



aerodays2015

Aviation in Europe – Innovating for Growth

The 7th European Aeronautics Days



L O N D O N



20 – 23 OCTOBER 2015

European Aeronautics Universities – Hatchery of New Knowledge and Breakthrough Technologies

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Role (mission) of University

- **Question** – why are some of the universities considered prestigious („top ten”) and why others are not?

Is it because of teaching, research or perhaps there is another reason for it?

- **To my mind**, the reason behind it ought to be the „leading edge” research.

In other words, these universities lecturers are at the same time **researchers well-known in their fields.**



Innovative thinking and breakthrough technologies

- European Universities**
- proper places for innovative
thinking about
breakthrough technologies**



Disruptive innovation

- **The old question – development by evolution or revolution?**
- **Sustainable development and improvement but at the same time supported by disruptive innovation.**
- **Example – try to decrease SFC, however, do not forget about alternative power unit (fuel cell, solar etc.)**
- **What can we do to change the situation at the European Universities? To make our students more innovative and more innovation-oriented?**



Research ⇔ Education

There is a mutual correlation between contemporary research and education – it is impossible to deliver a modern university lecture without conducting the own, insightful research or design, and it is almost impossible to become a serious, successful researcher or designer not being the graduate of a good, modern university.



Do not make our students stupid!

**„People born ignorant but not stupid.
They are made stupid by education”**

B. Russel, British Philosopher, Mathematician,
Nobel Prize Winner, 1952

**My understanding: do not kill innovative thinking,
do not try to make your student a „perfect robot” being ready
for independent engineering activity, leave a space for a bite
of fantasy and creative innovation.**



Innovative Concepts & Scenarios in Aerospace Engineering

- **No ready answers, no recipes**
- **Remarks**
 - **Disruptive innovation usually needs multidisciplinary approach**
 - **More modern (sometimes not mature) subjects (MEMS, microcomposites, SMA, ...)**
 - **Team effort** → student team projects
 - **Try to attract the best lecturers, research scientists and industrial engineers**
Money invested into the university education is never wasted.

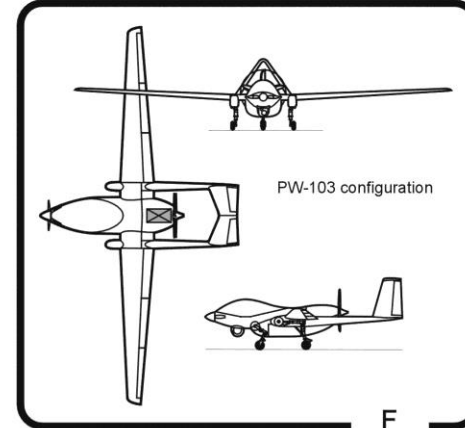
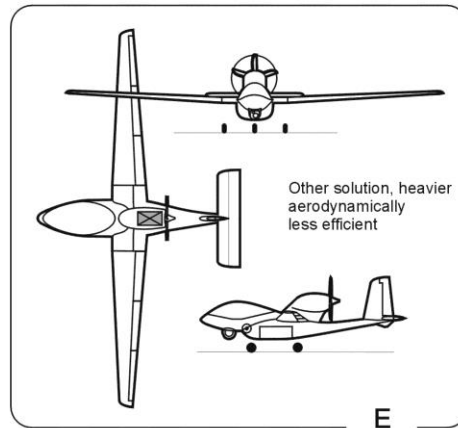
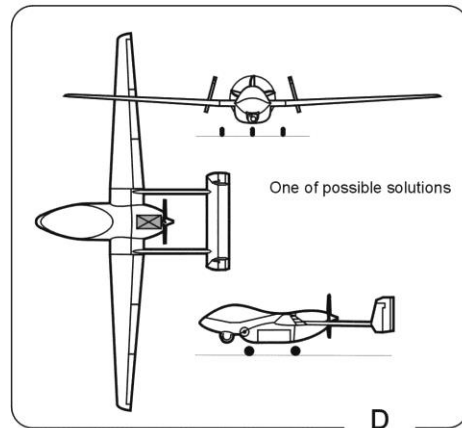
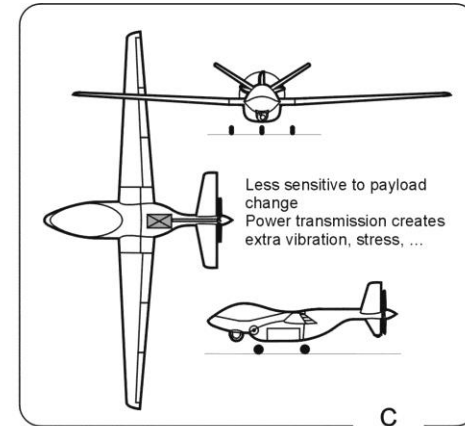
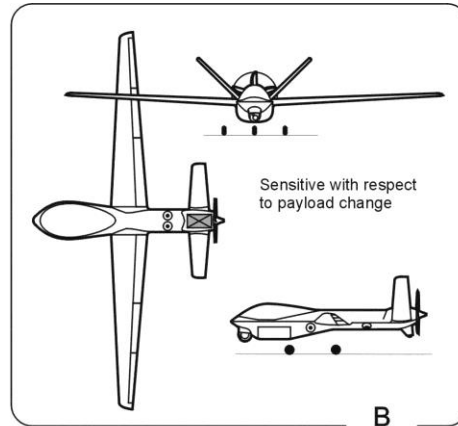
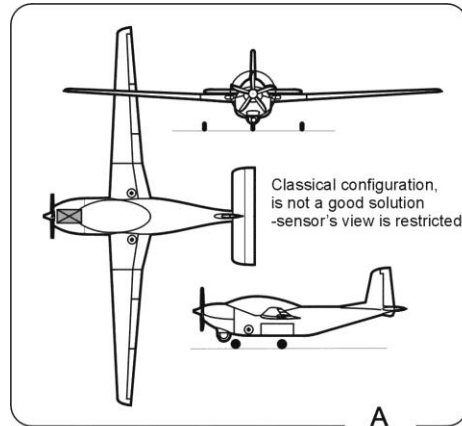


Integrated Design & validation

- **Personal experience** – from Polish perspective, it is even more clear what is an integrated design (in the past, even a propeller and undercarriage were designed from scratch);
- **Nowadays** – design means integration. **How to integrate** in order to make **a new product highly competitive on the market?** Understanding of COTS is important
- **At the university level** validation is usually missed. Sometimes, it is simulated numerically (one checks how it acts in virtual environment). In most cases, the real **validation needs a prototype**, is expensive and an industrial support is needed.



Understanding of integration is also important, try to prepare your students for disruptive innovation



EASN as an Open Association – created to counteract the fragmentation of European Academia

EASN is an **open Association, structuring and representing the European Academia** in Aeronautics research related issues.



Some History... (1/3)



Some History... (2/3)

The long-term goal in establishing EASN was to built up an **open, unique European platform** in order to **structure, support and upgrade the research activities of the European Aeronautics Universities** as well as to facilitate them to respond to their key role in realizing the goals of the European Research Area.

The **European Aeronautics Science Network principles** have **obtained the support of the commission** thanks to two funded Specific Support Actions (**SSAs**) with durations from 01.01.2002 to 30.06.2005 and from 01.10.2006 to 31.12.2008.



Some History... (3/3)

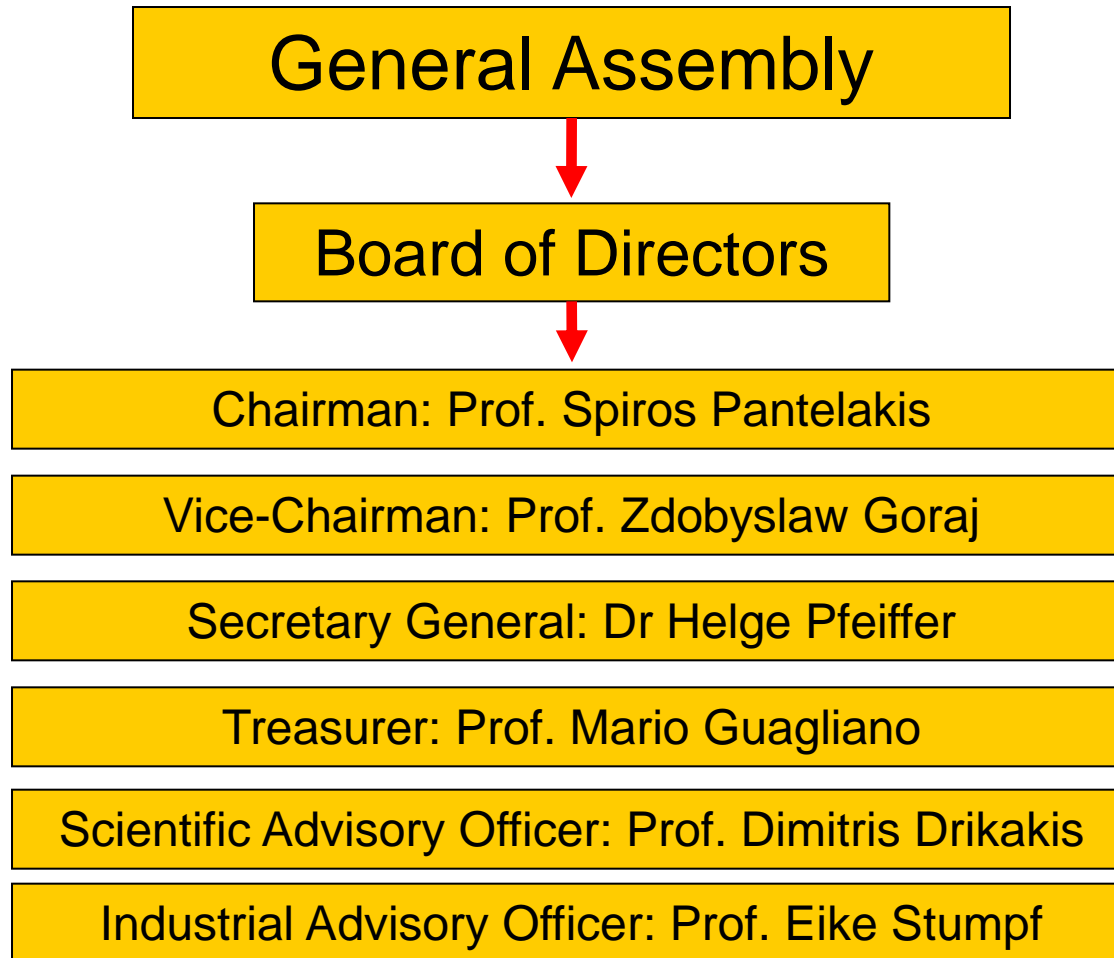
On 06.05.2008, the **EASN Association** was founded by 22 founding members and the support of the Commission and several University professors throughout Europe

Main features of the EASN Association:

- **Self-funded and self sustainable**
- **International** association
- Coordinated and **run by a board of directors** who are elected by the general assembly for a 3-year term. The position of a board member **is unsalaried**
- All steps and actions taken are **in accordance with the statutes of the Association**



Our structure ...



What is the role of Universities in Aeronautics research

- European universities have a **key role in the chain of the European Aeronautics Stakeholders** by providing **education of scientists** as well as **generating basic research** and **incubating technological innovation and breakthrough technologies**
- Academic research is often based on “**out of the box**” thinking which often **leads to fresh ideas and new concepts**
- Especially for the **countries with limited aeronautical industry, universities are the key players concerning aeronautics related research**



Role of the EASN Association

The **primary aim of the EASN Association** is the advancement of the aeronautics sciences and technologies



Role of EASN in the European research community

- **To promote**, encourage, coordinate and focus **joint efforts between Universities, Research Organizations, Industry and SMEs** which are active in Europe in the field of aeronautics and aerospace.
- **To support innovative research** in general and support European Universities, University Departments and Institutes as well as University research staff to perform aeronautics related research in particular.
- **To support** the **scientific and technological cooperation** and human mobility **within the area of its cognitive** subject and the organization of and the participation to relative activities.
- **To disseminate knowledge and technological innovation** and execute dissemination work through its participation either **on its own or within the framework of consortia** in national or international projects and research programs related to aerospace.
- To act as a **communication platform between the European Aeronautics Academia and the professional Associations of other stakeholders**, governmental and state authorities, the European Commission, etc.



EASN Association members

Effective members (with voting rights)

- Individuals from European Academia or other Universities - similar organisations, who are active in Aeronautics related research.

Associate members

- Individuals from Research establishments, SMEs and Industries, who are active in aeronautical research activities and cooperate with the academia.
- Entities such as Universities, University departments, REs, SMEs, Industries, other associations, professional organisations or governmental agencies (e.g. EEC) subscribing to the objectives of the Association.
- Each entity will be represented by a single person.

Honorary members

- The title of Honorary Member or Honorary President may be granted by the General Assembly to persons who have rendered outstanding services to the Association.
- Honorary President takes juris et de jure part in the General Assembly and Board meetings with a consultative vote.

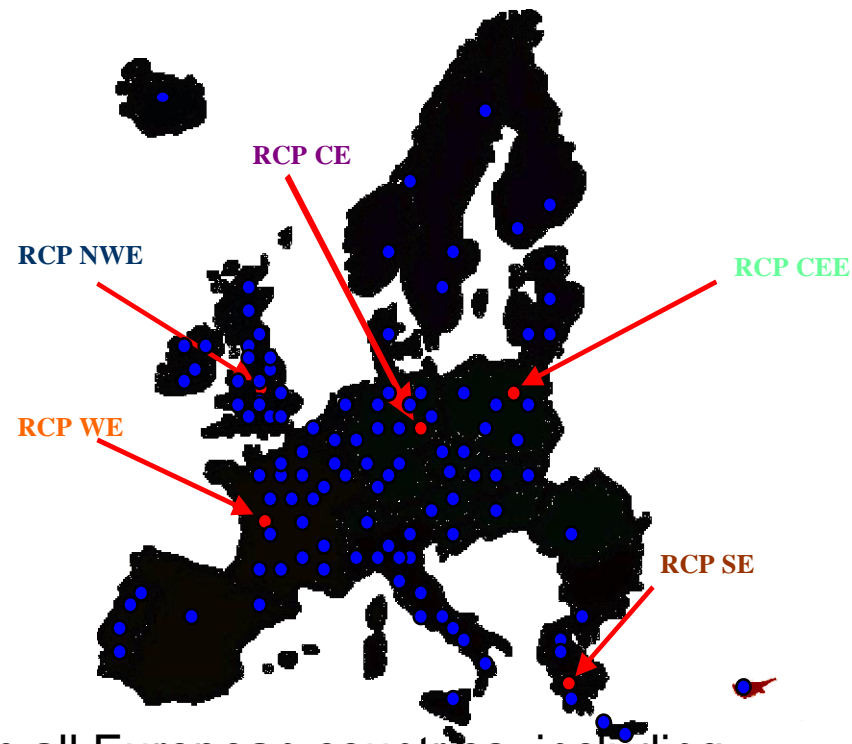


Thematic & Regional Structure

Thematic

Regional

1. Flight Physics
2. Aerostructures
3. Propulsion
4. Aircraft Avionics, Systems and Equipment
5. Flight Mechanics
6. Integrated Design & Validation
7. Air Traffic Management
8. Airports
9. Human Factors
10. Innovative Concepts and Scenarios



Currently, EASN associates 281 members from all European countries, including several entities (Universities, labs, REs, SMEs etc), counting up to 10.000 professionals throughout Europe.



EASN Interest Groups (1/2)

Objectives

- Enhance **closer cooperation** between scientists from the European academia with joint scientific and technological interests in aeronautics and facilitate research cooperation with research establishments and industry by **focusing on innovative ideas and upstream research**
- **Identify the capabilities** existing across Europe
- **Facilitate communication** between individuals and stimulate the transfer of know-how
- **Provide information on research opportunities**
- **Promote awareness for scientific and technological aspects in aeronautics**



EASN Interest Groups (2/2)

- The EASN Interest Groups (**IGs**) **represent the active technological and scientific cells** of EASN
- The existing EASN **IGs are exploited to:**
 - **provide a mechanism for incubating innovation, new technologies and breakthrough concepts**
 - **provide input towards the development of a University Research Strategy** for the sector of Aeronautics
- An outcome of the activities of the EASN IGs has been the **suggestion of research subjects relevant to the EU Framework Programmes** and the **joint submission of several excellent proposals**



EASN website

Further information about EASN and its activities can be found on the EASN website

www.EASN.net

All colleagues are cordially **invited to join the EASN Association**. Registration to the EASN database can be made **on-line through the EASN website**



Conclusion and recommendation

- European Aerospace Sector can become a global leader only if „European Academia” is a real partner for industry & research sector. It is not yet so!
- What to do to strengthen European Academia?
 - Tackle isolation and research fragmentation (EASN)
 - Attract to Academia the outstanding engineers & researchers (money is needed).
 - Give to Academia representatives a real influence on „decision making process” (through ACARE, maybe on domestic level through a „local” ACARE or technology platforms or other forums)
 - EASN – main goal – how to strengthen the role of European Academia to improve its partner position with respect to industry and research establishment

