

EUROPEAN AIRPORT MOVEMENT MANAGEMENT BY A-SMGCS, Part 2

EMMA2 Introduction

EMMA2 Demonstration Day
Malpensa, 2009-02-26

Michael Roeder

Internet: <http://www.dlr.de/emma2>

Integrated Project of the
Sixth Framework Programme,
Priority 1.4:
Aeronautics and Space,
sponsored by EC, DG TREN
Contract FP6-513522



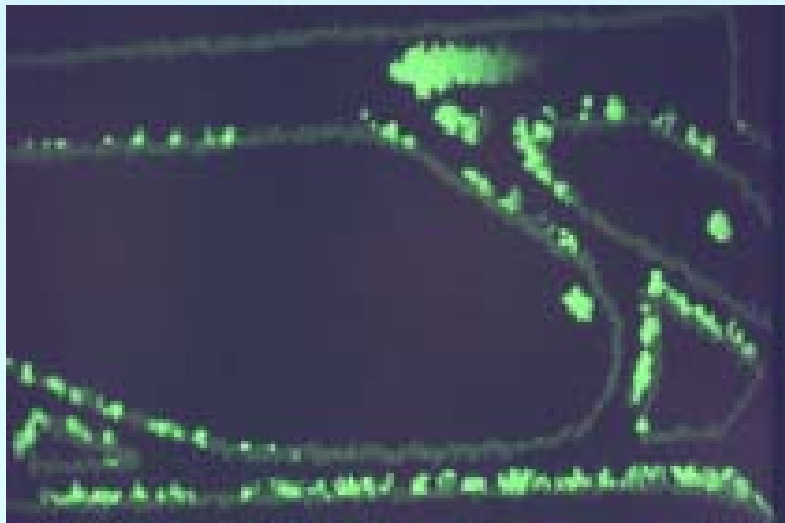
**“Don’t ask what Vision 2020 can do for us
... but ask what **EMMA2** can do for Vision 2020.”**

**European Airport Movement Management by
A-SMGCS, Part 2**

Focusing on the higher services of A-SMGCS

Airport operations:






- bottle-neck
- weather dependant
- state of technology:



Problem solution:

Advanced **S**urface **M**ovement
Guidance and **C**ontrol **S**ystem
(A-SMGCS)



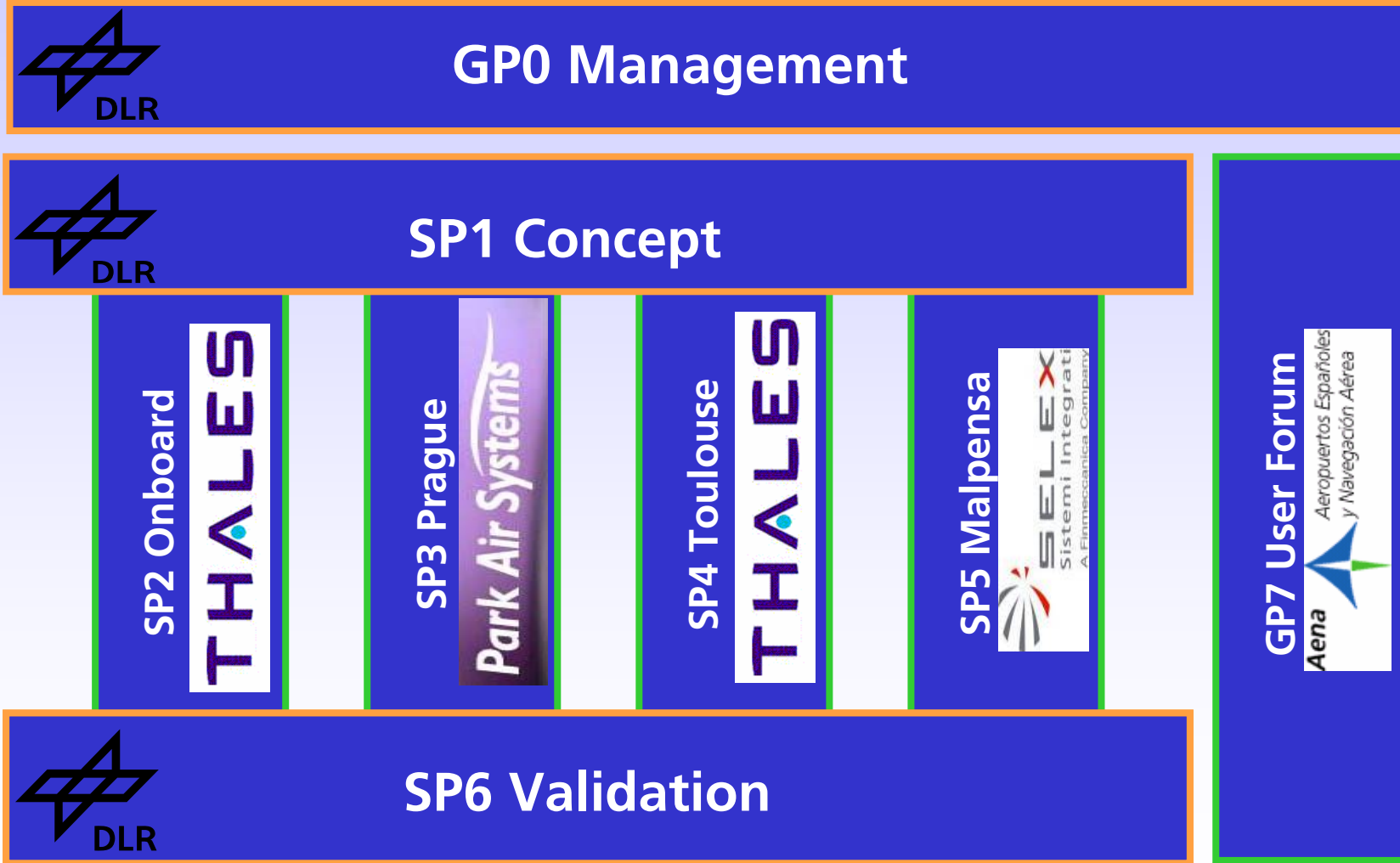
EU-Project	EU-Framework Programme	Duration	Focus	
	<p>Emphasising</p> <ul style="list-style-type: none"> – operational procedures – validation – onboard services 		Demonstration of the technology	
			First implementations under operational conditions	
	<u>E</u> uropean Airport <u>M</u> ovement <u>M</u> anagement by <u>A</u> -SMGCS	6. 	2004-2006	<u>Paving the way to harmonise the implementation of</u> <u>A-SMGCS surveillance & control</u>
	Part <u>2</u>		2006-2008	<u>... and higher services of A-SMGCS.</u>

EMMA2 Partners

(in alphabetical order)

 <p>Aena Aeropuertos Españoles y Navegación Aérea</p>	 <p>AIRBUS</p>	 <p>Air Navigation Services of the Czech Republic</p>	 <p>Athens University of Economics and Business</p>
 <p>DFS Deutsche Flugsicherung</p>	 <p>dgac DSNA</p>	 <p>DIEHL Aerospace</p>	 <p>DLR</p>
 <p>egis avia Sofréavia</p>	 <p>ENAV S.p.A. SOCIETÀ NAZIONALE PER L'ASSISTENZA AL VOLO</p>	 <p>ERA RADAR TECHNOLOGY</p>	 <p>EUROCONTROL</p>
 <p>funkwerk avionics</p>	 <p>NLR</p>	 <p>Park Air Systems</p>	 <p>Prague Airport</p>
 <p>SELEX Sistemi Integrati A Finmeccanica Company</p>	 <p>Sicta</p>	 <p>THALES THALES</p>	 <p>TECHNISCHE UNIVERSITÄT DARMSTADT</p>

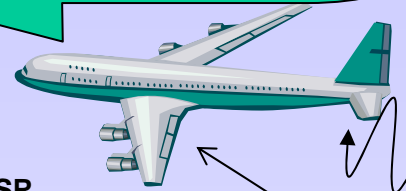
Structure of EMMA2



EMMA2 Services



EMM, GTD
TCD, SMA
HUD, DB



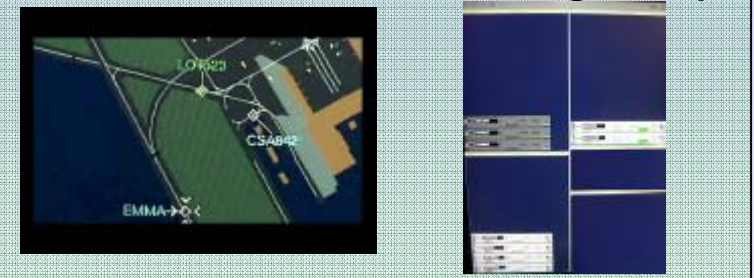
Mode A/C/S SSR
ADS-B 1090ES

TAXI-CPDLC

TAXI-CPDLC

VDL2
Ground
Radio

Traffic Situation + Electronic Flight Strips



TIS-B

Non-Cooperative Sensors

SMR → Target Extractor

Other non-coop. Sensors

Cooperative Sensors

ASR → RDPS

Mode-S Multilateration

other coop. Sensors (e.g. ADS-B)

TIS-B
Ground
Station

LAN

Surveillance

Conflict Prediction, Detection, and Alerting

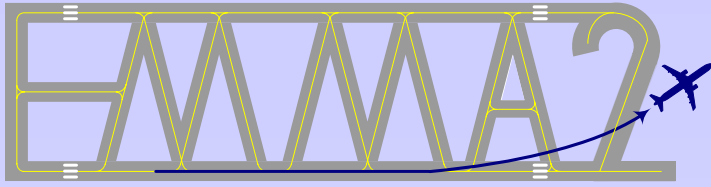
Planning

Routing DMAN

FDPS MET STAND

DLR 20

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Conclusions

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Internet: <http://www.dlr.de/emma2>
Intranet: <https://extsites.dlr.de/fl/emma>

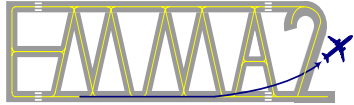
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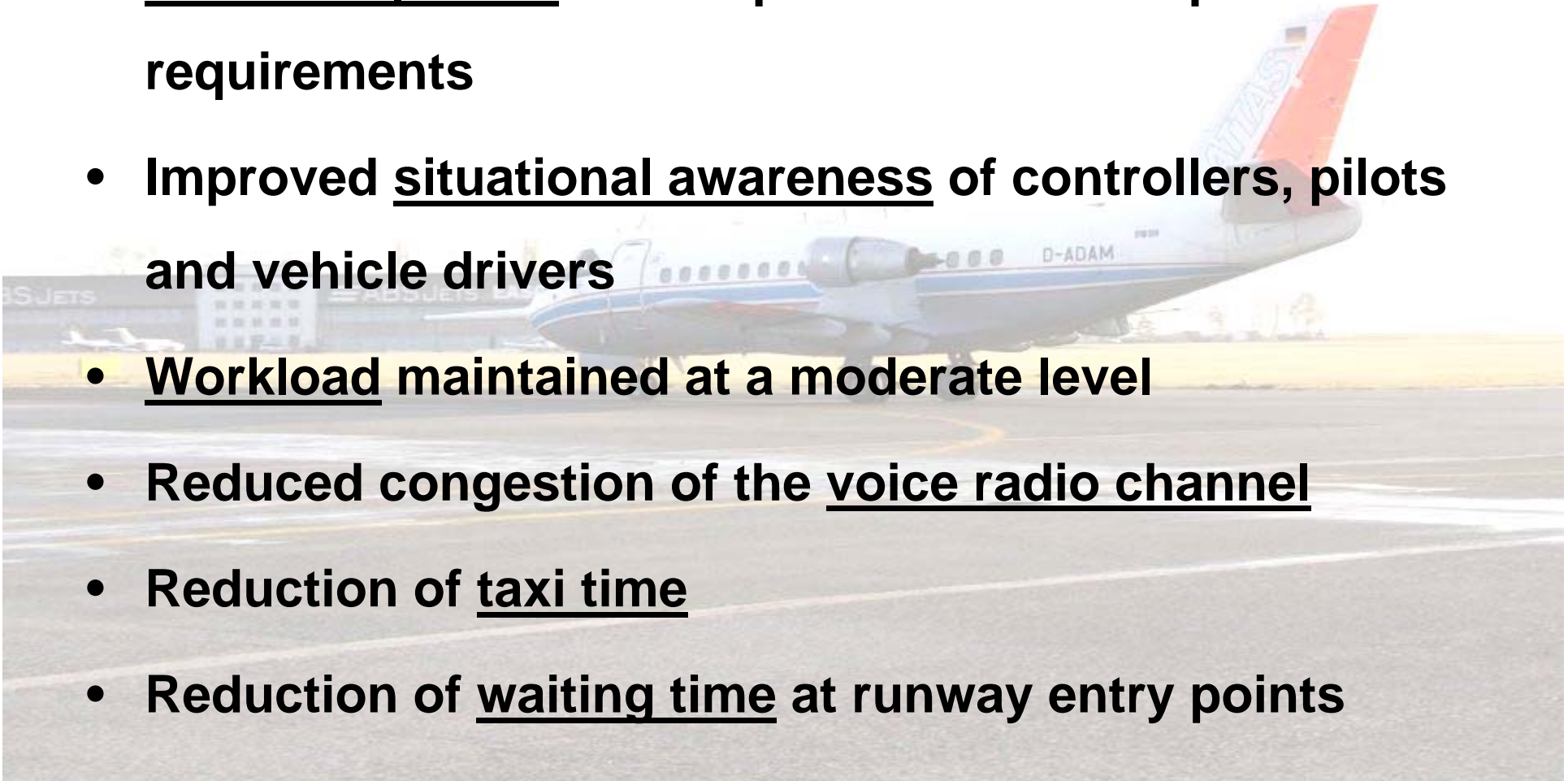
Main Achievements

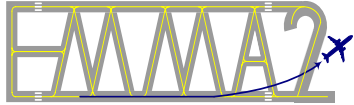
- **Development of a preliminary Concept for a complete A-SMGCS**
- **Higher-level A-SMGCS services concept developed, integrated and tested at:**
 - **5 Tower Simulation Platforms**
 - **4 Cockpit Simulation Platforms**
 - **3 European Airports (PRG, MXP, TLS)**
 - **2 Test Aircraft**
 - **1 Test Van and several other Test Vehicles**
- **Valuable feedback to ATM R&D, in particular to SESAR**



Main Results

- Proof of technical feasibility
- User acceptance of new procedures and operational requirements
- Improved situational awareness of controllers, pilots and vehicle drivers
- Workload maintained at a moderate level
- Reduced congestion of the voice radio channel
- Reduction of taxi time
- Reduction of waiting time at runway entry points





Main Recommendations

- **EMMA2 has demonstrated**
 - operational feasibility
 - operational improvements of A-SMGCS higher servicesnow ANSPs, airports and airlines should investigate local implementation needs
- **A-SMGCS activities should form an important part of SESAR**
- **Ensure the coordination of A-SMGCS activities in the different SESAR projects e.g.:**
 - operational procedures
 - technical enablers



Final Statement

- **Starting 2004 the EMMA consortium has validated**
 - **Surveillance display**
 - **Runway alerting**
 - **Onboard Moving Map**
- **Since 2006 the EMMA2 consortium has shown the operational feasibility of several systems**
 - **DMAN**
 - **Routing**
 - **TIS-B / GTD / TCD / SMA**
 - **TAXI-CPDLC via Ground EFS and Onboard CDTI**
- **We want to continue with validation of higher A-SMGCS services for operational use**

Thank you for your attention!

Questions?

www.dlr.de/emma2

2-D671 Analysis Report

2-D672 Recommendations Report