



# GABRIEL Introduction

**Prof. – Dr. Jozsef Rohacs  
Rea-Tech Ltd**

**Brussels Meeting**

**29th of August, 2014**



**1. Introduction**

**2. The team**

**3. Idea**

**4. Vision**

**5. Goal and Objectives**

**6. Project structure**

**7. Planned results**

**8. Summary**



# 1. Introduction

## **GABRIEL - Integrated Ground and on-Board system for Support of the Aircraft Safe Take-off and Landing**

Type of funding scheme:

**Collaborative Projects - Small or medium-scale focused research project**

Work program topics addressed:

**FP7- AERONAUTICS and AIR TRANSPORT (AAT) - 2011- RTD-1**

**Activity 7.1.6 Pioneering the air transport of the future**

**Area 7.1.6.3 Promising Pioneering Ideas in Air Transport**

**AAT.2011.6.3-2 Take-off and Landing with Ground-based Power**



## 2. The team

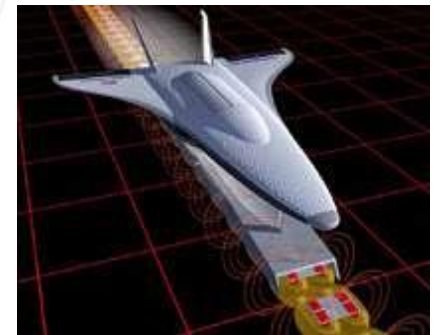
### List of participants:

Participant no.	Participant organisation name	Country
1	REA-TECH Engineering and Architect Ltd. (REA)	Hungary
2	Slot Consulting (SLOT)	Hungary
3	Delft University of Technology (TUD)	Netherlands
4	The French Aerospace Lab (ONERA)	France
6	RWTH Aachen University (RWTH)	Germany
6	Dieter Rogg (DRogg)	Germany
7	Ad Cuenta (AdC)	Netherlands
8	National Aerospace Laboratory (NLR)	Netherlands
9	Rezeszov University of Technology (RzUT)	Poland
10	Wroclav University of Technology (WrUT)	Poland
11	Italian Airspace Research Center (CIRA)	Italy
12	University of Salerno (UoS)	Italy



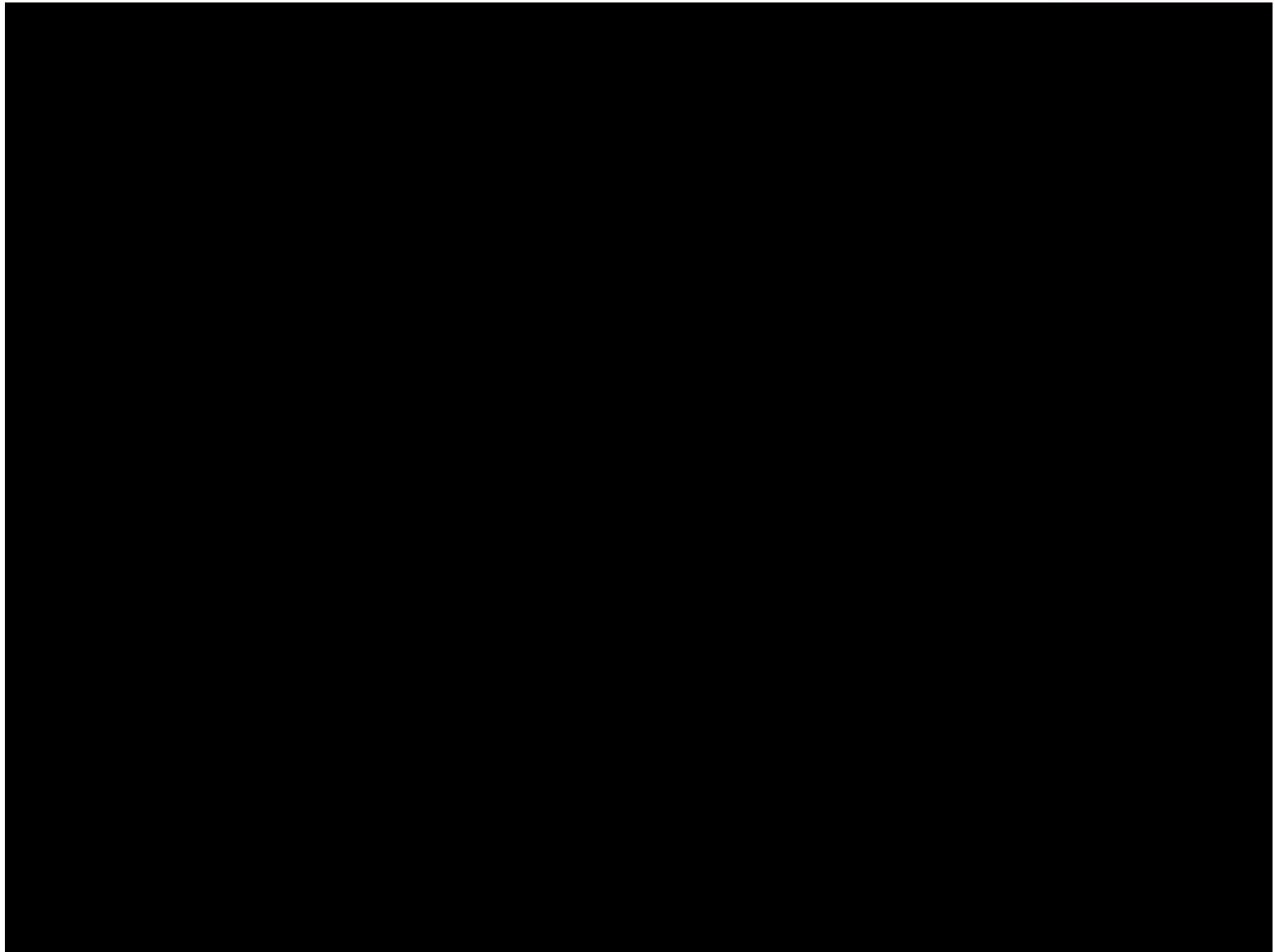
## 3. Idea

- 1946: US Naval Air Test Center investigated an electric catapult.
- Since 1990: the magnetic levitation system has implemented by rapid train systems, widely.
- 2000: US Naval Air System Command and General Atomic started work on the Electromagnetic Aircraft Launch System.
- 2008: Gabriel project has initiated
- Gabriel system – use of magnetic levitation system to ground based assisting the aircraft take-off and landing.





# 3. Idea





## 4. Vision

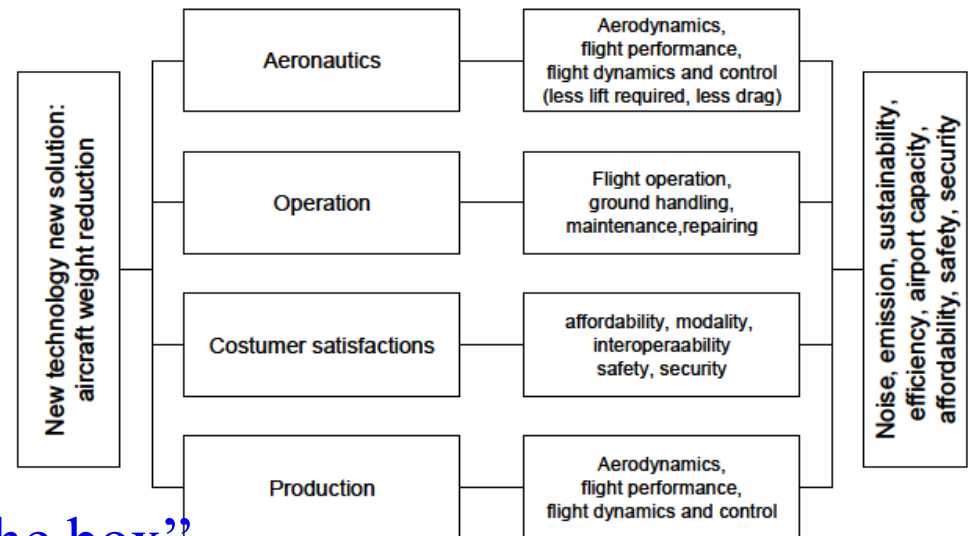
The air transport rapidly growth and causes further problems of

- capacity,
- efficiency
- safety and
- greening.

**Solution:** development of the revolutionary new technologies, by reinforcing „thinking out of the box”.

Magnetic levitation is a reliable safe new technology

- that may generated real added values, but
- it needs fundamental studies in its
  - possible implementation
  - efficiency and
  - safety (!).





## 5. Goal and Objectives

### Goal:

Gabriel will investigate if using the magnetic levitation system to assist the aircraft take-off and landing is

- feasible,
- cost effective and
- safe.

### Objectives:

- concept exploration and analysis;
- concept development;
- concept validation;
- impact assessment.



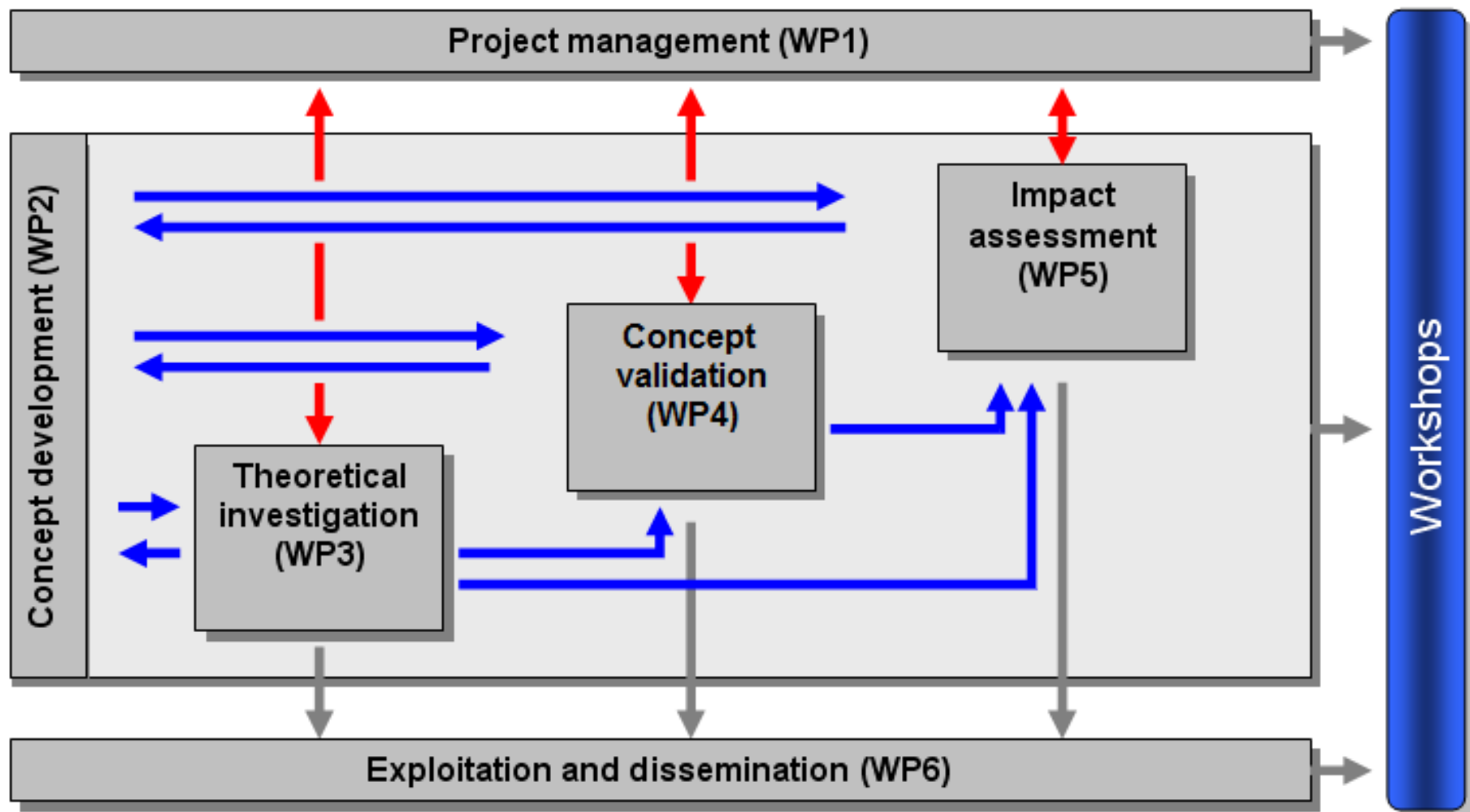
### Key elements:

- concept development
- comparison with A320
- small scale demonstration





# 6. Project structure





## 7. Planned results

The Gabriel deals with first step: (extended) theoretical investigation.

The theoretical investigations:

- energetic analysis,
- structural analysis,
- control synthesis,
- safety investigation
- Impact assessment analysis

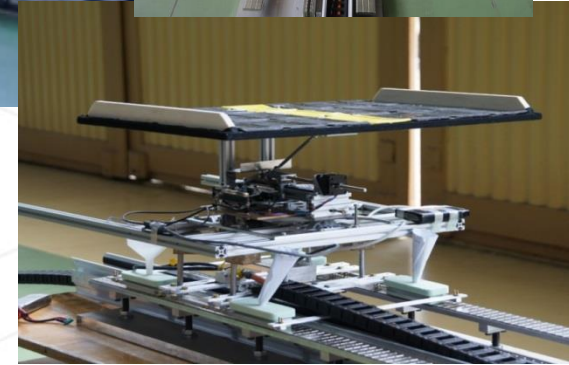
and practical studies

- with small aircraft model
- magnetic test bench

must results to decision about the

- applicability and efficiency of the Gabriel concept,
- possible solution of the safety problem (landing in emergency situation)
- impact assessments

and should result to validated operation concept.





## 8. Summary

- **Gabriel** – L1 pioneering project in which
  - 12 partners from 7 countries
  - works on utilization of the magnetic levitation as
  - ground based system assisting the aircraft take-off and landing.
- Gabriel investigate whether maglev assisted TOL processes are feasible, cost-effective and safe.
- The project deals with
  - concept exploration and analysis;
  - concept development;
  - concept validation;
  - impact assessment.