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The SJU is a Public Private Partnership (PPT)

- 2 FOUNDING MEMBERS
- EUR 2.1 bio
- 15 other members
- 13 associate partners = 110 companies in total
- 20+ countries
- 3000 people working on SESAR
- 300+ projects
Background

• Almost 1,000 civil RPAS operators legally flying RPAS in the EU MS.... But fragmented activity

• RPAS need to adapt to ATM to avoid segregation - Not the other way around – Just another airspace user

• Integrate operational improvements addressing RPAS operations into the ATM Master Plan and its roadmaps
Rationale

• Safe integration of RPAS operations into the European civil airspace system from 2016

• Non-segregated ATM environments

• SES/SESAR Compliant – Likely to become an integrated part of the current SESAR Programme (by 2015) and SESAR 2020
Identification of gaps in the operational and technical domains led to the following topics:

- DAA (Detect & Avoid)
- Human factors
- C2 (Command & Control)
- SESAR compliance
- Contingency
- Security
R&D and REG are interdependent:

- Most of the requirements for RPAS integration, in short terms, are regulatory requirements:
  - On safety (airworthiness, C2/C3, ...)
  - On interoperability

- There are also potential new requirements on insurance, liability and privacy protection (cf. SESAR RPAS Definition Phase)
SESAR On-going work

• 9 RPAS Demonstration Projects – live trials using existing technology/procedures
• Liaison with FAA and ICAO
• WPE Projects
• SESAR RPAS Definition Phase:
  • Launch of a call for a RPAS Definition Phase Study (end of Jan. 2014)
  • Beginning of the Study in May
  • Last deliverable in March 2015
• See more SESAR public web site – Procurement
  • http://www.sesarju.eu/sites/default/files/documents/procurements/Ex-ante_information_Definition_Phase_study_RPAS.pdf
Nine “RPAS Demonstration Projects”, which include integrated pre-operational flight trials activities, have been selected.
Projects' Objectives

- Demonstrate how to integrate RPAS into non-segregated airspace in a multi-aircraft flight environment, with the purpose of exploring the feasibility of integration within the wider aviation community by 2016;

- Focus on concrete results filling the operational and technical gaps identified for RPAS integration into non-segregated airspace; and

- Capitalise on the SESAR delivery approach by providing synergies, risk and opportunities, with the overall SESAR programme.
Stakeholders in key locations in Europe

- Coordinator
- Air Operator
- ANSP
### Project description

**RPAS.01 - DEMORPAS**  
*Demonstration Activities for Integration of RPAS in SESAR*

- In-flight exercises in mixed ATM environment, airport landing and take-off procedures and also in En route phase of flight.
- Emergency procedures tests
- Procedures for RPAS flying in the mixed ATM, the airport landing and take-off procedures, impact on human operators, technical evaluation of the communications in order to establish if feasible to be used in mixed airspace

**RPAS.02 - INSuRE**  
*Integration into non-segregated ATM*

- Flight trials and technology based on CPDLC, ADS-B and TCAS
- Strong implication of the ANSP
- Close coordination between the RPAS operator and Air traffic Control services.
- Extensive demonstration activities through two campaigns (simulation and in-flight)

**RPAS.03 - RAID**  
*RPAS ATM Integration Demonstration*

- Maturity, compatibility and limitations of tested D&A and C2L technologies together with
- Human Factors impact of RPAS flights in non-segregated airspace on the RPAS pilot and ATCOs
- Distributed simulation flight trails undertaken between Italy and Malta and a range of live flight trials in Maltese airspace
- Recommendations and guidelines to fill technology and operational gaps

### Coordinator and Partners

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<th>Coordinator</th>
<th>Partners</th>
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| ISDEFE (SP) | AENA (SP)  
INTA (SP)  
CRIDA (SP)  
FADA-CATEC (SP) |
| IDS SpA (IT) | Sistemi Dinamici S.p.A. (IT)  
Air Navigation Services of the Czech Republic (CZ) |
| CIRA (IT) | DEEP BLUE (IT)  
NEXTANT (IT)  
NIMBUS (IT)  
UNIVERSITY OF MALTA  
MATS (MT) |
### Project description

**RPAS.04 - MedALE**  
*Mediterranean ATM Live Exercise*  
- Gap analysis between existing RPAS capabilities and those required for RPAS insertion into non-segregated airspace.  
- Distributed networked simulation between the ANSP and a range of MALE, Tactical and Light RPAS, leading on to live mixed traffic (RPAS/manned aircraft) campaign utilizing a flexibly configured MALE RPAS to demonstrate cooperative systems from Decimomannu (IT Air Force Base)

**RPAS.05 - TEMPAERIS**  
*Testing Emergency Procedures in Approach and En Route Integration Simulation*  
- 8 test scenarios, 5 of which with live flight trials, and 3 real-time simulation trials demonstration scenarios in approach area using adapted RPAS procedures, illustration and quantification of the impact of RPAS traffic on non-segregated areas on controller workload, ATC constraints on RPAS, nominal and degraded situations (radio, command and control loss)  
- In-flight demonstrations will take place at Bordeaux-Merignac airport using the optionally piloted vehicle

**RPAS.06 - ODREA**  
*Operational Demonstration of RPAS in European Airspace*  
- Simulations in an OPV mode or RPA mode.  
- Features like optronic and Infra-red sensors will be tested to demonstrate detect and avoid capabilities.  
- 2 flight trial campaigns will be performed to demonstrate ATC track accuracy including C2 link loss procedures and on Detect and Avoid concept.

### Coordinator

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RPAS.07 – CLAIRE
Civil Airspace Integration of RPAS in Europe

Project description
- 4-D trajectory information exchange between ATCO and RPAS operator and RPAS air vehicle,
- Effects of the RPAS in mixed traffic environment on the workload of ATCOs
- Defining the effect of flight of multiple and future RPAS on airspace capability & identifying existing limitations on the flight of RPAS in non-segregated airspace,
- Alternative RPAS-specific interoperable surveillance, communications and navigation solutions
- Watchkeeper RPAS usage in the demonstration activities

Coordinator
THALES UK (UK)
NATS (UK)
NLR (NL)

Partners

RPAS.08 - AIRICA
ATM Innovative RPAS Integration for Coastguard Applications

Project description
- A realistic coastguard operation previously completed by manned aircraft involving three different airspace environments (CTR, En-route and low level flight)
- In-flight demonstration performed by a OPV ‘FALCON’ autogyro RPAS will fly low level BLOS operations in non-segregated airspace over the sea from De Kooy airport, using a D&A system employing Mode S and ADS-B

Coordinator
NLR (NL)
Netherlands Coastguards (NL)
Glaesmann System (DE)
Royal Netherlands Air Force (NL)

Partners

RPAS.09 - ARIADNA
Activities on RPAS Integration Assistance and Demonstration for operations in Non-segregated Airspace

Project description
- Satellite based augmentation systems (SBAS) approach and landing procedures
- A ground based situational awareness system (GBSAS) by using ADS-B technology and “real-time” air traffic information provided by an automated ATC system

Coordinator
Indra Sistemas (SP)
AENA (SP)
CRIDA (SP)
FADA (SP)

Partners

FROM INNOVATION TO SOLUTION
MAIN OBJECTIVE: Ensure the safe execution of a RPAS flight using a Detect and Avoid system compatible with existing safety nets. Controller situational awareness will be improved by providing the remote pilots with a display presenting the same information the Air Traffic Controllers have in their Controller Working Position. Ultimately the project will demonstrate how to integrate into non-segregated airspace in a multi-aircraft flight environment, in order to explore the feasibility of integration with the wider aviation community by 2016.

VALIDATION APPROACH: Three types of exercises with 2 types of short range fully remotely piloted small aircrafts (SIVA, ALO) and 1 optionally piloted: STEMME S15) will be performed.

TYPE OF RPAS: Small short range and mid-range RPAS

LOCATION: Spain – Logroño Airdrome

PROJECT ENDS: October 2015

Kick-off meeting 22.10.2013
**MAIN OBJECTIVE:** Ensure safe execution of a RPAS flight using a D&A system compatible with existing safety nets and operating procedures. Trajectories will be exchanged with ATC taking into consideration the latencies and uncertain trajectory basis for RPAS operations; Satellite-Based Augmentation System (SBAS) based approach & landing of RPAS in aerodrome and Concepts for a RPAS Ground-based situational awareness system (GBSAS) will be used.

**VALIDATION APPROACH:** Flight trials and simulations on a fully unmanned helicopter INDRA Pelicano.

**TYPE OF RPAS:** Rotary wing

**PROJECT ENDS:** October 2015

**PARTNERS:**

![Partner Logos]

**LOCATION:** Spain

Kick-off meeting 24.10.2013
RPAS Definition Phase

• Refine essential R&D activities to enable the integration in the aviation system, as of 2016 and beyond - aligned with SESAR timeframe
• Identify globally interoperable and harmonised ATM requirements and enablers in terms of performance requirements
• A R&D and validation programme outline
• A high level implementation timeline, including costs and priorities
• Identification of the necessary work to support the alignment of the legislative, financial and regulatory frameworks allowing deployment
Thanks for your attention