AETN Airport Energy Technologies Network

Air Transport Research Workshop
University of Lincoln
School of Engineering
8th and 9th September 2011

EPSRC

EU FP7 MAAT Multibody Advanced Airship for Transport Project

Prof Paul Stewart
Pro Vice Chancellor Research - University of Lincoln

MAAT PROJECT

M.A.A.T. Open Source Project
Multibody Advanced Airship for Transport

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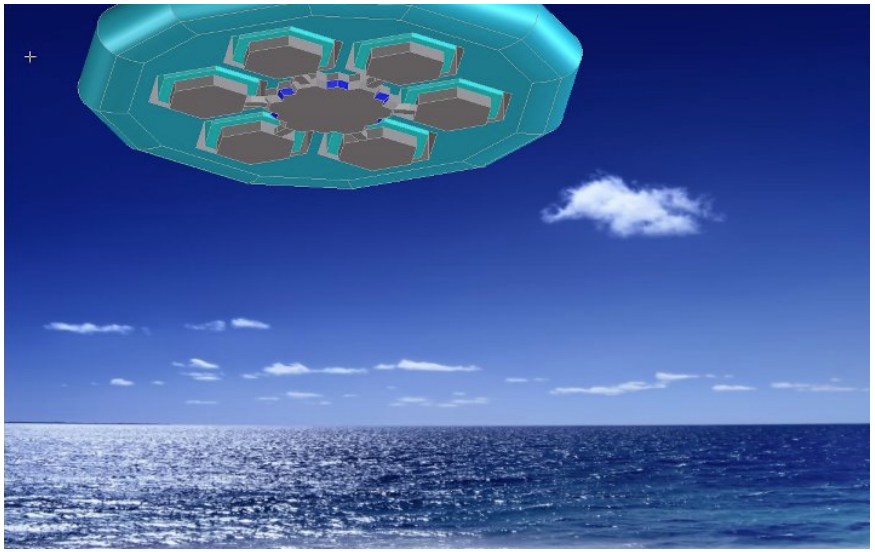
The MAAT Project

Multi-body Advanced Airship for Transport



Coordinator
Contact Person: DELL' AMICO, Mauro (Professor)
UNIVERSITA DEGLI STUDI DI MODENA E REGGIO EMILIA, VIA UNIVERSITA, ITALY

Project Reference: 285602 **Contract Type:** Small or medium-scale focused research project
Project Cost: 5.09 million euro **Project Funding:** 3.77 million euro
Programme Acronym: FP7-TRANSPORT **Programme Type:**7th FWP (Seventh Framework Programme)
Subprogramme Area:
AAT.2011.6.2-1. Novel air transport vehicles, AAT.2011.6.3-1. The cruiser/ feeder concept

Contact Person:
GAVIRAGHI, Giorgio (Dr) **Organization:** EDL S.A., MONTEVIDEO, URUGUAY

Contact Person:
STEWART, Paul (Professor) **Organization:** UNIVERSITY OF LINCOLN, LINCOLN, UNITED KINGDOM

Contact Person:
PSHIKHOPOV, Vyacheslav (Professor) **Organization:** SOUTHERN FEDERAL UNIVERSITY, ROSTOV ON DON, RUSSIAN FEDERATION

Contact Person:
SIMONETTI SPALLOTTA, Roberto (Mr) **Organization:** AERO SEKUR S.P.A., APRILIA, ITALY

Contact Person:
CAMPOS, Francisco (Mr) **Organization:** ENGYS LTD, LONDON, UNITED KINGDOM

Contact Person:
PEREIRA, Dina (Ms.) **Organization:** UNIVERSIDADE DA BEIRA INTERIOR, COVILHA, PORTUGAL

Contact Person:
GÜNSEL, Lars (Mr) **Organization:** LOGISTICNETWORK CONSULTANTS GMBH, HANNOVER, GERMANY

Contact Person: VEREEKEN, Maria (Ms.) **Organization:**, VRIJE UNIVERSITEIT, BRUSSEL, BRUSSEL, BELGIUM

Contact Person: GIBBS, Christopher (Mr) **Organization:** THE UNIVERSITY OF HERTFORDSHIRE HIGHER EDUCATION CORPORATION, HATFIELD, UNITED KINGDOM

Contact Person:
CAFARO, Emilio (Professor) **Organization:** POLITECNICO DI TORINO, TORINO, ITALY

Contact Person:
PERSIANI, Franco (Professor) **Organization:** ALMA MATER STUDIORUM, UNIVERSITA DI BOLOGNA, BOLOGNA, ITALY

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ACARE Advisory Council for Aeronautics Research in Europe

The results of the MAAT contribute to the European ACARE **Strategic Research Agenda** (SRA-2) and **Beyond Vision 2020 (Towards 2050)** becoming an effective milestone of the long range aerial transport of the future.

Project number
285602
Project title
MAAT—Multibody Advanced Airship for Transport
Call (part) identifier
FP7-AAT-2011-RTD-1
Funding scheme
Collaborative project

SPF: FP7-TRANSPORT AAT.2011.6.2-1. Novel air transport vehicles, AAT.2011.6.3-1. The cruiser/feeder concept

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Over 100 companies are occupied in world airship building. Without considering advertising and military aeronautic vehicles, there are 70 large airships in the world. Experts have analyzed principal trends and noted increasing of interest to medium and large airships for basic industries – fuel-energy complex, building, goods transportation, timber industry, metallurgy etc. Airships are optimal type of transport in accordance to set of criteria: delivery time, cost and fuel efficiency.

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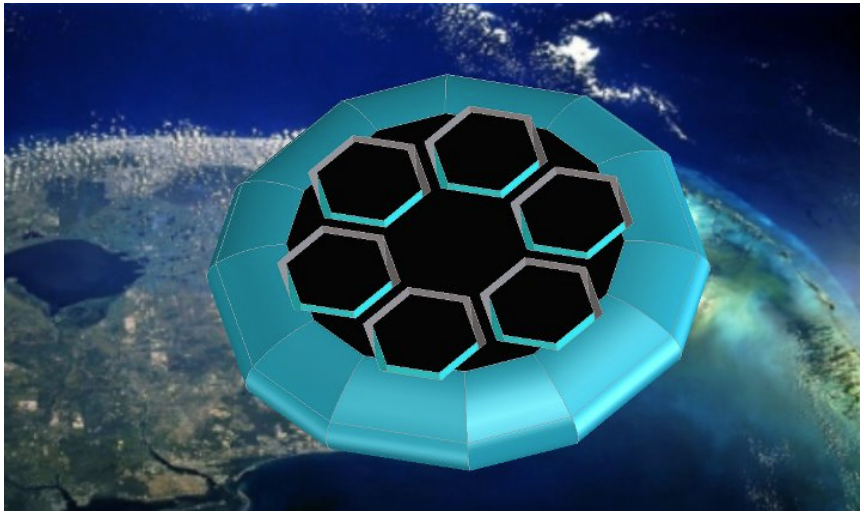

The strengths of the MAAT concept are:
- standardized and modular global air transport system;
- operative altitudes higher than traditional civil routes;
- heavy payload, low cost of transportation and non-stop flight;
- possibility to act as a flying integrated logistics centre;
- self sufficient by photovoltaic propulsion system;
- hovering ability to simplify cruiser/feeder engagement;
- cruiser/feeder transfers in motion;
- VTOL ground operations;
- silent landing and take-off operations;
- cost effective, light and easy to deploy structures on the ground;
- reduced consumption of ground resources.

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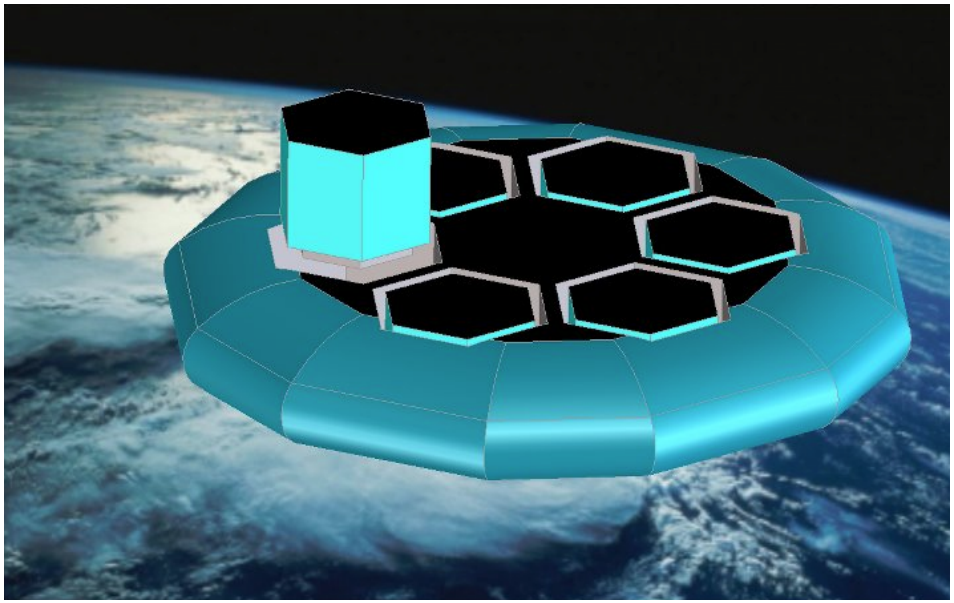

The MAAT project overcomes structural and physical limits of airplanes in cruiser/feeder operation. It aims to investigate an airship cruiser-feeder global transport system for medium and long range transports.

The MAAT system is composed by three modules.

- **PTAH** (Photovoltaic Transport Airship for High-altitudes) is a heavy payload cruiser which remains airborne on stable routes;
- **ATEN** (Air Transport Efficient Network feeder) is a VTOL feeder airship by gas buoyancy linking the cruiser to the ground;
- **AHA** (Airship Hub Airport) is a new concept of low cost vertical airport hub joinable by ATEN, easy to build both in towns and in logistic centres.

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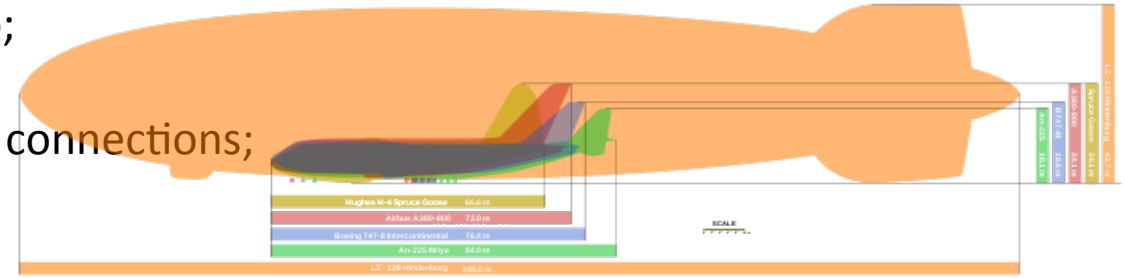
The MAAT Project aims to study the system and its components in a full structured systemic approach and to define:

- the general design of cruiser and feeder, to optimize aerodynamics and photovoltaic energy;
- the preliminary structural draft of cruiser, feeder and hub;
- control systems, procedures and codes for stability and flying attitude control;
- electrical propulsion systems able to overcome the problems related to the low air density;
- operative procedures for rendezvous and joining operations;
- internal design of cabins and cargo;
- study and design of cruiser/feeder connections;
- passive and active safety systems.



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WP Number	WP Title	Type of activity[1]	Lead beneficiary number[2]	Person Months	Start month[3]	End month[4]
1	Project Management and Coordination	MGT	UNIMORE	22	0	36
2	Overall System Design	RTD	UNIMORE	83	0	36
3	Flight Mechanics and Operative Modes	RTD	UH	64	0	30
4	Energetic and Propulsive Systems	RTD	UoL	70	6	36
5	Controls and Telecommunications Systems	RTD	SFEDU	66	6	36
6	Cruiser/Feeder Docking and Joints	RTD	VUB	89	6	36
7	Cabins, Cargos and Transfer Systems	RTD	eDL	64	6	36
8	Concept Testing and Demonstration	RTD	ASKR	40	12	36
9	Dissemination of Results	OTH	LNC	13	0	36
			Total:	511		

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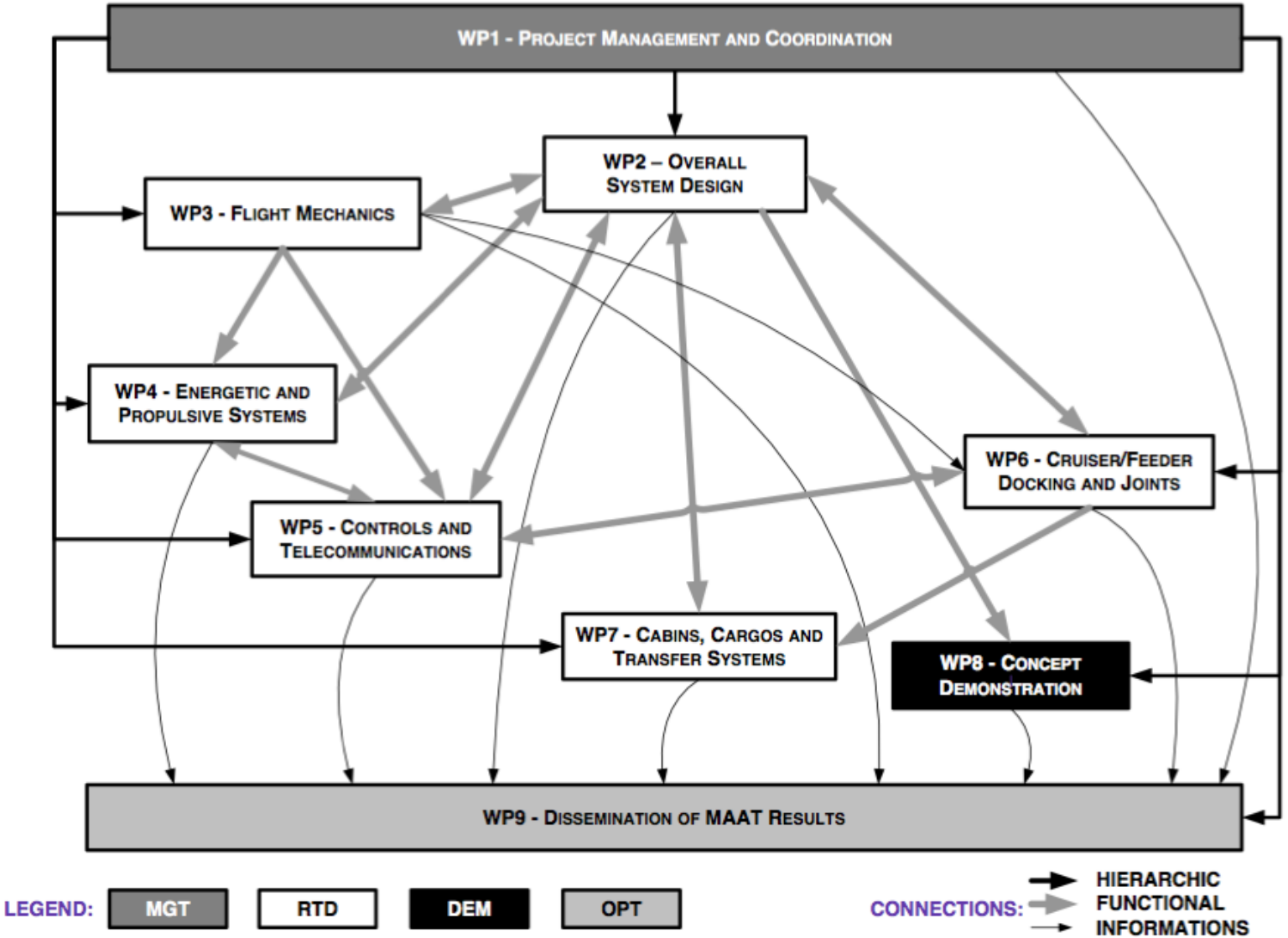

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