



aerodays2015

Aviation in Europe – Innovating for Growth

The 7th European Aeronautics Days



L O N D O N



20 – 23 OCTOBER 2015

All Condition Operations and Innovative Cockpit Infrastructure (ALICIA)

- The ALICIA Programme – EU sponsored integrated technology demonstrator programme
 - Addressed fixed wing and rotorcraft platforms with focus on two major objectives:
 - Development of technologies to support future All Conditions Operations
 - Explore opportunities for exploitation of common cockpit design features and technologies across fixed wing and rotorcraft platforms
- Contract
 - Total value €47M,
 - EC Grant €27.8M,
 - 5 year programme
- Consortium
 - Programme coordinator AgustaWestland
 - 41 partners representing Industry, Academia and Research organisations
 - Lead partners; Thales Avionics, Alenia Aermacchi, Diehl Aerospace, BAE Systems, Dassault Aviation,

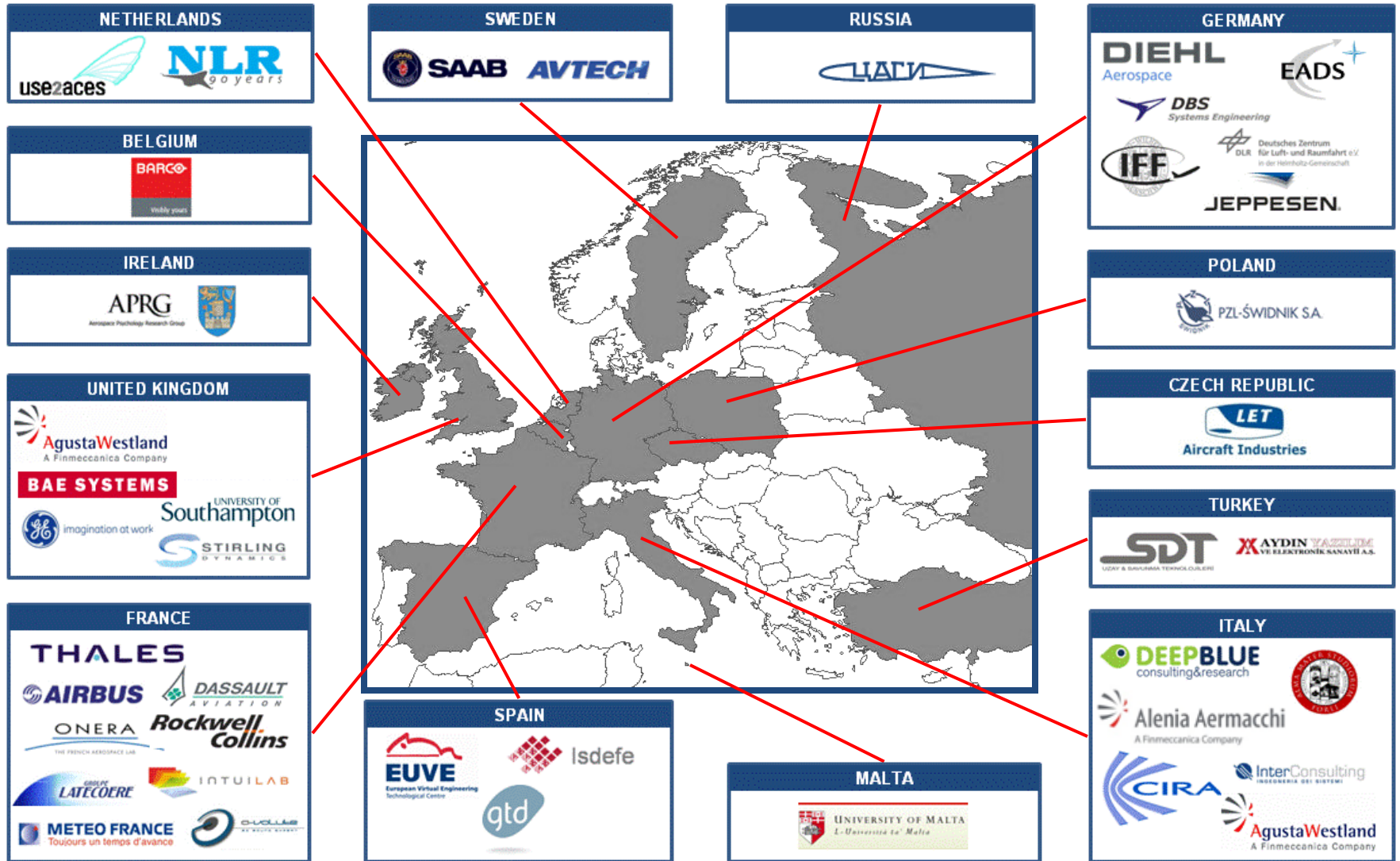


ALICIA Consortium

- Consortium Balance:
 - Platform Integrators (8)
 - System / Equipment Suppliers (7)
 - Technology Specialists (8)
 - Research Organisations (7)
 - Universities (5)
 - Experts (6)
- 56 months duration
 - Started September 2009
 - Finished August 2014



Project Partners – by geographic region



ALICIA – Primary Project Focus

- Civil aircraft cockpit system capabilities
 - Transport aircraft
 - Rotorcraft
 - Fixed Wing
- All Condition Operations Capability
 - Targeting weather related delays
 - Extending the aircraft operating envelope
 - Improving safety within the air transport system
- Interoperability with future Air Transport Systems
 - Managed airspace
 - Unmanaged airspace
- New cockpit architectures
 - Introduction of enabling technologies and applications
 - Optimised crew workload
 - Targeting reduced through life costs



Need For Innovation – Key Business Drivers

- Air transport demand is increasing – Europe/Global
- Legacy ATS requires modification – Europe/Global
- Weather related delays – significant cost impact
- Increased levels of safety required
- Manufacturing industry; product innovation essential to sustain European employment
- Global competition
- Aircraft cockpit systems integration complexity
 - Aircraft/ATC level
 - Crew/avionic systems
- Customer/consumer expectation



European Strategic Alignment – Key Business Drivers

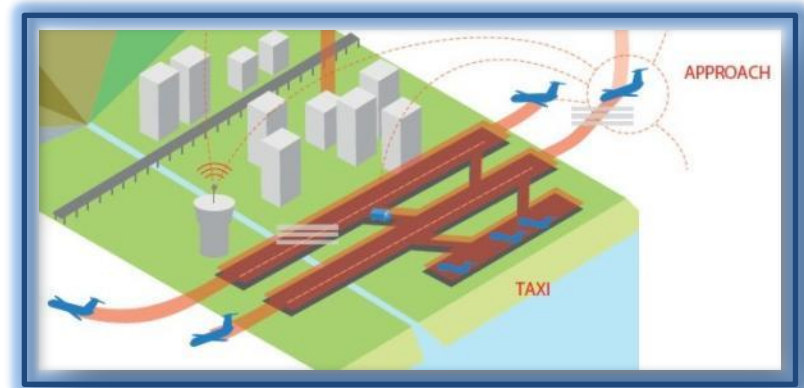
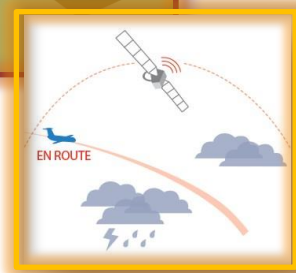
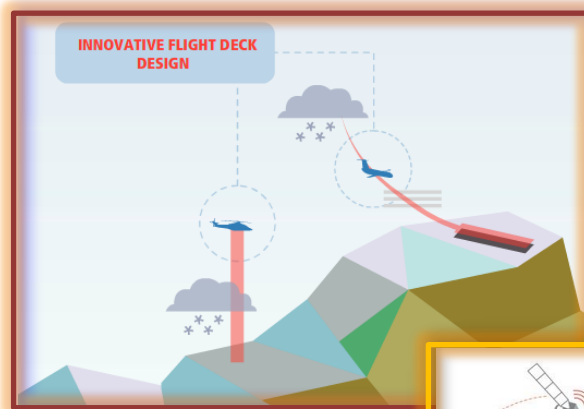
- European Framework Project 7
 - Strengthening Europe's scientific and technological base
 - Supporting (Europe's) international competitiveness and the EU policies
- ACARE SRA-2
 - High Level Target Concepts (HLTC)
 - Highly Customer Oriented HLTC
 - Highly Time Efficient HLTC
 - Highly Cost Effective HLTC
- European Air Traffic Management Master Plan



The ALICIA System Drivers

Global Air Transport System – Operational Drivers

- All condition operations
- Current & future airspace operations
- Reduced operating minima



ALICIA System – holistic approach

- Integrated cockpit HMI
- Communication
- Navigation
- Surveillance
- Integrated situational awareness

All Condition Operations – Themes & Challenges

A. ACO - Airspace Operations

- Flight plan management
- Flight path trajectory guidance (route conformance)
- Vision augmentation (EVO)
- Approach & Landing
- En-route

B. ACO - Aerodrome Operations

- Surface manoeuvre guidance
- Position awareness
- Vision augmentation (EVO)

C. Integrated Situational Awareness / Decision Making

- Traffic conflict – detection, alerting and flight path resolution
- Atmospheric conflict – detection, alerting and flight path resolution
- Terrain & Obstacle conflict – detection and alerting
- Surface conflict - detection and alerting



Cockpit HMI - Technological Themes

A. *Crew Performance*

- Integrated cockpit workstation; design optimisation, situational awareness, balanced workload
- Reduced crew requirements

B. *Cockpit Architecture Philosophy*

- Display management; eyes-in & eyes-out
- Alert management
- Aircraft system management; HMI formats

C. *Through Life Costs*

- Virtual control panels
- Scalability
- Commonality

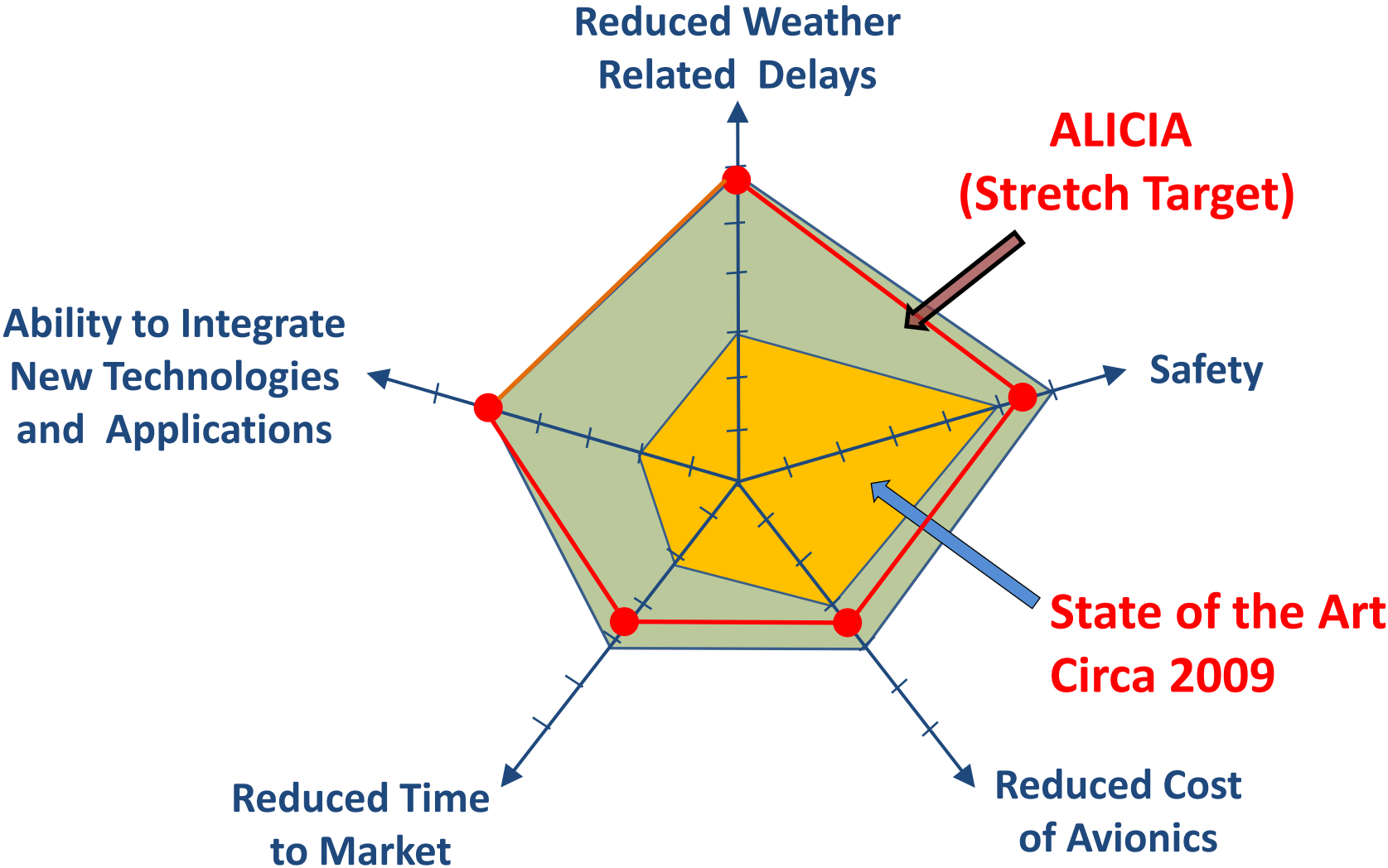


Concept Evaluation Testing

- Integrated system & technology concept evaluations
 - Rotorcraft Cockpit Demonstrator
 - Fixed-wing Cockpit Demonstrator
 - Taxi operation – precise positioning subsystem demonstrator
 - Taxi operation – improved vision subsystem demonstrator
- Part task concept evaluations
 - Virtual reality cockpit rig
 - Advanced FMS subsystem rig
 - Autonomous Taxi subsystem rig



Business Context – Targets & Progress



Contribution to Framework Programme 7

- The ALICIA output – economic perspective
 - Benefits to citizens – development of safer & smarter European transport systems
 - Innovation-based sustainable growth - getting Europe out of the current economic crisis
 - Technological advantage - competitive globally
 - Creation of high-value goods and services
 - Building the skills necessary for future European aerospace industry
- The ALICIA output – social and community perspective
 - Co-operation – cross-industry
 - Building relationships beyond the EU
 - Encouraging regional excellence in innovation
 - Strengthening economic, social and territorial cohesion

