STAFF REQUIREMENTS FOR A FUTURE TRANSPORT AIRCRAFT

So, the European Nations' Air Forces together with European industry launched feasibility studies in the early 1990s and produced a document called "joint European Staff Requirement". Then in March 1996, nine nations signed the "European Staff Requirement for a Future Transport Aircraft": Belgium, France, Germany, Italy, Luxemburg, Portugal, Spain, Turkey and the UK.

THE "FLA" PROPOSAL

Meanwhile a number of aircraft manufacturers had started working on a new military transport under the designation of "Future Large Aircraft" (FLA): Aerospatiale (France), DASA (Germany), British Aerospace (UK), CASA (Spain),

FLABEL (industries of Belgium and Luxemburg), Alenia (Italy), OGMA (Portugal), and the TAI (Turkey). An initial call for tender was launched by the European nations in 1998, to which the FLA grouping responded in 1999. In addition to the FLA proposal, other solutions were presented, including existing products and even aircraft developed in co-operation with non-West-Europe manufacturers. In July 2000, the FLA proposal was selected by the nations, with an initial commitment for 288 aircraft.

THE CREACTION OF OCCAR AND THE SIGNATURE OF A PRELIMINARY A400M CONTRACT FOR 197 AIRCRAFT ON 21st DECEMBER 2001.

In early 2001, the OCCAR (Organisation Conjointe de Coopération en matière d'Armements – Joint Co-operation Organisation for Armament) was created with six nations: France, Germany, Italy, UK, Belgium and Spain, in order to conduct collaborative projects more efficiently and more economically. On 21 December 2001, a preliminary contract was signed by OCCAR nations – without Italy which had in the meantime withdrawn from the launch nations group - for a total of 197 military aircraft, from then on named A400M instead of FLA.

FROM PRELIMINARY TO LAUNCH CONTRACT

On 27 MAY 2003, the Launch Contract was signed with OCCAR representing Belgium, France, Germany, Luxemburg, Spain, Turkey and the UK, for 180 aircraft. This was to be followed by an order for 4 aircraft by Malaysia in December 2005.

THE AMENDMENT OF 2011

Because of the shift in the programme, this contract was revised, leading to the signing on 7 April 2011 of an amendment which reduces from 180 to 170 the number of firm orders, the four from Malaysia remaining.

FROM AMSL TO AIRBUS MILITARY

The loose organisation which had managed the initial "FLA" was effectively integrated in May 2003 to become Airbus Military Sociedad Limitada (AMSL), a legal entity headquartered in Madrid, with Airbus, EADS, FLABEL and TAI as shareholders. In 2009, AMSL became part of the Military Transport Aircraft Division of EADS, also headquartered in Madrid. On 15 April 2009, MTAD and AMSL were regrouped in a single entity: AIRBUS MILITARY, a Business Unit of Airbus.

AIRBUS DEFENCE AND SPACE

As of 1st January 2014, Airbus Military is included in the new Division of Airbus Group, called AIRBUS DEFENCE and SPACE. This Division is formed by combining the business activities of Cassidian, Astrium, and precisely Airbus Military. It is to be noticed that this new entity is Europe's number one of Defence and Space enterprises, the second largest Space business worldwide and among the top ten of global Defence enterprises, employing about 40,000 persons and generating revenues of approximately Euro 14 bn per year.

A400M: A TECHNOLOGY LEADER IN THE 21ST CENTURY

The A400M features technical innovations in all areas: airframe structure and materials, aerodynamic design, propulsion, fly-by-wires controls and related advanced flight-deck.

AIRFRAME STRUCTURE AND MATERIALS

In order to reduce weight, the A400M intensively uses light composite materials: 30% of its structure is made of composites, which is more than on the A380. Parts of the structure which are made of composites include most of the wing, with, for the first time in history, its main spars made of that material. Also, nearly the entire tail – the horizontal and vertical stabilizers and the control surfaces – the rear cargo door, the undercarriage bays (sponsons) and the propeller blades (with Kevlar shells) are made of composite. The wing's 19 m-skin panels are the largest ever produced (*Figure 1*).

To fulfil its logistic role, the A400M offers a 340 m³ cargo hold. The diameter of the fuselage is close to that of the A330: the 4m x 4m cargo hold section permits the carriage of large military loads such as armoured infantry vehicles, combat helicopters, as well as outsized civil equipments necessary for humanitarian missions.

The technologies used enable the aircraft to land on short, soft and rough airstrips. This is facilitated by a 12-wheel main landing gear linked to an efficient shock-load absorber into the airframe structure.

The A400M is able to carry 30 tonnes over 3,943 km or 20 tonnes over 5,552 km (*Figure 2*).

AERODYNAMIC DESIGN

The designers have taken into account all the aerodynamic refinements allowing the aircraft to fly more smoothly and

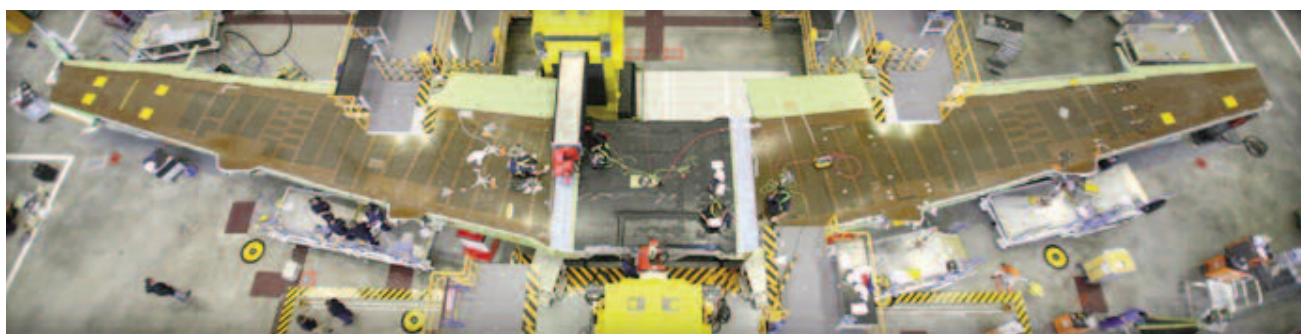


Figure 1. The wing's 19 m-skin panels.

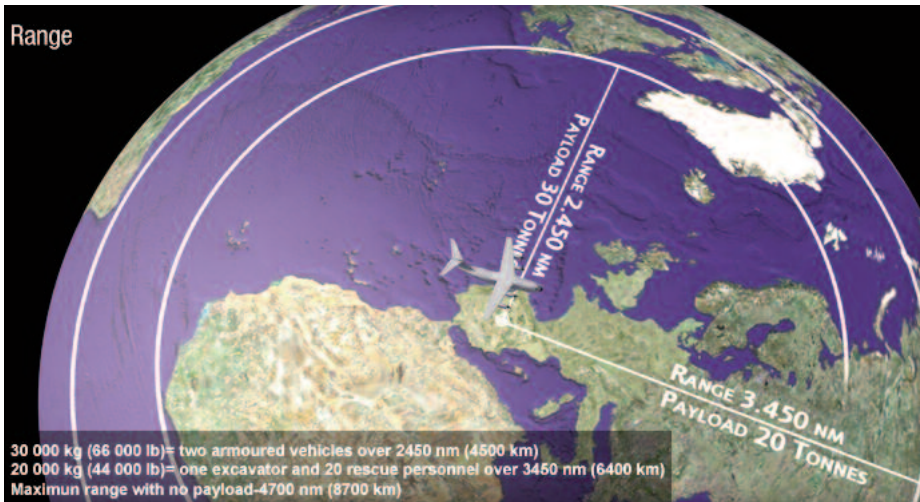


Figure 2

more efficiently. The sponsons have been shaped to reduce air turbulence aft of the ramp in such a way that paratroopers can jump simultaneously through the two dedicated side doors or through the ramp, without then running the risk of colliding with each other because of the air-flow behind the aircraft.

Extensive use of advanced 3D computational fluid dynamics tools optimized the wig shape, resulting in low drag design and thus a high speed cruise of Mach 0.72 without compromising low speed performance and landing.

PROPULSION: FOUR ENGINES TP400

One of the key elements to ensure the versatility of the A400M was the choice of the propulsion system. The 11,000 shp (Shaft Horse Power) TP400 developed by Europrop International (EPI), a consortium comprising Rolls-Royce, Snecma, MTU and ITP, is the most powerful turboprop engine ever built. Powered by four of these engines, the A400M can cruise at up to 37,000 feet altitude at speeds between Mach 0.68 and Mach 0.72. That will allow the aircraft to fly above turbulent weather conditions and to be integrated into the commercial aircraft airspace. At the other extremity of the speed/range envelope, the A400M is capable of flying at 110 kt up to 5,000 feet to refuel helicopters, or even lower to drop equipment and supplies.

The counter-rotating arrangement of the propellers, which turn in the opposite directions, allows a structural weight reduction. The arrangement preserves the symmetry of the aircraft when the 4 engines are operating, and reduces the adverse yaw in case of an engine failure, allowing in turn a reduction in the size of the tail by 17%, hence reducing weight and drag. Another advantage has been the possibility to improve by 4% the lift at low speed and so to simplify the slats, reducing by 8% the surface of the horizontal stabilizer (Figure 3).

COMPUTERIZED “FLY-BY-WIRE” FLIGHT CONTROLS

The computerized “fly-by-wire” flight controls which are used on the A400M are the same as those already used on other civil transport aircraft, starting a long time ago with the A320. The previous cables and pulleys by electrical wires linked to four independent flight control computers sending signals to actuators are replaced by these “fly-by-wire” systems, which not only reduces weight, but also



Figure 3. The down between the engines counter-rotation of the propellers, which turn in opposite directions, allows a structural weight reduction.

maintenance time, gives much greater accuracy to the commands, and permit the implementation of “flight envelope protection”. The flight envelope protection, by preventing the aircraft from stalling, allows the pilot to achieve optimum performance in a critical escape manoeuvre by simply pulling full stick back: it is a great contributor to the survivability of the aircraft in a hostile environment. The “fly-by-wire” system then manages the whole aircraft configuration accordingly without the pilot having to intervene further.

THE FLIGHT DECK

Thanks to fly-by-wire, the cumbersome central control column is replaced by light and easy to handle side-stick-controllers, providing the pilot with a free view to the large TV-like screens in front of them, while also allowing for a foldable table to be pulled out as needed. The A400M cockpit features 8 large interchangeable liquid crystal head-down displays: 6 of these – 3 for each pilot – are featuring primary flight displays, navigation displays, management or video, while 2 are dedicated to the systems moni-

toring. These FMS (Flight Management Systems) screens are controlled through alpha-numeric keyboards for simpler entering of data, and furthermore, 2 HUDs (Head Up Displays) are used as additional primary flight displays (Figure 4).



Figure 4. State-of-the-Art cockpit: the A400M features 2 HUDs which provide the pilots with all primary flight information together with flight director orders and flight guidance during critical mission phases; it also features 8 large interchangeable liquid crystal head-down displays.

ABOUT MAINTENANCE

The A400M has been designed to be extremely available. Its new maintenance concept; which is largely inspired from commercial civil airliner experience, translates into a very high dispatch reliability of 98.7% at entry into service. This will of course reduce costs. Over 12 years of operation, the mandatory heavy maintenance will require the A400M to be on ground for only 84 days. The other routine maintenance operations will be performed in the same way as for a commercial A320.

CONCLUSION

All the above mentioned features ensure to the A400M a number of basic qualities: survivability (Figure 5), high manoeuvrability, low level flight capability, steep descent and climb, damage tolerant flight controls, armoured cockpit, bullet-resistant windscreens, use of inert gas in the fuel tanks, segregated routing of hydraulics and wiring.

The A400M: a military transport aircraft very hard to find, very hard to hit, very hard to kill, and able to per-



Figure 5. The A400M has been designed for low detection possibility, low vulnerability and high survivability.

form various types of mission.

THE A400M: A MULTIMISSION AIRCRAFT

The A400M can perform missions which previously required two or more different types of aircraft.

PARATROOPER AND AERIAL DELIVERER

The A400M can accommodate up to 116 troops sitting face to face, alongside the fuselage and back-to-back along the centre line. This aircraft:

- Can carry the same number of fully equipped paratroopers with their chutes and related equipment.
- Can carry the paratroopers fast to where they are needed, and once over the location they can be dropped in short time over a limited area, allowing them to swiftly regroup and to be quickly operational: as a matter of fact, the low speed performance (110 kt) enables an easy exit, reduces the scattering of paratroops and thus permits easier regrouping on the ground (Figure 6). Two paratroopers can jump simultaneously (through the cargo door or through the two lateral doors), so reducing the jumping time and hence the scatter between the first and last to jump.
- Can drop forces from altitudes as high as 40,000 feet for special missions.
- Can safely retrieve and pull back into the cabin hung up paratroopers (with a winch).

Loads can be extracted through the ramp by gravity or with parachutes: it is possible to drop a single load of up to 4 tonnes by gravity or up to 16 tonnes with parachutes, or multiple loads combined weight of up to 25 tonnes.

Loads and paratroopers can be delivered in the same pass through the ramp. At altitudes up to 25,000 feet, manual delivery of light loads arranged in bundles can be performed using static lines or free fall techniques.

For very low level extraction (about 5 m) up to 3 individual



Figure 6. The A400M can accommodate up to 116 fully equipped paratroopers, carrying them to the DZ (Dropping Zone) at speeds up to 300 kt, but dropping them at as little as 110 kt to ensure minimum dispersion.

loads with a maximum payload weight of 19 tonnes can be extracted in a single flight pass, with parachutes which pull the material out of the aircraft.

A Computed Air Release Point (CARP) system linked to the automated load release system helps the loadmaster and crew to manage the extraction of the material. It is also integrated in the Head Up Display (HUD), allowing the crew to monitor the drop sequence.

CARGO CARRIER

The A400M fulfils the most varied requirements, both for military and “civic” missions around the globe. It is able to perform tactical missions while being also able to fly long-

range strategic/logistic sorties: it can carry up to 37 tonnes of cargo over a distance of 3,295 km, or when trading cargo for range, 30 tonnes over 4,500 km, or 20 tonnes of cargo a distance of 6,400 km, or any combination in between (Figure 7). These missions can be performed fast

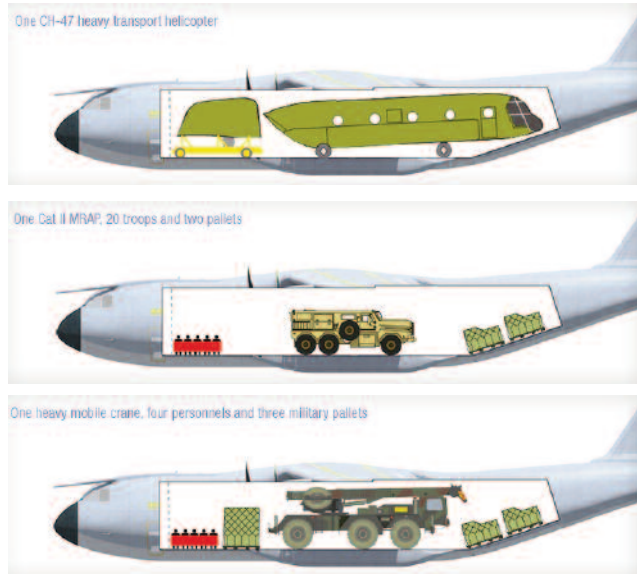


Figure 7. Combined strategic and tactical capabilities: heavy and outsized loads; the A400M can carry a heavy logistic truck, or a rescue boat, or one CH-47 heavy transport helicopter.

thanks to the Mach 0,72 cruise speed of the aircraft. Thanks to the inside dimensions of the fuselage, all sorts of large, outside cargo currently used for both military and humanitarian missions can be carried. Some examples: 1 NH 90 helicopter, or 2 Stryker Infantry Carrier Vehicles (ICV), or a rescue boat, or a large semi-articulated truck, or large lifting devices (such as excavators or mobile cranes urgently needed after a natural disaster). The A400M can carry a combination of these materials while offering up to 54 seats for troops, or search and rescue teams, medical support, engineers, etc. Thanks to its short landing characteristics, it can fly these items directly to the site of action, being able to land on, and take-off from, any short (750 m) (Figure 8), soft and rough unprepared airstrip, allowing swift humanitarian to arrive on the spot in the very short time-frame needed after a disaster. The A400M can also be easily transformed into a “casualty” evacuation airlifter carrying up to 125 stretchers and 7 medical supports with,



Figure 8. The A400M is able to land on and take-off from any short, soft and unprepared airstrip no longer than 750 m.

an option, an intensive care unit.

Fitted with on-board winches and crane, the cargo hold is optimised for single loadmaster operation from a computerised workstation, where the loadmaster can plan in



Figure 9. Autonomous ground operations: once the A400M on the ground, a rapid and autonomous cargo loading or unloading can be performed without any specialized ground support equipment.

advance loads from a load data base: so, the time on the ground is minimised, reducing the aircraft's vulnerability to hostile action (Figure 9).

Because of its low-speed characteristics, the A400M is the ideal tactical transport for dropping supplies from high altitude, assuring so a very rapid and direct response to any occurrence.

TANKER

The A400M can easily be converted into an aerial refuelling tanker: it takes 2 hours to convert the aircraft from an airlifter into a two-point tanker aircraft. The two refuelling pods under the wing can provide a fuel flow of up to 1,200 kg per minute. The refuelling can also be done through a center-line fuselage refuelling unit which provides a fuel flow of some 1,800 kg per minute.

The A400M carries up to 64,000 litres of fuel in its wings and centre wing box. Two additional cargo hold units can also be installed, providing an additional 7,200 litres of fuel each. Let's note that the fuel carried in the extra tanks can be of a different nature to the fuel in the main tanks, which enables to cater for the needs of different types of receiver aircraft. The A400M can do a 4-hour mission while off-loading about 35 tonnes of fuel. It can refuel the entire range of military aircraft (helicopters, fighters or large aircraft) at their preferred speeds and altitudes (Figure 10).

Of course the A400M can be itself refuelled through a nose probe mounted above the cockpit.

Conclusion: being able to combine both tactical and strategic/logistic missions, and also act as a tanker, it can perform the job of 3 different types of aircraft in one.

THE FLIGHT TESTS PROGRAMME

Five aircraft – MSN 1 to 4 + MSN 6 – logged some 3,700 flight hours to obtain civilian and military certification. The testing phase did not encounter any major difficulties, with the exception of some problems caused by the propeller TP400.

The test resources relied on two test centres - one in Toulouse, the other in Seville – and four telemetry stations set up in Madrid, Bremen, Filton and Hamburg. Three telemetry rooms were set up in Toulouse and two others in Seville while seven antennas were installed in France and Spain, complemented by a mobile ground station, connected to the facilities in Seville.

THE FIRST FLIGHT: 11 DECEMBER 2009 IN TOULOUSE

This first flight lasted 3 hours 45 minutes. The initial pace was good but difficulties occurred when reaching the planned level of progress, due exclusively to the bad weather, with a harsh winter in Seville as well as in Toulouse.

7 APRIL 2011: AMENDMENT TO THE OCCAR CONTRACT

This amendment led to a re-organisation, a new schedule and also a new terminology:

- IOC = initial Operational Clearance – this is the initial capability for logistic transport and medical evacuation (Medevac);
- SOC = Standard Operational Clearance.
- SOC 1 was obtained in October 2013, it includes a preliminary version of the self-protection system and also allows cargo/parachutist drop.
- SOC 1.5 will follow by mid - 2015, with in particular the initial capability for in-flight refuelling and cargo drop functions in the Flight Management System (FMS).
- The subsequent SOC schedule is under discussion with OCCAR.

THE MAY 2011 REPORT

In this report, Fernando Alonso, Airbus Flight Director, expressed his great satisfaction at this point. There had been 490 flights totaling 1,580 flight hours. The entirely satisfactory tests in cold weather and the verification of the correct performance of the aircraft during simulated in-flight refuelling behind a Vickers VC 10 of the RAF were mentioned. This initial assessment was immediately shared by all the flight test pilots, the EASA (European Aviation Safety Agency) and four government clients who had come to Seville for their first contact: English, French, German



Figure 10. The A400M is the only tanker which can refuel the entire range of probe-equipped military aircraft or helicopter at their preferred speeds and altitudes.

and Turkish.

MSN1: FINAL FLIGHT ON 4 NOVEMBER 2013

On 4 November 2013, development aircraft MSN1 – named “Grizzly 1” made its final flight, manned by exactly the same crew that first took it airborne from Seville on 11 December 2009 (Figure 11).

Nearly 4 years after its maiden flight, it has been retired and is to be placed on public display. MSN1 ultimately flew for 1,448 hours 25 minutes in 475 flights and its final mission was a one hour sortie to validate procedures for landing with the ramp and door failed in the open position.

After this mission, Chief Test Pilot Military Ed. Strongman, who commanded the first and last flight test said:

“Grizzly 1 has done superb service for Airbus Military and the customers who will benefit from everything we have learned. It was a great honour to fly it first at that historic day in 2009, and it is only fitting that the same crew should say goodbye to their old friend - Grizzly 1- today. We trust



Figure 11. The photo shows left to right: experimental test pilot Nacho Lombo, Chief Test Pilot Military Ed. Strongman, Test Flight Engineer Gérard Leskerpit, Head of A400M Flight Test Eric Isorce, senior Flight Test Engineer Didier Ronceray, and Senior Flight Test engineer Jean-Pierre Cottet.

that it will have many more years of productive service, educating the aviation public and inspiring a new generation to seek careers in aerospace.”

- MSN2

The first three aircraft were produced for the core certification programme, requiring extensive test instrumentation for measuring and recording aircraft and systems performance. As this activity winds down, only one of these three – MSN2 – which is fitted with the optimum instrumentation for performing the remaining work, is now required.

- MSN3

MSN3 nominally in storage but currently continues to fly.

- MSN4 and MSN6

MSN4 and MSN6 (Grizzly 4 and 5 respectively) will continue to support the flight test activities, henceforth concentrated on the further development of military capabilities, with their specific flight test instrumentation.

In order to provide the reader with a synthetic view about the flight test programme status, Jean-Pierre Sanfourche has interviewed José-Luis Lopez Diez, A400M Chief Engineer.

Q&A with A400M Chief Engineer José-Luis Lopez Diez

1. At this time of the flight test programme's development, could you briefly recall us the major difficulties which have been to be overcome in the different areas?

To our great satisfaction, the general behaviour of the aircraft and its performances are absolutely excellent in line with the specifications. From the very first flights, the pilots noted that the plane was pleasant to control. Since then, all pilots - our own or the crews of the customers - confirmed.

They adore its incredible handling and its functionalities. The major challenges which we encountered during the early flight test campaign, for example with the FADEC and FMS and in particular with the engines, are now behind us. The goal of in-flight tests consists precisely in discovering the points which need to be improved so as to make the plane robust for operation and this is what happened here. The aircraft obtained last year its certifications, civil and military, on the first contractual standard after some 300 hours of tests of functionality and reliability. These tests were carried out in record time, which shows the aircraft's technical maturity.

2. Are there any still remaining critical technical problems to be solved - or at least significant improvements still to be accomplished?

Today, the aircraft performs perfectly the logistic missions of the first contractual standard. We concentrate now on the development of the additional military capacities which are integrated gradually in the next months and years, while controlling the operational performance of the existing systems.

3. What are the major milestones of the flight test programme for 2014 and the following years?

We continue the intensive flight test programme according to plan. Our objective consists in developing and introducing gradually further capabilities. In this spirit, we accomplished flights at low altitude with night vision goggles, in-flight refueling and operations on unpaved runways. The tests of the systems of self-protection such as the alarm systems as well as counter measures are ongoing. And we devote much time to the air dropping of parachutists and of various loads to meet the needs defined by the customers. Perhaps the single biggest target this year is to demonstrate the various aerial delivery capabilities. This is an extremely important role for the aircraft in service. In the first part of 2014 we have demonstrated the dispatch of a range of loads from bundles airdropped from the side paratrooper doors to 4 tonnes loads delivered from the ramp. But there is a lot more to come including of course the dropping of large numbers of paratroopers.

4. What is your opinion concerning the duration and difficulty level of the transition towards the entry into effective military/humanitarian operations in the different

customer nations? Easy or not? Short or rather long?

We have been delighted to see the extraordinary speed with which the French Air Force began using the A400M in operations in Africa: less than six months after the official hand-over of their first aircraft! It is a mark of their confidence that they were prepared to use it in this way after such a short time. It was a combined military/humanitarian mission (using military assets for a fundamentally humanitarian goal) which is precisely the kind of role that was always envisaged for the A400M. So at this very early stage it's fair to say that we are encouraged by what we have seen.

5. What is your view regarding maintenance in the operational units during the exploitation era?

The maintenance concept for the A400M is following the Airbus Defence & Space strategy to offer state of the art services which allow the customer to concentrate on their core activities. With the major operators we are moving to a model based on industrial services and specifically spares availability, where the goal is simply to have the right spare in the right configuration available any time the Air Force needs it. The Air Force itself does not have to care about necessary provisioning quantities or configuration or alike. Naturally we and our customers expect to see the maintenance efforts higher in the early days but ultimately we are confident that we will drive it down to levels that will be truly ground-breaking in the defence world.

A400M ENTRY INTO SERVICE

CUSTOMER NATIONS PROGRAMME

see image 1

ENTRY INTO SERVICE FRANCE

see images 2, 3 and 4.

The first delivery to the French Air Force: 30 September 2013

More than 700 people celebrated the delivery of the first production A400M to the French Air Force at the Airbus military Final Assembly Line (FAL) in Seville on 30 September 2013 (Figure 12). This aircraft, the first of the 50 ordered by France, will be based at Orléans-Bricy Air Base and initially used for training before being deployed for operational missions.

The second delivery to the French Air Force: 13 November 2013

The 2nd A400M for the French Air Force which was delivered on 13 November 2013 was officially named "Ville de Toulouse" in a ceremony



1

at the Airbus delivery Centre in Toulouse, on 22 January 2014 (Figure 13).

ENTRY INTO SERVICE UK

see image 5

ENTRY INTO SERVICE TURKEY

see image 6

ABOUT THE COMMERCIAL PERSPECTIVES: A COMPETITIVE ENVIRONMENT

ORDERS AND DELIVERIES IN JANUARY 2014

- Total orders174
- Total deliveries2
- In operations2

The A400M will have to compete with many other military transport aircraft: - Alenia Aermachi C-27J – CN 235 and C295 (previously of CASA and now part of Airbus Military) – Lockheed Martin C-130J Hercules and its projected derivatives – Embraer KC-390 – Boeing C-17 - Russian – Indian MTA (successor of the Antonov An-22).



Figure 13. The second A400M delivered to France was officially named “Ville de Toulouse” in a ceremony which took place at the Airbus Delivery Centre (Toulouse) on 22 January 2014.

A400M Entry into service : France

A400M first customer: France signed a customized Support Contract in February 2013 for an initial period of 18 months. France is relying on two elements to achieve a successful service of its new A400M :

- ✓ **Training:** A training centre is under development in Orleans and will be managed by Airbus Military
- ✓ **Support:** Classical support, provided through the Launch Contracts will be complemented by Customised support.

A400M entry into service is a real challenge for our teams and we are now all ready to provide an outstanding performance.

AIRBUS MILITARY

A400M - France: Service and support

Classical support services- ILS (spares, tech support,...)

Customized support contract

Will be combined to offer a full service covering

Full in Service Support

- Fleet management
- Maintenance assistance & training
- Spares & repair supply chain operation
- Technical support

AIRBUS MILITARY

French AF support organisation

A fully integrated service covering all maintenance activities, provided to FAF through local subsidiary, and supported by all back-office specialists and MROS

FAF base in Orleans

LINE MAINTENANCE
Prop/Batt/Tyres shops

INTEGRATION of all services
Fleet Mgmt Support

AiM subsidiary in Orleans (~25 people)

- Local WH operation
- A/C Maintenance team + QEC Bay
- CSRs + Tech Eng.

AiM back office

- Order Desk
- Shipmt - Repair
- Suppliers Mgmt
- SIAe + Sar + Pablc MRO
- AMTAC + Design - OEMs

MAT. SUPPORT MAINTENANCE TECH. SUPPORT

AIRBUS MILITARY



Figure 12. 30 September 2013 in Seville: 1st A400M delivery ceremony. On the photo the following personalities can be seen: HRH Prince of Asturias, French Minister of Defence Jean-Yves Le Drian, Spanish Defence Minister Pedro Morenas.

A400M Entry into service: UK

TMB13

UK

ROYAL AIRFORCE

A400M

Support:

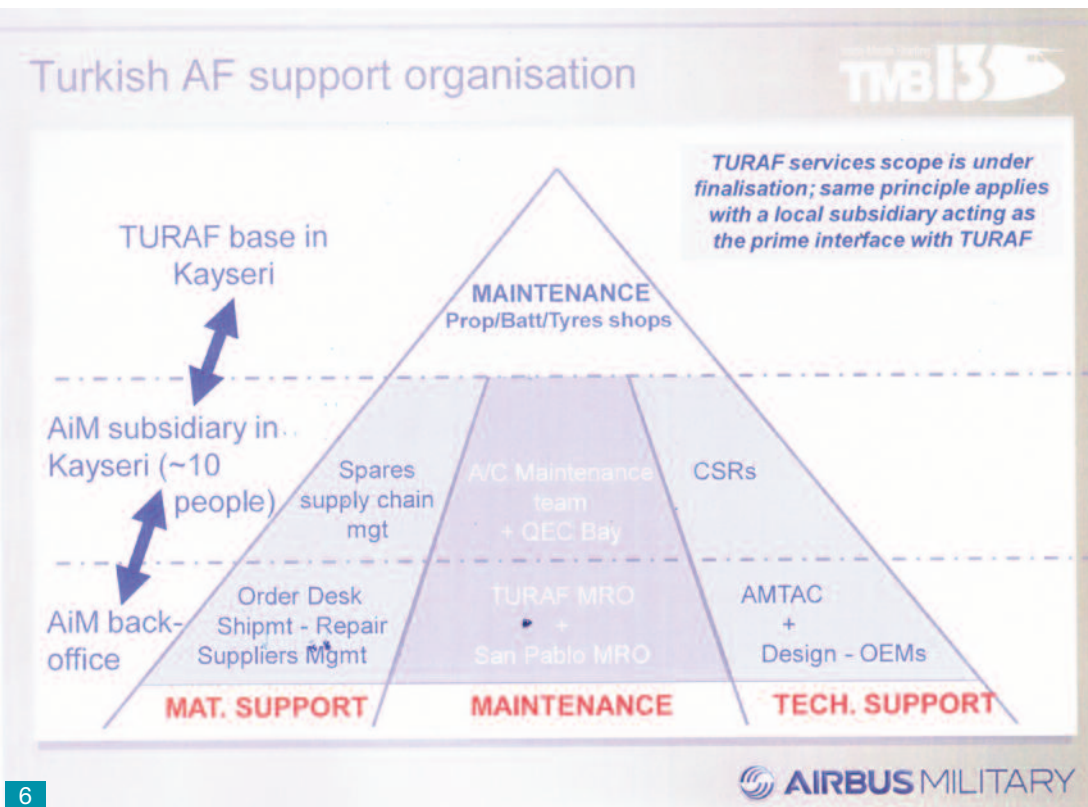
- Airbus Military is currently negotiating with both UK & FR a joint customised support-contract to offer a full service to support A400M

Training:

- UK training contract was signed in February 2013, covering a full installation and operation of UK training centre in Brize Norton by Airbus Military and Thales

5

AIRBUS MILITARY



JEAN-PIERRE SANFOURCHE HAS INTERVIEWED MR JAN PIE, SECRETARY GENERAL OF ASD



Jean-Pierre Sanfourche - Could you relate in a few words the general judgement about the ASD Convention which was held in Prague from 22 to 25 April? What are the most important messages which emerged from the presentations and debates?

Jan Pie - I am happy to report that the feedback we are getting from the ASD community is uniformly positive. This year's Convention proposed a different, more interactive formula of debates which addressed the 4 ASD sectors with the purpose of taking stock, together with the representatives of the EU Institutions, Agencies and national governments, of our collective achievements of the past five years, and reflect on the ways to further improve our cooperation after the European elections.

Concerning the "domestic" situation, the debates cumulated in a critical overview of the EU industrial policies. There is a need for continuity and clear targets: our industry's long-term future must not be jeopardised through inadequate IPR regulations; standardisation should be envisaged through the scope of EU exports; in RTD programmes, we should be on an equal footing with our competitors; as regards Security in particular, the EU should go beyond the mere scope of research to embrace the full dimension of the market and accompany it with adequate policies. Space-based services for EU public policies and citizens should be given proper attention, as they are a strong source of growth and jobs.

As regards global cooperation, we recognised the urgent need for our industry to be adequately represented in ICAO, which is the only place where truly global positions on the essential aspects of aviation can be developed.

J.-P. S. - Since you have taken up your duties as Secretary General last September, have you identified any needs to introduce some changes in the organisation and in the operation procedures of ASD?

J. Pie - As any newly appointed Secretary General, I too arrived with plans of change and renewal. I was lucky to find a team who welcomed my ideas and joined forces with me to bring them to fruition. We have restructured the Association in order to give prominence to the 4 Sector Business Units (Aviation, Defence, Security and Space), which will be interwoven by the expertise of 6 transversal

Commissions (R&T; Services; Supply Chain; Environment; Economic, Legal and Trade; External Affairs). Internal ASD strategy is being developed to ensure a continued and inclusive flow of activity and information between these entities, with excellence as the final goal. Furthermore, a thorough renewal process of their Chairmen, Vice-Chairs and membership has been set in motion, with high-level competence as the main criterion of appointment.

J.-P. S. -Do you plan a staff increase or do you estimate that the present strength is sufficient?

J. Pie - ASD is in the process of recruiting its Directors who will lead the Aviation and Defence & Security Business Units respectively. These are the most important additions to the team for the moment. The rest of the people now working at ASD have been reassigned to positions which reflect the new structure of the Association. With the possible recruitment of one additional Director in future, I believe the current headcount is optimal for achieving the goals of ASD.

J.-P. S. - Among the biggest issues for European aerospace, there is the building up of an increasingly integrated European Defence. The first Summit of Heads of State and Government dedicated to a comprehensive review of Defence and Security issues was held in December. How do you see the decisive role ASD could play with a view to activating the movement in the wake of this fundamental event?

J. Pie - Having contributed significantly to the EC preparatory work in the run up to the December European Council on Defence, ASD welcomed the Roadmaps that the Heads of State addressed to the EU institutions. Through action at political level the momentum was kept to ensure that strategic debate was taken further.

In the frame of the Preparatory Action in CDSP - related research, ASD has already engaged in a structured dialogue with the European Commission, focussing on the future role of the EC in Defence R&T and avoidance of duplication with NATO. This dialogue will extend to the implementation of all Council conclusions with R&T dimension, ready for a review by the Council in June 2015. Discussions also continue with the reorganised EDA, whose mandate from the European Council includes 4 capability development initiatives.

J.-P. S. - What is attitude of ASD regarding the negotiations of a transatlantic Free-Trade Agreement in the sector of aerospace?

J. Pie - ASD has been closely monitoring the negotiations since the start and has contributed its views to the EC consultation on the draft negotiating mandate last year. However, the 4 ASD sectors command very different markets, so each reacts differently to the prospect of a Transatlantic Trade and Investment Partnership. Aeronautics, with the EU-US BASA functioning to the satisfaction of both Parties, is not directly involved; The Space sector has concerns about services: launch and earth observation services already have long-term contracts in the US; any further opening of the Space institutional markets might create imbalances and should be based on a careful impact assessment regarding the industry as well as Europe's independence; Galileo however should be excluded (the GPS is). Defence and Security are excluded from the WTO Government Procurement Agreement (GPA) and from all other trade agreements to which the EU is a party. Given their specificity, and taking into consideration the principles and purpose of the existing EU legislation on Defence procurement, ASD fought hard for, and won, their exclusion from the TTIP.

On top of this there remain a number of transversal issues that can affect our industry, such as rules on public procurement or ISDS. That is why we remain vigilant in order to intervene, together with similar organisations in Brussels, should the negotiations take the wrong turn.

J.-P. S. - What role ASD could play for facilitating the completion of Galileo in the best possible conditions?

J. Pie - As a rule, most of the very specific Space-related work is being done by EUROSPACE, which is affiliated to ASD. But whenever help of the entire ASD community is needed to fight for Space-related issues, we go ahead and do it. This may include the 2nd generation Galileo and the evolution of its mission. We share with EUROSPACE the sense of urgency as regards the preparation of the 2nd generation Galileo and think that Horizon 2020 should contribute to it.

J.-P. S. - To attract the most brilliant scientific students in the aerospace career is presently an important challenge: has ASD established a plan of action as regards this subject?

J. Pie - As our Statutes say, the first and foremost purpose of ASD is to promote and support the competitive development of the sectors it represents. Without mentioning it in name, this of course includes the important issue of the renewal of aerospace workforce.

Taking into account the spread and legislative focus of our activities, it is at ASD's more important events, such as conventions or international conferences we occasionally organise in cooperation with similar organisations, that a large place is reserved to skills and young people. While in the previous years we facilitated the dialogue between educational establishments and industry in an effort to promote aerospace careers, this year in Prague we dedicated a whole first day of our convention to young professionals themselves. They were given the opportunity to confront their ideas with those of the representatives from the leading aerospace companies in Europe. We will certainly repeat and extend this action in future.

J.-P. S. – In order to conclude our interview, may I ask you to express the ten top level priorities you assign to ASD for the coming months?

J. Pie – My top priorities are the following:

1. Complete the development of ASD and the renewal of its main working bodies.
2. Establish relations of trust and cooperation with the new teams at the helm of the European Commission and Parliament.
3. Deploy the necessary efforts in order that a Sky and Space Intergroup, a platform for All-Party Aerospace debate, is created again in the new European Parliament.
4. Ensure that Flightpath 2050, the main strategy document of European Aerospace, reconquers the priority status in the mindset of the new EU teams.
5. Engage in an intensive preparatory action for the future CDSP Research.
6. Identify, in line with our members' interests, the specific areas of Security where we should maintain the highest level of core competence, maintaining ASD's role as a leading EC interlocutor and collaborator in the drafting of Security-related policies.
7. Strengthen the relationship of cooperation and coordination with EOS, the European Organisation for Security.
8. Contribute comments to the EC consultation on Investor-to-State Dispute Settlement (ISDS) within the TTIP.
9. Undertake strong lobby activity in Brussels and in the national capitals in order to secure an appropriate budget for EASA, commensurate with the Agency's ever increasing responsibilities.
10. Respond to the EC consultation on the review of the "Europe 2020 Strategy".

ASD SECRETARIAT



Strategically located in the heart of Brussels, the Secretariat of the association is responsible for major items of policy work, and for creating and maintaining close links with the European Institutions and international organisations.

Mr **Jan Pie** was appointed to the position of Secretary General of ASD in September 2013. With extensive experience in complex civil security, Public-Private Partnership crisis management operations, he brings a fresh perspective to the Association. Before joining ASD, Jan Pie was Secretary General of the Swedish Security and Defence Association (SOFF) where he successfully developed the organisation into a trusted and important strategic partner of Swedish and Nordic Public

Institutions, as well as being a driving force within the industrial community. He also chaired the steering committee for the Swedish MoU office in Washington. Previously, he had held the position of Vice President and Emergency Preparedness Director at the SOS Alarm Group in Sweden. He had also held several leading positions in business and industry. Jan Pie holds IFL Executive Management degree from the Stockholm School of Economics and an IHM Masters from the IHM Business School in Gothenburg.

NEW HORIZONS IN AVIATION

Interview with Naresh Kumar, Chairman of ACARE's Communication Group of ASD

Jean-Pierre Sanfourche – Launched in 2001, ACARE has already come a long way. Can you tell us under what circumstances this advisory council was created?

Dr Naresh Kumar – The aviation community realised in the nineteen nineties that the anticipated increase in aviation traffic could not be supported by the world's existing systems, particularly in Europe without profound and unacceptable penalties. Social change and familiarity, as well as the increase in traffic, meant that protests would become louder – not just against noise and pollution, but also about delays, unreliable schedules, crowded facilities, congestion and inconvenience. These issues presented fundamental challenges that would not yield to incremental and steady progression but would need an urgent, ambitious and more holistic approach. So, in 2000 Commissioner Philippe Busquin contributed significantly by inviting a Group of Personalities to set out an ambitious vision for the future of aeronautics over the medium to long-term. This group produced a report, entitled "European Aeronautics – a Vision for 2020". Published in January 2001 it recommended the formation of an Advisory Council to create a Strategic Research Agenda (SRA) that would enrol all those with a stake in the future of aeronautics to collaborate in exploring and advancing the technologies that will lead to the realisation of the goals of Vision 2020. ACARE was launched at the Paris Air Show in June 2001 and attracted over 40 member organisations and associations including representation from the Member States, the European Commission and other stakeholders including: manufacturing industry, airlines, airports, service providers, regulators, research establishments and academia.

J.-P. S. – Right! Now we know why ACARE was created can you please drive us through its work over the last decade?

Dr N.K. – ACARE was originally formed with two top-level objectives for European aeronautics: to meet society's needs and achieve global leadership in aviation for Europe. The publication of its first Strategic Research Agenda in October 2002 was also the first time that a proposal on this scale had been attempted in Europe and the reality that the changes that were needed would be impossible without new technologies in new applications. It also pointed the way toward actions in other fields where equally important changes were needed; in public policy, in regulation, and in areas of international co-operation. This was an important early success!

Subsequent editions of the Agenda described a set of technical activities that were essential to sustain and extend the industry of air transport, widening the range of situations, identifying a number of scenarios and concrete recommendations for future research and innovation.

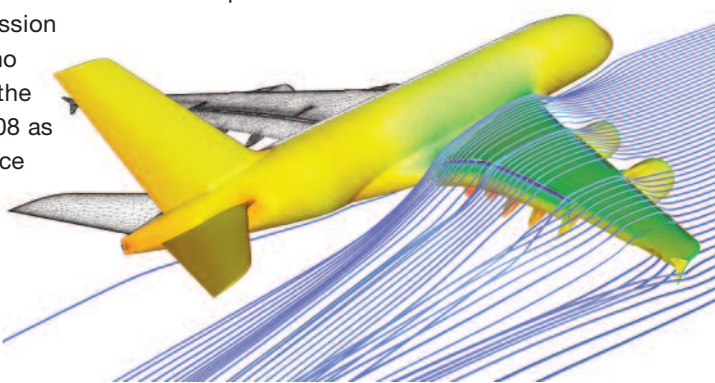
J.-P. S. – We assume that all concerned stakeholders make a significant contribution. Can you give us some concrete examples?

Dr N.K. - Substantial results have been achieved since the formation of ACARE with hundreds of wide ranging projects conducted in Aeronautics and Air Transport across the European community. To list them all here would take a long time and that is why I invite you to read the brochure "Success Stories and benefits beyond aviation". You will see that the examples of research projects that have been completed are categorised in support of the key challenges which are: Quality and Affordability, Environment, Efficiency of the Transport System, Safety and Security. What I would like to add is that ACARE played – and still does – a pivotal role in providing strategic advice to the European Commission's Aviation Platform, which include the following fields of actions: accelerating the Single

European Sky (SES), strengthening the competitiveness of the European industry by expanding the market to a common aviation area with the neighbouring countries, determining and planning priorities for future air transport policy initiatives, analysing challenges and solving problems to ensure the development of the sector, and identifying bottlenecks and proposing steps to complete the single market for aviation.

J.-P. S. – Let’s talk about Flightpath 2050. Why was it important for the new ACARE organisation to involve airlines and airports?

Dr N.K. – Although significant initiatives were underway namely, “Clean Sky”, an ambitious research project with demonstrators, to improve the impact of aviation on the environment, and “SESAR”, to develop and deploy the future Air Traffic Management system at a pan European level a number of things had changed in the market place. The international scientific community clearly pointed to the need to urgently act to combat climate change. A consequence was the introduction of air transport in the European Union’s Emission Trading Scheme and who could have predicted the economic downturn in 2008 as well as the rise in oil price and the implications for our industry? There was no doubt that a new vision of air transport stretching beyond the 2020 horizon was needed. This prompted the sector to set new, more challenging goals and respond to the future needs of Europe and its citizens over a longer timeframe and this new vision, Flightpath 2050, was developed by the High Level Group on Aviation Research under the leadership of the European Commission and published in 2011. It underlined the need for further emissions reductions, recommended maintaining and extending Europe’s leadership, improving safety and security as air transport needs grow as well as developing excellent research infrastructure and education for the sector. In response to the recommendations of Flightpath 2050 a new ACARE organisation with new membership was put in place. ACARE stakeholders came together to develop the Strategic Research and Innovation Agenda (SRIA), that would enable the aims of the new vision to be achieved.



The new goals for aviation are wider and even more challenging than those originally set for 2020. They include such aims as “90 per cent of travellers within Europe able to complete their journey, door to door, within 4 hours” and “Air Traffic Management to be able to handle 25 million flights per year” [compared to around 10 million today]. These significant challenges can only be achieved successfully, and in a cost effective way with the full support of European Airlines and Airports.

J.-P. S. – What happens next?

Dr N.K. – Aviation today provides close to nine million skilled jobs, directly and indirectly, and contributes 600 billion Euros to Europe’s Gross Domestic Product. Home to some 450 airlines and over 700 airports, European aviation plays a key role in serving society’s needs for safe, secure and sustainable mobility – in Europe and all over the world. Continued growth in European demand for air transport is anticipated for the foreseeable future. More than ever, sustainable mobility is at stake and it is essential that travel

become even safer, secure, reliable, affordable and environmentally responsible.

Competition is fierce and increasing, not only from established regions but also from new, strong challengers and regulatory and taxation environments within and outside Europe have not yet

fully converged and so do not yet provide a global level playing field. Maintaining global leadership for aviation in Europe and meeting the needs of citizens are thus the top level objectives that are addressed by ‘Flightpath 2050. Their transposition into a Strategic Research and Innovation Agenda (SRIA) provides a pathway to deliver that vision.

The task now for ACARE is to stimulate the implementation of the SRIA - through the excellent European research and innovation capabilities, delivering measurable benefits in phases to 2020, 2035 and 2050. As in the past progress will be monitored and reviewed so that adjustments can be made where required as changes occur in the market place and society’s expectations develop further and of course, as discoveries from research emerge.



More information on www.acare4europe.org

GALILEO

7 May 2014: the first two Galileo Full Operational Capability (FOC) satellites arrived at the S1A clean room at Guyana Space Centre, in preparation for launch by Soyuz this summer.

Named 'Doresa' and 'Milena', these two satellites are in the course of the launch campaign. Manufactured by OHB in Bremen, with navigation payloads contributed by Surrey Satellite Technology Ltd. in Guilford, UK, they had spent several months at ESA/ESTEC in Noordwijk (NL) where they had undergone exhaustive testing in simulated space conditions. "Thanks to the good collaboration between the participating industrial teams and the experts at the ESA as our customer, OHB was able to successfully finish the Flight Readiness Review", said OHB's Director of Navigation Wolfgang Paetsch who will be personally over-

seeing the launch preparations in Kourou.

The definition, development and in-orbit validation phases of the Galileo programme were carried out by ESA and co-funded by ESA and the EU. The Full Operational Capability phase is managed and fully funded by the European Commission. The EC and ESA have signed a delegation agreement by which ESA acts as design and procurement agent on behalf of the EC. OHB System is the industrial prime contractor responsible for the total of 22 Galileo FOC satellites.



The two FOC satellites 'Doresa' and 'Milena' resting side by side in the S1A clean room

SESAR

FLORIAN GUILLERMET IS THE NEW EXECUTIVE DIRECTOR OF THE SESAR JOINT UNDERTAKING (SJU)

On 1 April 2014, Florian Guillermet took up his new role as Executive Director of SESAR JU.

BOOSTING THE DELIVERY OF PERFORMANCE-DRIVEN ATM SOLUTIONS

By Florian Guillermet

On 1 April 2014, I proudly took up the role of Executive Director and have already started to bring my skills and expertise to bear as I drive the next stage of the programme forward.

The SESAR Research and Innovation story so far

In stepping into this new role, I obviously couldn't help but reflect on the incredible journey that the SESAR partnership has travelled since 2008. Aviation is a fast moving mode of transport, and yet I don't need to tell you that change in ATM happens at a much slower pace. Nevertheless, in a relatively short space of time, the SESAR members have succeeded in clearly defining a comprehensive ATM research programme and building a robust and effective sector-wide partnership. Since then, high-perfor-

mance solutions are being made available for deployment in response to the sector's needs. These solutions are now shared through the SESAR website, with the necessary operational and technical information (the "solution packs") which I am confident will help to accelerate their early deployment.

Meeting our mandate

So the SESAR Research & Innovation partnership is clearly meeting its mandate - having established the technological pillar of the Single European Sky initiative - to modernise Europe's ATM system; it is now recognised as a core element in the value chain for a more efficient and competitive European aviation industry. Looking beyond the European context, SESAR's successful method of working has been one of the sources of inspiration for the creation of a new global approach to ATM modernisation, as reflected in the Global Air Navigation Plan by the International Civil Aviation Organisation (ICAO). But we are only mid-way; the

job is far from over. In the coming three years, our partnership must achieve its commitment to deliver the on-going SESAR programme ready for industrialisation and subsequent deployment. Time is therefore of the essence, as Europe needs, now more than ever, an efficient air transport system. Our customers and stakeholders demand both an increased rate of delivery and a greater focus on delivering deployable results that once in place will really make the difference in terms of benefits. Yet to have lasting change, we must have a much longer-term outlook of our work. That is why in the current programme we have established the means of connecting exploratory research to development and pre-industrial activities. This provides the ability to address both immediate, as well as long term societal and market challenges, as identified in the Strategic Research and Innovation Agenda (SRIA) for aviation in Europe. And while the SESAR Joint Undertaking and the Programme are time-bound vehicles, I strongly believe that we must continue to have a vision which is bigger and bolder than the confines of time itself.

2020 vision: performance-driven research and innovation

SESAR 2020 clearly articulates this performance and deployment-orientated approach but also a more flexible view of ATM research; it takes into account, changing markets, operating and legislative environments and the need for continuous and coordinated investment. To enable more efficient and resilient ATM operations, as well as to make swifter progress towards deployment, the Programme 2020 will focus research and innovation work on key components that have clear performance benefits and that will result overall in a leaner ATM system architecture. Deployment viability, and in particular enabling the transition to deployment, will also be facilitated within the Programme 2020 through very large-scale demonstrations and a strong coordination with the future Deployment Manager.

Enriching the partnership

Within the overarching framework of the European ATM Master Plan, work has already started on the content and structure of the SESAR Research & Innovation Programme

2020. It will be presented in June to the SJU Administrative Board, in order to launch a call for expression of interest, the first step in the renewed SESAR partnership. All going to plan, the core programme activities will be ready to launch by July 2015, which will ensure a ramping-up of the new projects while phasing out the current programme. In doing this, we will build on our experience, leveraging the capabilities of our current and future members and partners, involving end users and coordinating with all stakeholders. We also review where necessary our way of working to further improve our efficiency and increase our impact. Ultimately, I believe that this intense work will enable us to further focus and prioritise our activities, generating a continuous pipeline from innovation to deployment.

Picking up the pace

Let's not be complacent, though as these are challenging but exciting times for the SJU and the SESAR Programme. I firmly believe that the ATM system is a key element and influential factor in the air transport value chain and our reputation, along with the European aviation industry and the airspace user competitiveness, is at stake with the challenge for its rationalisation and modernisation, through SES and SESAR. I am eager to face these challenges and bring my applied understanding of the aviation business, deeply rooted customer focus and result-oriented attitude to focus, in order to pick up the pace and deliver performance-driven solutions for the next generation of European ATM system. I trust that you will join me and the SJU team on this challenging journey and commit with us to deliver this next phase of SESAR and of the SESAR Joint Undertaking.

EUROPEAN PARLIAMENT VOTED IN FAVOUR OF SESAR EXTENSION

The European Parliament has voted almost unanimously in favour of the extension the Single European Sky Air traffic management Research (SESAR) Joint Undertaking (JU) until 2024. The EU Council of Ministers is expected to adopt the final act by summer 2014. ►

EXECUTIVE DIRECTOR



"SESAR is Europe's most ambitious research and development programme and I am extremely honoured to have been chosen to steer the programme"

Florian Guillermet is an engineer, graduated from Ecole Polytechnique and the Civil Aviation Engineering School in France; he also holds a Master degree in aeronautics and airport management. Florian has been working in the field of Civil Aviation for 15 years. He started his career in the flight planning department of Air France. He then held different managerial positions at the French Air Navigation Service Provider before joining the European Central Flow Management Unit at Eurocontrol. He has been in charge of various operational and IT projects. His experience ranges from

ATM systems definition and implementation to network operations management. He joined the SESAR Joint Undertaking in June 2008 as Chief Programme Officer and is responsible for the definition and execution of the SESAR Programme. Florian was appointed Deputy Executive Director Operations and Programme in January 2012. And on 1 April 2014 he was appointed Executive Director.

► THE 2014 SESAR AWARD WINNERS

Three projects are the winners of the 2014 SESAR Awards:

- Development of an ADS-B Performance Evaluation Framework
- Development of Airport Safety Support Tools

- Development of Passenger- Oriented Enhanced Metrics (POEM).

The winners were announced on 3 March 2014 on the occasion of the World ATM Congress in Madrid.

CLEAN SKY 2 IS READY TO FLY

The Council of the European Union agreed to extend the Clean Sky Joint Technology Initiative (JTI) within the EU Horizon 2020 Framework Programme at its meeting yesterday. Clean Sky 2 will involve investing nearly €4 bn in breakthrough aviation technology research. The EU will invest €1.75 bn in the Clean Sky 2 under Horizon 2020 building on its investment of €0.8 bn to date under the Seventh Framework Programme. Participants will contribute approximately €2.2 bn to Clean Sky 2 bringing the total investment effort close to a total of 4 bn€. This will enable CO₂, NO_x and noise emissions to be reduced by at least 20 to 30 % compared to the current state-of-the-art: meeting society's needs and increasing the global competitiveness of the aeronautics industry in Europe and its supply chain.

Clean Sky 2 research will run until 2024 and will culminate in major integration, demonstration and validation activities. The new programme will be the EU's centrepiece aeronautics research programme and will be leveraged by further research activities funded at national and regional level and by large private investments. Clean Sky 2 will be a major enabler to fully realise the ambitious environmental targets set by the Advisory Council for Aeronautics Research in Europe (ACARE) for 2020, to which the current Clean Sky initiative is already strongly contributing.

By endorsing Clean Sky 2 the Council of the European Union has given the green light to the next generation of innovative aircraft which will deliver on the challenges faced in mobility, environment and competitiveness.

Eric Dautriat, Executive Director of the Clean Sky Joint Undertaking, commented: "Based on the successful Clean Sky experience to date, Clean Sky 2 is well positioned to become a force in shaping innovation for aviation in the decade to come. The entire aeronautics supply chain will benefit: SMEs, research organisations, universities and industry".

Ensuring a continuation of the Clean Sky JTI with Clean Sky 2 will enable Europe to:

- Accelerate the development of smart, environmentally and energy efficient aircraft that operate worldwide and thereby meet environmental and societal targets for a more efficient, safer and more environmentally friendly air transport;
- Achieve its strategic social priorities with sustainable growth, creation of wealth and stable employment in fields of high technology.
- Win global leadership for European aeronautics with a competitive supply chain, including academia, research and SMEs.

COPERNICUS

ON 3 APRIL 2014, EUROPE LOFTED FIRST COPERNICUS ENVIRONMENTAL SATELLITE, THE ESA'S 'SENTINEL-1A' SATELLITE



The 2.3 tonne satellite 'Sentinel-1A' lifted off on a Soyuz rocket from Guiana Space Centre at 21:02 GMT on 3 April. The first stage separated 118 seconds later, followed by the fairing (209 sec), stage 2 (287 sec) and the upper assembly (526 sec). After a 617 sec burn, the Fregat upper

stage delivered Sentinel -1A into a synchronous orbit at 693 km altitude. Equipped with a powerful synthetic aperture radar (SAR), Sentinel-1A is ensuring continuity with the Envisat satellite which stopped working after 10 years of service. The SAR technology is based on a long heritage of Radar satellites, starting with ERS-1 23 years ago.

With this launch, the Copernicus is now moving in its operational phase. This mission is the first of six families of dedicated missions that will make up the core of Europe's Copernicus Environmental Monitoring Network. Copernicus will provide operational information on the world's land surfaces, oceans, and atmosphere to support environmental and security policy making as well as the needs of individual citizens and service providers. Copernicus opens a new era in Earth observation with continuous monitoring and continuous improvement.

YEAR 2014: JULY – DECEMBER

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

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

28-30 July • **AIAA** – AIAA Propulsion and Energy 2014: 50th AIAA/ASME/SAE/ASEE Joint Propulsion Conference and 12th International Energy Conversion Engineering Conference – Cleveland, OH – www.aiaa.org/

02-10 August • **COSPAR** – COSPAR 2014 – Moscow – State University – www.cospar-assembly.org/ -
<http://cospar2014moscow.com/>

04-07 August • **AIAA** – AIAA Space Conference – San Diego, CA – www.aiaa.org/

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

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

23-25 September • **RAeS/IPTC** – International Flight Crew Training Conference – London –
www.aerosociety.com/events/

24-26 September • **3AF** – IES 2014 – European Forum on Economical Intelligence - Troyes, France – www.ies2014.net

29 Sept.-03 October • **IAF** – 65th International Astronautical Congress – Toronto (Canada) – www.iafastro.org –
<http://www.iaf2014.org/>

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

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

21-23 October • **ICAO** – Innovation in Aviation Security Conference – Montréal – <http://www.icao.int/Meetings/SIAS/>

27-29 October • **EASN** – 4th EASN Workshop Flight Physics and Aircraft Design – Aachen, Germany –
<http://www.easn.net/workshops/>

03-05 November • **RaeS** – Aircraft Research Operations – London – www.aerosociety.com/events/

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

04-05 November • **DGLR/ACARE/CEAS** – European Aviation Technology Convention (EATC) : “Europe’s Future in
Aeronautics and Air Transport” – Berlin-Adlershof, Germany – www.dglr.de

04-06 November • **UAE** – Helishow Dubai 2014 – <http://www.dubaihelishow.com>

05-08 November • **Indo Defence Expo** – Jakarta, Indonesia – <http://www.indodefence.com/>

11-13 November • **FSF** – IASS 2014 – International Air Safety Summit – Abu Dhabi, UAE –
<http://www.flightsafety.org/aviation-saf>

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

08-10 December • **MEBAA** – MEBA 2014 – Air Show Business Aviation – Dubai, UAE – <http://www.meba/aero/>

YEAR 2015

05-09 January • **AIAA** – SCITECH 2015 – AIAA Science and Technology Forum and Exposition 2015 – Featuring: 23rd AIAA/ASME/AHS Adaptive Structures Conference – 53rd AIAA Aerospace Sciences Meeting – Atmospheric Flight Mechanics – Infotech@Aerospace – Spacecraft Structures – GNC – Modeling and Simulation – 17th AIAA Non-Deterministic Approaches – 56th AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics and Materials Conference – 8th Symposium on Space Resource Utilization – 33rd ASME Wind Energy Symposium – Location: Kissimmee, FL – www.aiaa.org/

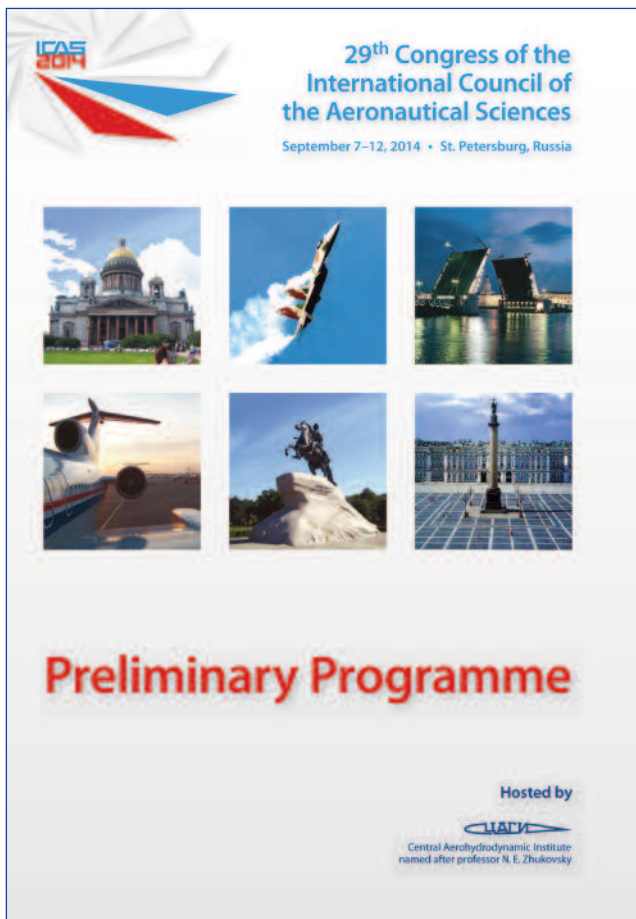
11-15 January • **25th AAS/AIAA Space Flight Mechanics Meeting** – Williamsburg, VA – <http://space-flight.org/> www.aiaa.org/

26-29 January • **AIAA** – 61st Annual reliability & Maintainability Conference – RAMS 2015 – Palm Harbor, FL – www.rams.org www.aiaa.org/

07-14 March • **AIAA** – IEEE Aerospace Conference – BiD Sky, MT – www.aeroconf.org

30 March – 02 April • **AIAA** – 23rd AIAA Aerodynamic decelerator Systems Technology Conference and Seminar – Daytona Beach, FL – www.aiaa.org/


13-15 April • **CEAS** – EuroGNC 2015 – 3rd CEAS Specialist Conference on Guidance, Navigation and Control (GNC) – Toulouse (France) – www.onera.fr/eurognc2015 -



ICAS 2014


29th Congress of the International Council of the Aeronautical Sciences

September 7–12, 2014 • St. Petersburg, Russia



Preliminary Programme

Hosted by



Central Aerohydrodynamic Institute
named after professor N. E. Zhukovskiy



CALL FOR PAPERS



40th EUROPEAN ROTORCRAFT FORUM 2014

2-5 September, Southampton, UK

www.erf2014.com



ERF European Rotorcraft Forum

CEAS

ROYAL AERONAUTICAL SOCIETY

THE CEAS/ASD AEROSPACE EVENTS CALENDAR

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

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

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

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

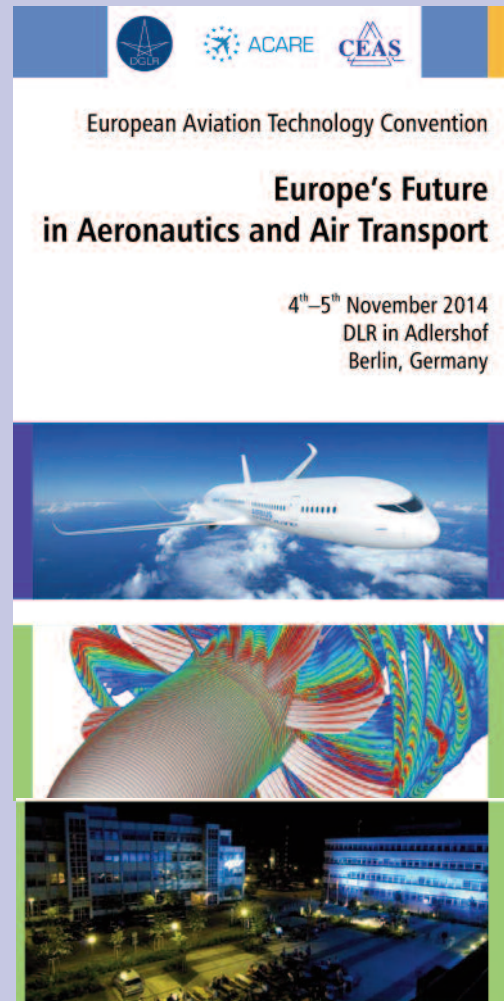
AUTOMATIC INSERTION OF NEW EVENTS BY THE ORGANISERS THEMSELVES:

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

CONTACTS:

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

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



European Aviation Technology Convention

Europe's Future in Aeronautics and Air Transport

4th-5th November 2014
DLR in Adlershof
Berlin, Germany

The poster features three images: a white passenger jet flying over clouds, a colorful aerodynamic flow visualization around a wing, and a night view of a modern airport terminal building.



Colloque International / International Conference

Sous le haut patronage de
M. Frédéric Cuvillier
Secrétaire d'Etat chargé des Transports, de la Mer et de la Pêche

3AF
La Société Française de Technologie et de l'Avion

Présent et futur des drones civils
Present and future of civilian RPAS

13 & 14 Nov. 2014
DGAC Paris & ENAC Toulouse
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www.academie-air-espace.com/RPAS

The poster includes logos for AAE (Académie de l'Air et de l'Espace), Airbus, Doves, Apisys, Hovnan, Onera, Safran, Svc, and Thales. It features an image of a yellow and black drone flying over a cityscape.