

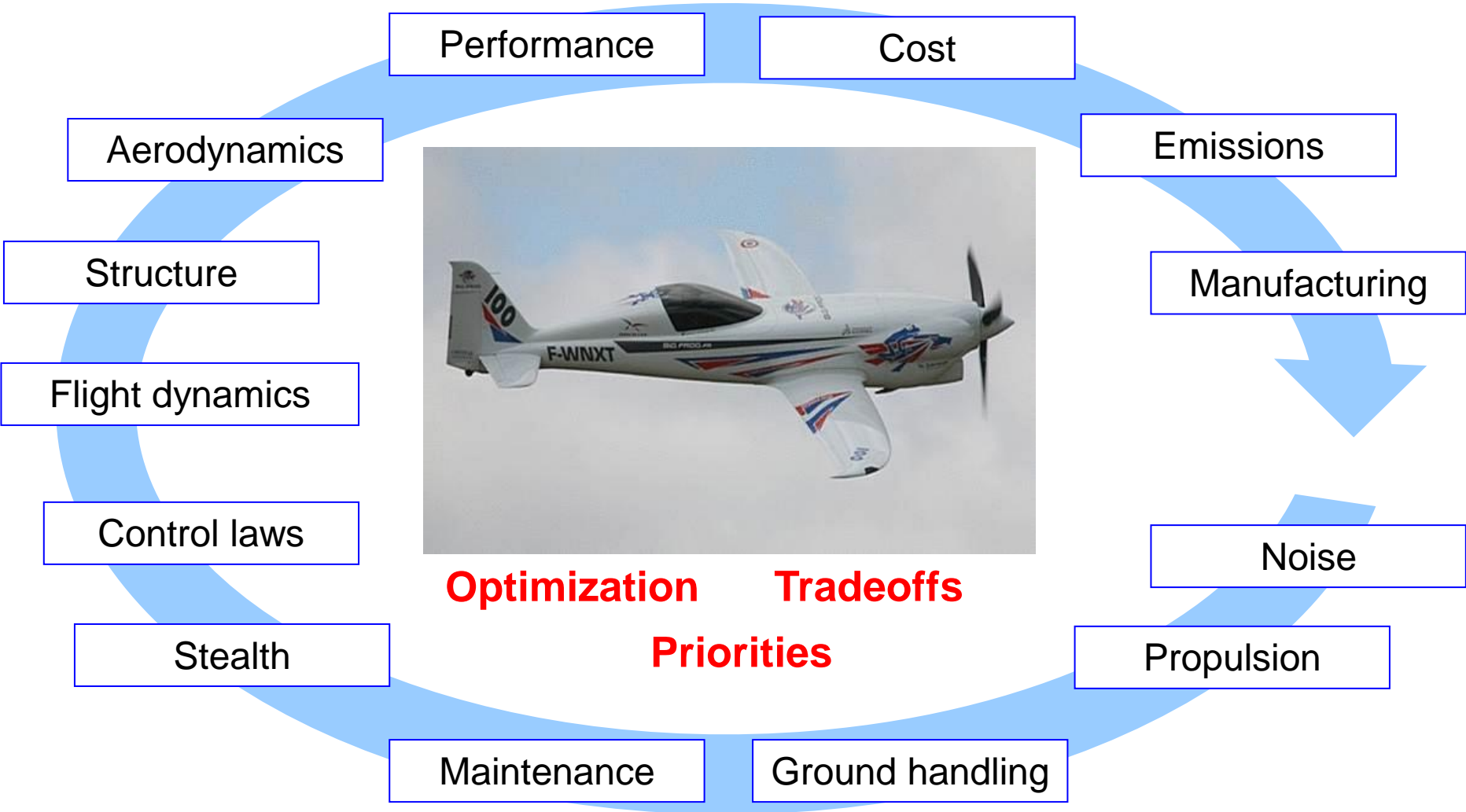


25•27 November 2014
ONERA TOULOUSE • France



4th Symposium of Collaboration in Aircraft Design

B. Nagel (DLR), P. Schmollgruber (ONERA)



From Aerospace & defense 2013 year in review and 2014 forecast (PWC)

- Industrial vision
- Innovative concepts
- MDO and tools
- Reference aircraft

Summary (US\$ billions)	2013	2012	Change
Revenue	\$719	\$692	4%
Operating profit	\$66	\$60	10%

#	Company	Operating Profit (US\$ millions)		
		2013	2012	Change
1	Boeing	6,562	6,290	4%
2	Airbus	3,462	2,665	29%
3	Lockheed Martin	4,505	4,434	2%
4	United Technologies	4,488	3,245	38%
5	General Dynamics	3,085	833	342%
6	BAE Systems	1,259	2,544	-50%
7	Northrop Grumman	3,123	3,130	0%
8	Rolls-Royce	2,801	2,309	21%
9	Raytheon	2,938	2,989	-2%
10	GE Aviation	4,345	3,747	16%
11	Finmeccanica	01	(082)	109%
12	Safran	2,333	1,792	30%
13	Thales	1,332	1,191	12%

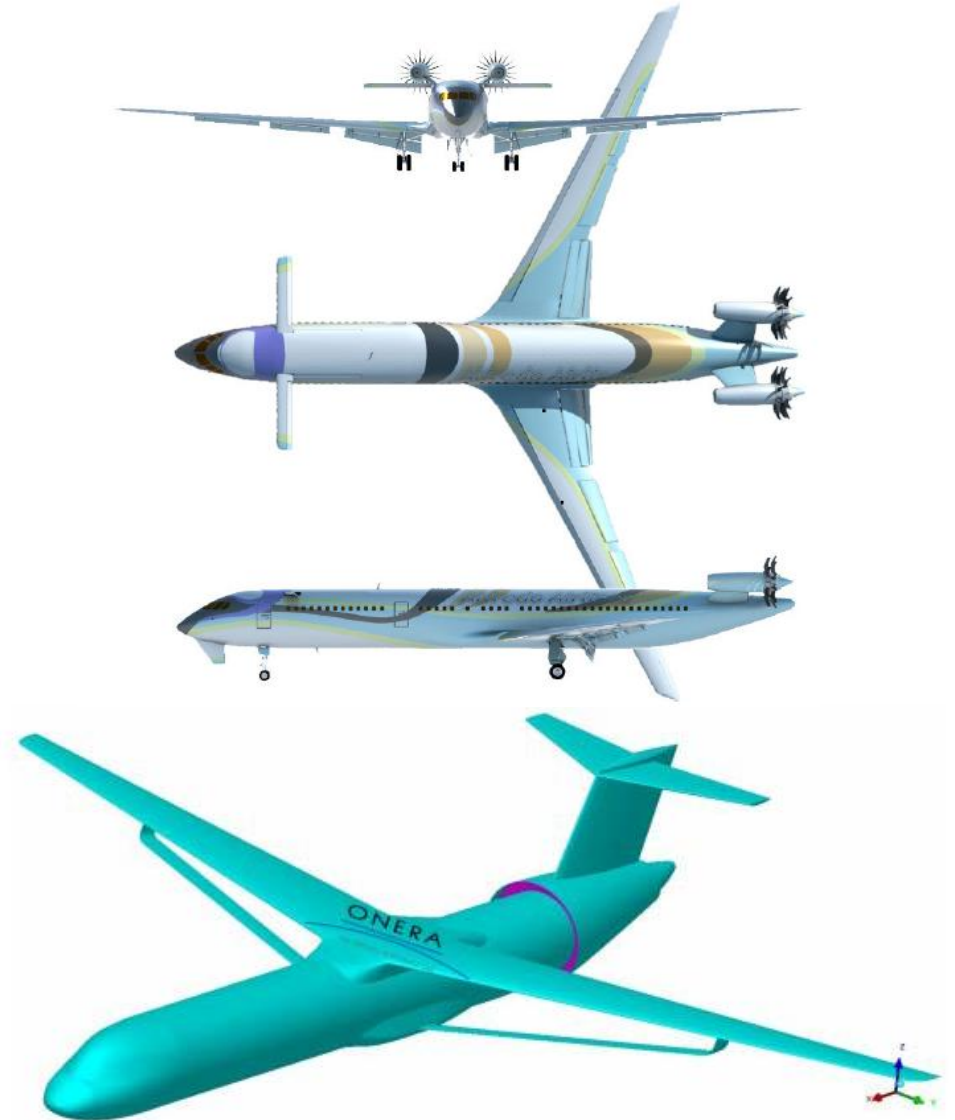
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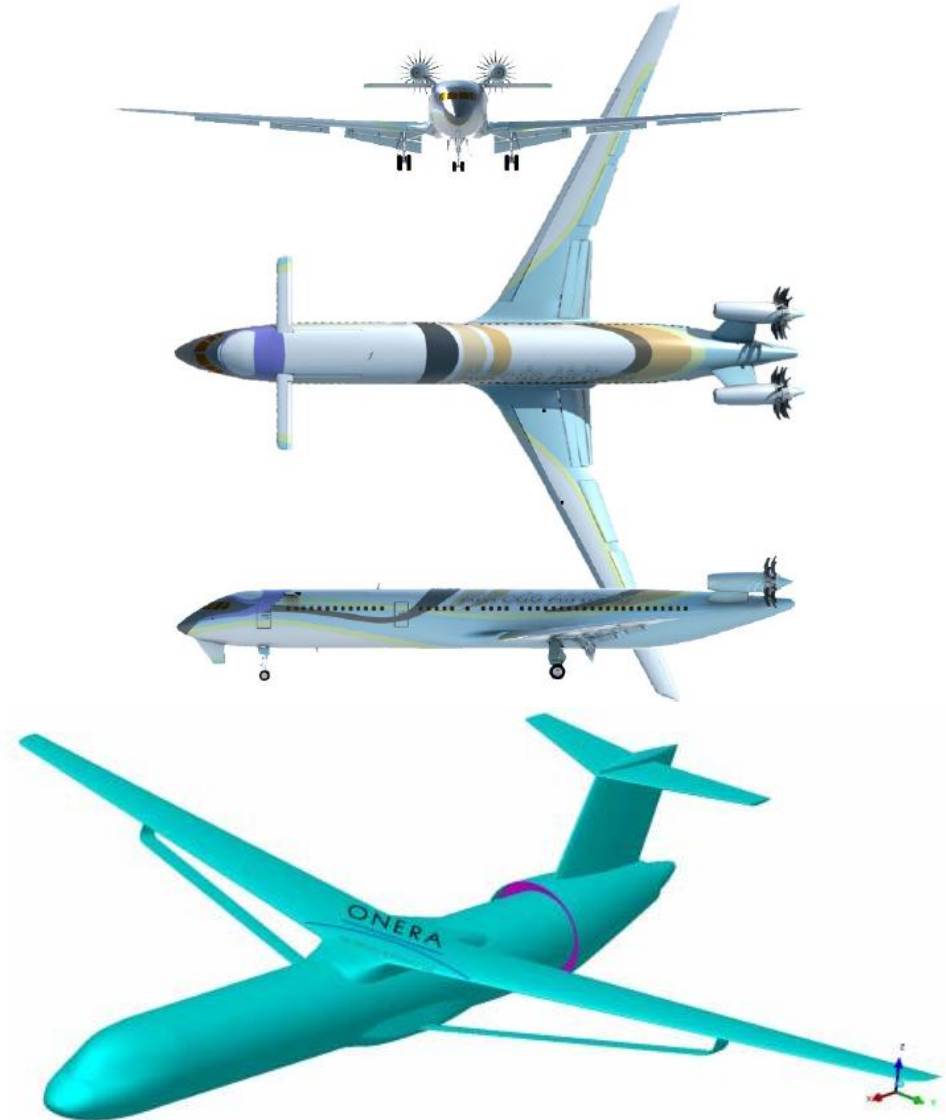
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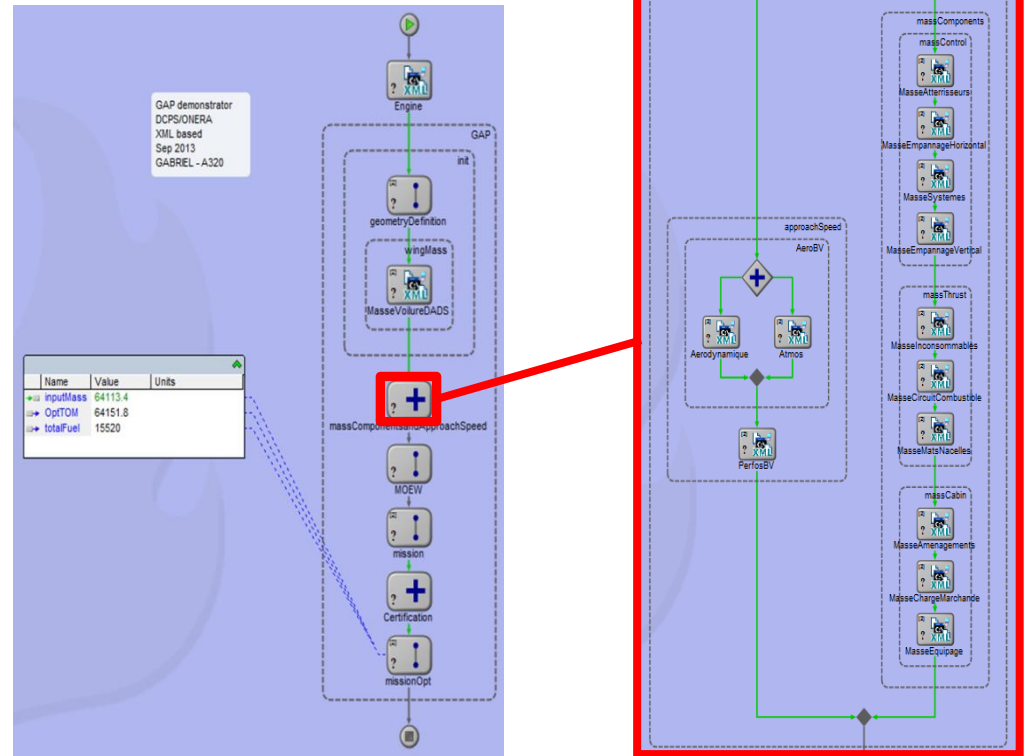
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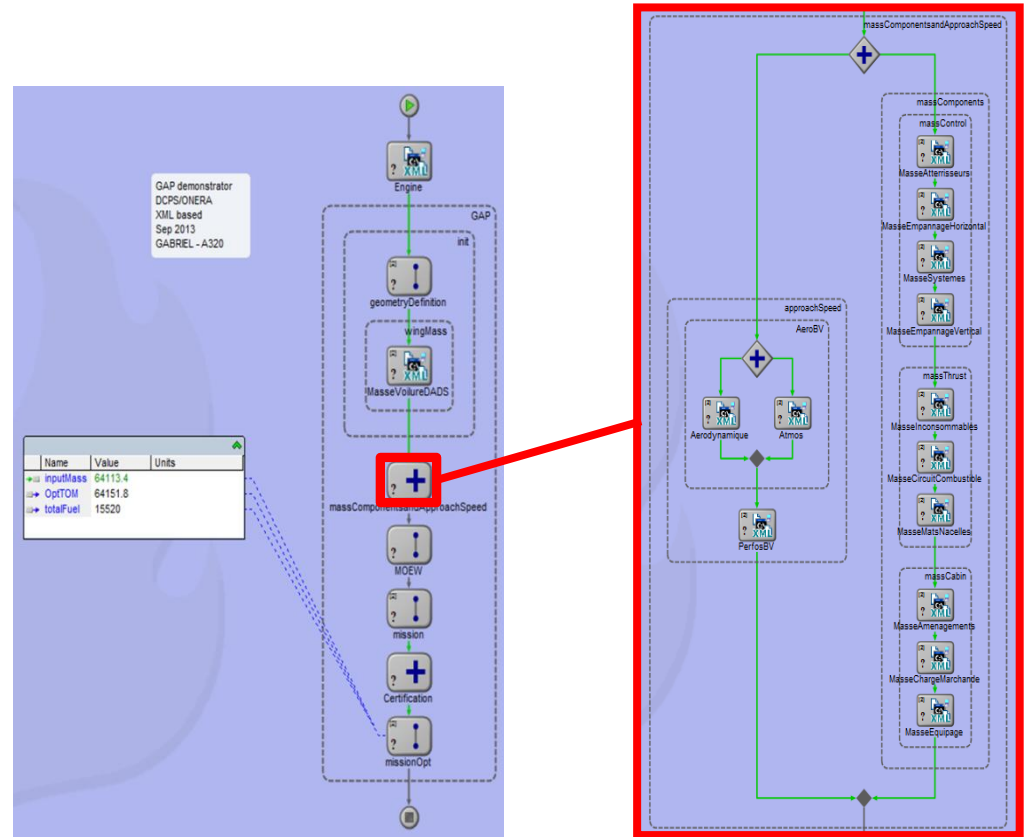
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- Reference aircraft

	Take-Off Weight [Kg]	Variation [%]	Total Fuel Weight [Kg]	Variation [%]
Reference Single Aisle A/C	73771	0.76	19502	3.0
Reference Single Aisle A/C with E-Taxi	73212	REFERENCE	18943	REFERENCE
GABRIEL Single Aisle A/C * <i>No belly fairing (landing gear weight is included)</i>	71848	-1.9	17962	-5.2
GABRIEL Single Aisle A/C * <i>No belly fairing and Fixing system (no landing gear)</i>	69556	-5.0	17621	-7.0
GABRIEL Single Aisle A/C No belly fairing, Fixing system and New engine	68934	-5.8	17481	-7.7
GABRIEL Single Aisle A/C No belly fairing, Fixing system, New engine (No Thrust Reversers)	68034	-7.1	17331	-8.5

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- Exchange of information on finalized, ongoing and planned **research activities**
- **Collaboration** in complementary research
- Cross-validation and **benchmarking** of similar research
- Fostering **synergies** and eliminating unnecessary efforts
- Exchange on **Aircraft Design Education**
- Documentation
 - Sharing presentations (www.aircraftdesign.org)
 - Publication possibilities

- Wi-Fi
- Restaurant
- Return tickets
 - Send .pdf
 - Can be printed
- After the technical tour
 - Back to Jean-Jaurès Metro station
- Contact number : 05 62 25 25 25

Thank you Nadine !

Education Section

Exchange on education and education related research.

European Workshop on Aircraft Design Education
EWADE.

Meetings every 2 years.

Research Section

Joint programming and collaboration in research.

Symposium on Collaboration in Aircraft Design
SCAD.

Meetings every year.

Education Section

Dieter Scholz

HAW Hamburg

Gianfranco La Rocca

TU Delft

Next EWADE is integrated into CEAS Air and Space Conference 2015, Delft

Research Section

Björn Nagel

DLR

Peter Schmollgruber

ONERA

Next SCAD TBD: Either with CEAS conference or own event end of 2015.

SCAD Participants

Open to all partners with serious research activities.



Industry & SME

Airbus
Airbus Defense and Space
Airbus Group Innovation
Alenia Aermacchi
BAE Systems
CFS Engineering
DARCORP
Fokker Aerostructures
KE-Works
Noesis Solutions N.V.
PACE GmbH
PIAGGIO
SAAB
SNECMA
THESYS
TWT GmbH

Research

DLR
ONERA
ATI
Bauhaus Luftfahrt
CIAM
FOI
ILOT
INCAS
Moscow Aviation Institute
NASA
NLR
SE Ivchenko-Progress
UK Aerodynamics

Education

HAW Hamburg
TU Delft
Cranfield University
Ecole Pol. Montreal
ENAC
ISAE - SUPAERO
KTH Stockholm
Linköping University
Northwestern Pol. University
Politechnika Warszawska
Politecnico di Milano
RMIT Melbourne

RWTH Aachen
TU Hamburg Harburg
TU München
TU Sofia
TU Warsaw
Uni. Bologna
Uni. Naples
Uni. Pisa
Uni. Pol.de Madrid
Uni. Napoli Federico II
Uni. Bologna
Uni. Colorado

- ToR are formally required by CEAS.
- Should be as simple as possible.
- EWADE and SCAD remain independent sections of TCAD.
- TCAD organizes plateaus to exchange information.
- Participants are responsible for the content they share.
- Information are expected to be non-confidential.

- **Activity Map:** Of participants' ongoing research, permitting partners to get in contact and agree on collaborations if desired.
- Contains
 - Aircraft configurations
 - Design tools
 - Contact details of acting persons
 - List of publications
- Updated once per year during SCAD.

Technology Stream		Partner 1	Partner 2
Short Range A/C	Strut Braced	<ul style="list-style-type: none"> Title Short description of topic Contact (Planned) publication of results Web link (opt.) 	
	Prandtl Plane		
Long Range A/C	BWB		
Tools	Visualization		
Members		Publications	
		2015	2016

- Active member organizations are partners which add at least one activity to the activity list in that year AND „regularly“ participate in the symposia.
- Advanced information, results, the activity map etc. are directly shared among the active members only.
- All results are non-confidential and can be shared with 3rd parties.