



H2020-SESAR-2016-2

WA 1: Exploratory Research

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Founding Members



EUROPEAN UNION



EUROCONTROL

Topics in H2020-SESAR-2016-2

Work Area 1: Exploratory Research	Sub-Work Area 1.1 Transversal Activities	ER03-01 KTN
	Sub-Work Area 1.2 Applications-Oriented Research	ER03-02 Separation Management ER03-03 TBO ER03-04 CNS for GA ER03-05 CNS ER03-06 ATM Architecture
Work Area 2: Very Large Scale Demonstrations (VLD)	Sub-Work Area 2.1 Solutions for High Performing Aviation	VLD1-01 AMAN VLD1-02 Integrated Airport Operations VLD1-03 NCM VLD1-04 Initial Trajectory Information Sharing VLD1-05 Efficient Services and Infrastructure VLD1-06 Increased access to airport in low visibility mixed fleet
	Sub-Work Area 2.2. Global Interoperability	VLD1-07 Satellite based EPP CNS trajectory and queue management extended to Oceanic/Inter-continental VLD1-08 SWIM B2B applications for improved trajectories
	Sub-Work Area 2.3 Integration of All Vehicles	VLD1-09 GA and RC Solutions VLD1-10 Safe Integration of Drones

SESAR 2020 exploratory research: main principles



Builds on **results and positive outcomes** of **SESAR 1** ER research;

Acts as a driver for **innovative and disruptive** research ideas;

- Feeds the **SESAR innovation pipeline**;
- Encourages **scientific excellence** and the development of a highly skilled ATM work-force.



Strengthen links between ATM
research community & SESAR
stakeholders, engaging end-users and
delivering and communicating results



Exploratory research calls: Planning

“ER-1”: Published 2015

ATM excellent science & outreach and
ATM applications oriented research

“ER-2”: Published 2016

Remotely-piloted aircraft systems (RPAS)
in very low-level (VLL) drone operations

“ER-3”: This Call (ER aspects)

Transversal activities, including knowledge
transfer networks (KTN) and ATM
applications oriented topics

“ER-4”: Planned 2018

Further ATM excellent science & outreach
and ATM applications oriented research



H2020 open calls: not limited to SJU Members

ER-3 SESAR 2020 Exploratory Research



WA 1: Exploratory Research

In this Work Area, there are 2 sub Work Areas covering 6 topics:

- Sub Work Area 1.1: Transversal exploratory research activities
- Sub Work Area 1.2: Application-oriented research

Sub Work Area 1.1:

Transversal Exploratory Research Activities



It includes one topic (SESAR-ER3-01-2016) that shall establish an overarching view across ATM Exploratory Research, providing a coordinated exchange of research knowledge across a wide range of relevant themes. Within the context of this networking, it is expected to help in further stimulating the Future ATM Skilled work-force for ATM.

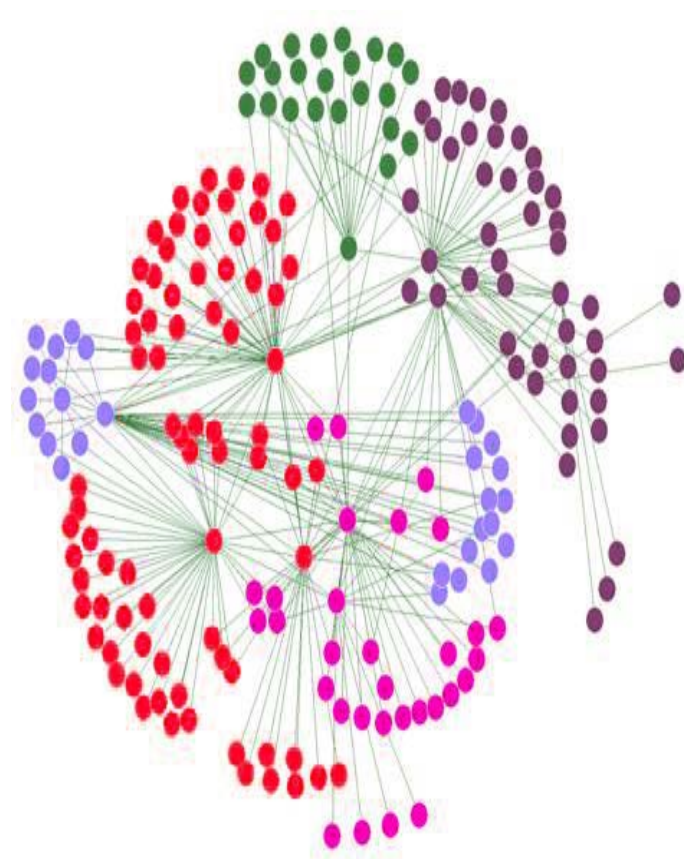
The SJU is looking to award one project, with a maximum duration of 4 years.

Creating an inclusive European ATM research area

Support the SJU by focussing on the **assessment, transfer, communication and sharing of research results** among the ATM community.

Support and encourage **collaborative research** on future and emerging innovative ideas, expertise and knowledge for the benefit of the future evolution of the European ATM system and its people.

Include the organisation and management of **interdisciplinary or 'themed' network activities** and **PhD research activities** based around key ATM research subjects



SESAR2020 Scientific Committee

New Scientific Committee forms an important part of SESAR governance.

Made up of independent experts with experience and expertise across the ATM research domain

Not only limited to ER but advises on all scientific matters

Links with the Scientific Committee will be a natural part of the network responsibility, but managed through the SJU.



Topic ER03-01: Knowledge Transfer Network



The Knowledge Transfer Network shall cover:

Communication – organisation of workshops and symposiums, ATM research summer schools, the development of newsletters and other actions aimed at the dissemination and sharing of SESAR exploratory research results.

Observatory and roadmap – monitoring, identification and analysis of new opportunities for innovative ATM research of relevance to the evolution of the European ATM system and the development of a long-term roadmap development of innovative and interdisciplinary ATM concepts beyond SESAR 2020.

Take-up – stimulate the transfer of exploratory research results towards ATM applications-oriented research and onwards towards industrial research.

Future ATM Skilled work-force – supports European ATM education and training in the ATM Community to develop new talent with a deep knowledge of the future ATM scientific research needs (includes support for PhDs)

Support to SJU initiatives – support the organisation of the SESAR Innovation Days research conference and the SESAR Young Scientist Award.

Sub Work Area 2.2:

Applications-Oriented Research

General Principles (applicable to all five topics):

- Expected to provide input to Industrial Research (IR)
- Proposals should formulate hypothesis for new Operational Improvement and/or Technological Enabler with rationale
- And describe how project would conduct initial validation
- Objective of the project should be to provide evidence to either:
 - Confirm hypothesis and provide recommendation to include the operational improvement and/or technological enabler in the Master Plan and further progress concept in IR; or
 - Reject hypothesis and potentially identify alternative options

Topic ER3-02: Separation Management

Propose and test new operational improvement: Separation conditions under which separation minima can be reduced

Topic not aimed specifically at RPAS, but RPAS not excluded either

Not addressing collision avoidance, but collision risk-modelling is expected

Wake encounter risk-modelling is also expected

Examples of potential research areas:

- TBS beyond the scope of SESAR solution 64 (TBS on final approach)
- Combined separation minima (horizontal + vertical)
- Reduced minima for aircraft on a PBN route

Topic ER03-03: Trajectory Based Operations

Propose and test new operational improvement: A specific process or metric for using trajectory data for improving prediction of traffic demand

Proposal can be for a new enabler to be used to support an existing operational (e.g. improved network trajectory prediction to support existing STAMs) – this can be considered new operational improvement

Examples of potential research areas:

- Use of continuous and automatic monitoring of post-operations data to identify patterns and use of this intelligence for improving predictions
- Novel metrics for assessing complexity of a flight list
- New tools for the Short Term ATFM Measure (STAM) tool-box (e.g. to limit complexity or bound uncertainty)
- Reference Business Trajectory (RBT) modification for reducing complexity
- Innovative dynamic sectorization processes

Topic ER03-04: CNS for General Aviation

Target is lower-end of the capability → looking for low-cost devices

Bid should propose new operational improvement with enabler.

Project should address both the technological aspects and the following non-technological aspects:

- How the technology would be used? (New OI and initial assessment of its ATM operational benefit)
- Human Performance aspects and their impact on safety (information overload?)
- Standardisation, certification and regulation
- Spectrum management

Examples of potential research areas:

- COM: Use of 3G,4G and/or 5G networks for up-linking aeronautical and MET information during the flight
- NAV: Affordable INS systems to be used as GNSS back-up, use of alternative signals (signals of opportunity) for NAV integrity, novel alternative PNT,...
- SUR: Use of low-cost ADS-B transponders

Topic ER03-05: CNS

Projects may research new ENs and/or new OIs.

Examples of potential technological research areas:

- New ways of combining existing ground and airborne equipment for enhanced CNS capabilities
- New COM: high-bandwidth for ATM (must include consideration of cybersecurity)
- New NAV: alternative PNT, transition from barometric to geometric altimetry for collision avoidance
- New SUR: Performance-Based Surveillance (beyond its consideration in the IR programme), future role of non-cooperative surveillance with global coverage
- New Operational Improvement: Consideration of the impact on separation provision of improved NAV accuracy (better than declared RNP performance)

Topic ER03-06: ATM Architecture, performance and validation

Projects must propose new enabler related to ATM system design service-oriented architecture (using clean-sheet approach or proposing evolution from current system).

The following aspects must be addressed:

- Harmonization requirements
- Transition aspects (and their cost)
- Security threats (includes both cybersecurity and physical security)

Research may consider:

- Impact of loose/tight connection between subsystems
- Agility, scalability, adaptability
- How to promote the harmonization required by the proposed architecture element (e.g. regulation, incentives, EC grants,...)





Thank you for your attention!



Founding Members



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