Airborne Integrated Systems for Safety Improvement, Flight Hazard Protection and All Weather Operations: "FLYSAFE"

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The challenge of Air Transport Safety

- Air traffic will **triple** in the next **20 years**

- Ambition of Vision 2020 is that increased traffic will **not** be accompanied by **increased** accidents, meaning …

  … the performance of safety-related systems and procedures must be **tripled** in the 20 years

- This improvement must be achieved with:
  - All weather operation
  - Operation at airports 24 hours per day
  - 99% of flight departing within 15 min of schedule
Several EU programmes deal with the challenge of maintaining the high level of safety of Air Transport.

FLYSAFE contributes to meeting the ACARE agenda objective through:

- the design, validation and testing of a on-board Integrated Surveillance System (ISS), going a generation further than the emerging integrated safety systems.
- the design, validation and testing of ground Weather Information Management Systems (WIMSs), gathering all relevant atmospheric information to inform the aircraft along their mission.

These systems are designed to deal with:
- All flight phases
- All weather situation
- At minimum cost and weight
FLYSAFE deals more particularly with 7 of the 10 Contributors identified in the SRA:

- Elimination of CFIT
- Minimise factors contributing to LoC
- Maintain Safe Separation Between Aircraft
- Minimising Atmospheric Hazards
- Effective and Safer Approach and Landing
- Effective and Safer Ground Operation
- Identification & Prevention of Future Hazards
- Increasing survivability and injury reduction in aircraft accidents and incidents
- Methods and Tools for engineering and certification
- Ensuring effective and reliable human performance
The FLYSAFE Project

- Project full title: *Airborne Integrated Systems for Safety Improvement, Flight Hazard Protection and All Weather Operations*

- Integrated Project of the 6th Framework Programme of the European Commission

  - Coordinator: THALES, Toulouse
  - 36 Partners from 14 countries
  - 53 million €
  - EC contribution: 29 million €

- Started on February 1st, 2005
- Duration: 4 years
The FLYSAFE consortium

36 Partners from 14 different countries constitute a powerful consortium
FLYSAFE Partners location

- Austria
- Belgium
- France
- Germany
- Greece
- Italy
- Malta
- Netherlands
- Portugal
- Russia
- Slovenia
- Spain
- Sweden
- UK

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FLYSAFE is also supported by the External Expert Advisory Group, grouping:

- Pilots and persons from airborne operations
- Air Traffic controllers
- Certification authorities
- Weather specialists
- EU reviewers

They meet regularly with the FLYSAFE Team and provide guidance/advice on the way forward.
FLYSAFE overall concept
FLYSAFE NG-ISS

FLYSAFE will design and develop a new NG-ISS with:

- New **on-board systems and functions**
  - improved situation awareness
  - advanced warning
  - alert prioritisation
  - enhanced human-machine interfaces
- New **sensors** and sensor **fusion** technique
- Improved on-board weather hazard detection and data fusion with new ground-based, specific weather hazard information products, uplinked to the aircraft
- All on-board means integrated in a **consistent** system, with **innovative HMI**
- And their **integration** into a global ATM **environment**
FLYSAFE NGISS on-board architecture

Data transmitted to the aircraft: WIMS data + standard product for volcanic ashes, standard MET forecast products
Data transmitted to the ground: atmospheric report, altitude, P, T, humidity, EDR
FLYSAFE will develop ground-based Weather Information Management Systems (WIMS):

- They will provide accurate forecasts of specific atmospheric hazards to be uplinked to the cockpit and copied to Air traffic Management (ATM).
- 4 WIMSs, addressing:
  - Clear Air Turbulence
  - Thunderstorms
  - Icing
  - Wake vortices
- Information on hazards currently available will also be uplinked to the cockpit (including volcanic ash).
WIMs will provide route relevant information particular to the specific flight on three scales:

- Global scale, with particular emphasis on field of view of satellite image
  - Low resolution data and relatively infrequent updates
- Continental scale
  - Mid resolution data and fairly frequent updates
- TMA scale
  - High resolution data with frequent updates
How are WIMS going to operate?
- By combining data from a range of different sources
- Following example for CB (thunderstorms) WIMS illustrates process
FLYSAFE WBS - level 1

FLYSAFE

WP 0 Management
WP 7 Exploitation, standards & dissemination

WP 1 Operational Assessment
WP 2 Atmospheric hazards
WP 3 Traffic hazards
WP 4 Terrain hazards
WP 5 Next Generation Integrated Surveillance System
WP 6 Evaluation & Results assessment
Status and Next steps

- Relationship are excellent, as well as the willingness to produce together innovative systems reaching the objectives set

- Detailed specifications will be finished in the 5 next months

- Presentations will be made in 2008 / 2009

- Open Forums will be the opportunity to present you the developed solutions. If you wish to attend please leave us your address.
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