

*Airbone New and Advanced Satellite techniques and Technologies
in A System Integrated Approach*

ANASTASIA
Presentation to
EUROCAE
WG28

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ANASTASIA

- **Airborne New and Advanced Satellite Techniques and technologies in A System Integrated Approach**
- **part of the 6th Framework Programme of the European Union**
- **Number of partners : 30**
- **Coordination : Thales Avionics**
- **Starting date : 01 April 2005**
- **Duration : 48 months**
- **Total budget ~ 20M € (EU contribution ~11M €)**

Objectives

- **New needs : improve operational capacity and safety of the air transport system : By 2020, the Air Traffic will be increased by 200-300%**

- **Define the new Communication & Navigation techniques and technologies beyond 2010**
 - ◆ **New on-board aircraft CNS solutions need:**
 - **More accurate localisation**
 - **High bandwidth data links**
 - **Acceptable cost constraints**

- **New space based technology : Satcom, Satellite Navigation**

- **Anastasia Objectives : To study and assess the **integration of on-board Navigation and Communication architectures** based on **space technologies** that will be available for aircraft between 2010 and 2020.**

State of the art

- Navigation : receivers for satellite localisation
 - **mono-constellation, mono-frequency receivers and antennas**
 - **Hybridisation (inertial)**
 - **sensitivity to interferences and multipath**
 - ➔ ◆ **Not able to insure the level of accuracy, availability, and integrity needed for future a/c operation**
- Communication : high bandwidth Satcom antennas
 - **High cost ku Rx-Tx phase array antenna**
 - **2 separated L band and ku band Satcom antennas**
 - ➔ ◆ **Wide band antennas only on few LR (cost on LR, no room and cost on single aisle impeach the service deployment)**

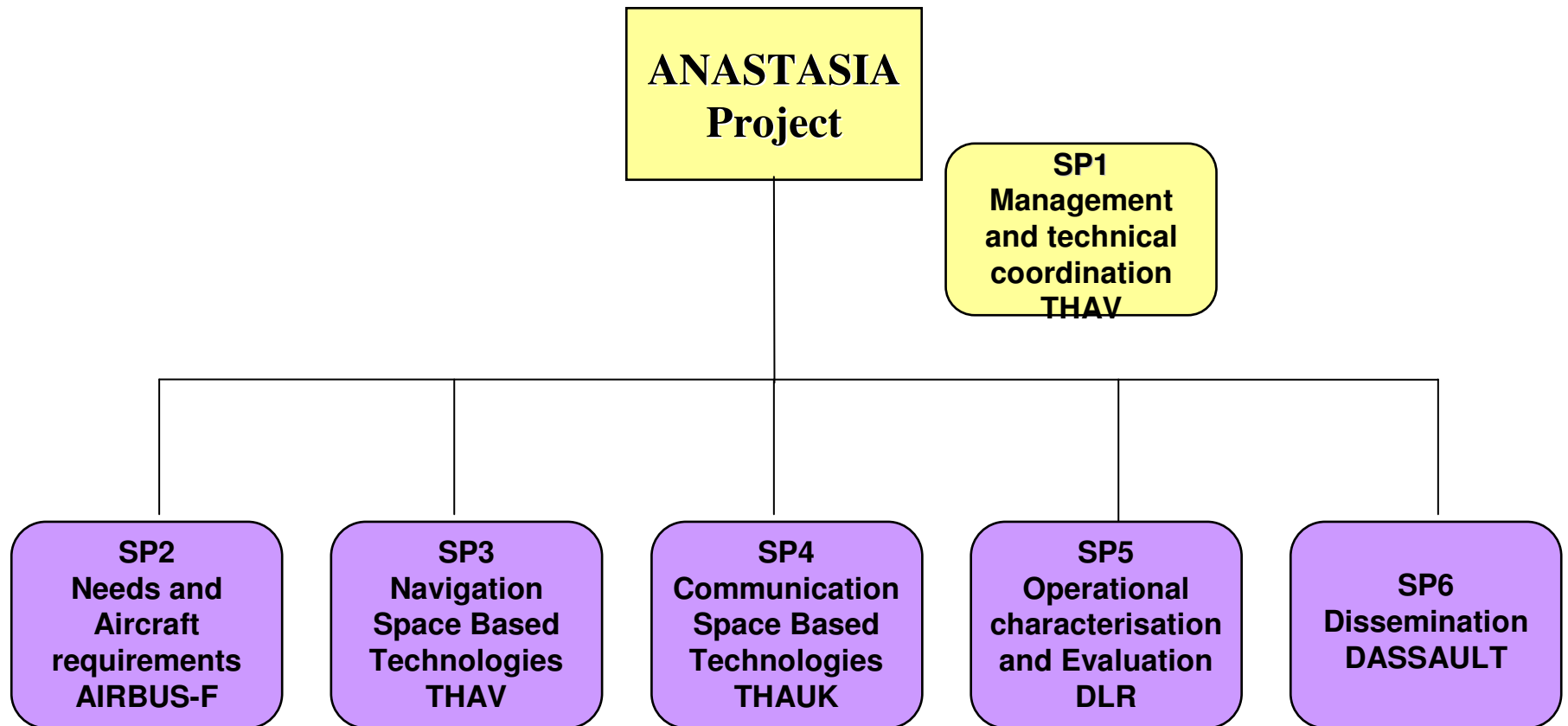
Innovation

- Navigation : receivers for satellite localisation
 - **Multi-constellation, multi-frequency receivers and antennas**
 - **Hybridation (new MEMS inertial systems)**
 - **interferences and multipath mitigation new algorithms**
 - ◆ **to insure the level of accuracy, availability, and integrity needed for future a/c operation (GBAS CAT3 , ASMGCS, low RNP, aut. CAT1)**
- Communication : high bandwidth Satcom antennas
 - **Overall system design**
 - **Competitive low cost dual frequency L-ku antennas**
 - **Multifrequency (L, Ku), conformal phase array antennas**
 - ◆ **To allow the wide deployment of cost effective Satcom solutions for both cockpit and cabin applications**

Project Objectives

- **Outputs :**
 - **A set of evaluated technologies and architectures for satellite based avionics**
 - **An assessment of the performances of the new satellite based Nav and Com architectures and technologies**
 - **The requirements and the roadmap for the new Nav and Com systems incorporating both ATM and airframers needs**
 - **A proposal of the best architectures and technologies for Nav and Com functions (with cost/benefit analysis)**
 - **Contributions to standards**

ANASTASIA WBS – Sp level



Anastasia WBS

- **SP 2 : To Identify the requirements for the new satellite based CN(s) functions for both business jets and airtransport.**

- **SP3 : To Investigate the space based systems and to Define the different techniques & technologies for an optimal use of new space based technologies in an air board system**

- **SP 4 : To identify and Describe the optimum system for on board communications services**

- **SP 5 : To assess the performances of key Nav and Com technologies in actual environment (simulation and flight trials)**

- **SP6 : To disseminate the results**

An Invitation to the ANASTASIA User Forum
- Future aircraft CNS needs and possible satellite based solutions -

10 & 11 January 2006

*Hotel Sofitel centre
 84, Allées Jean Jaurès
 31000 Toulouse, France*

ANASTASIA PROJECT
 Airborne Next Advanced Satellite Techniques and Technologies in a System Integrated Approach

INMARSAT 4
 New Aeronautical Communication for ATC-ACC-ACC

GPS
 GALILEO
 New Satellite Navigation Systems

New On-board Technologies

The New on board Satellite based Navigation, Communication Systems and Technologies

EUROPEAN COMMISSION PROJECT
 6th FRAMEWORK PROGRAMME (2002-2006)

ANASTASIA

January, 10th

- 14h00** **Welcome/Introduction to the forum**
- 14h15** **Anastasia objectives and planned work**
- 14h30** **Future navigation and communication needs:**
 - 14h30** **Air Traffic Control (SESAME)**
 - 15h10** **Airline (Lufthansa -DLH-)**
 - 15h50** *Coffee Break*
 - 16h05** **Industry (Airbus and Dassault)**
 - 17h35** **Air Traffic Management SATCOM (Eurocontrol/Thales)**
- 18h15** **Conclusion/resume of the first day**
- 18h30** *Cocktail party*

January, 11th

- 9h00** **CNS requirements captured by ANASTASIA to date**
- 10h00** *Coffee break*
- 10h15** **Navigation workshop:**
Working session to discuss and develop the ideas and issues raised and to correlate them with areas of ANASTASIA research.
- 11h15** **Communication Workshop:**
Working session to discuss and develop the ideas and issues raised and to correlate them with areas of ANASTASIA research.
- 12h15** **Summary and Conclusions**
- 12h30** *End of the forum*