

Project reference: SESAR - Safe Integration of drones

Call Reference	SESAR-VLD1-10-2016
Submission Deadline	May 11, 2017
Project type	Innovation Action
Funding rate	70% funded for profit entities ; 100% funded for non-profit entities
Estimated Duration	24 to 36 months
Estimated Budget	not defined yet
Estimated TRL (initial – final)	TRL3 to TRL7
If funded, estimated project started date	about January 2018

Project Description:

Demonstration activities for identifying **quick-win** solutions enabling the safe integration of drones, in all kinds of airspace. The project will address:

- Three representative demonstration scenario : long-range surveying, light-load movement and long-endurance surveying
- The capacity of the UAS to comply with the air regulations rules in rural, suburban and urban locations
- The operation permissions and verification processing including e-identification/registration, surveillance and tracking, automatic flight permissions and flight plan validation, through a web-based ground segment

The project will focus transversally on data integrity all along the operational processing in order to guarantee data viability and to monitor operations requirements compliancy from the proposed solutions, through a deviations risk analysis.

Finally, the project will also outcome the technical and regulations gaps that need to be further addressed beyond TRL7 in order to satisfy the business deployment objective through quick-win solutions.

Current consortium:

Coordinator: a French mid-cap able to cover &/or to support on the following tasks:

- Operational concept and use cases definition for the considered scope (long range surveying, light-load movement and long-endurance surveying)
- Operational and functional analysis , safety hazards identification and safety assessment from operational to functional and system/equipment levels
- Ground station concept for drones based on a prototype with fleet management features

- Critical functions (embedded or not) definition and systems architecture design: Detect & Avoid, geofencing, communication systems/datalink, energy storage/generation/distribution, flight control,...
- Cybersecurity on the whole chain
- Tests and demonstration including Test plan, test coverage and test results summary as well as technical aspects such as flight tests systems installation and qualification procedures
- Human factors transverse appreciation and inherent risk analysis
- Integration in airspace from the operations and regulations requirements to the technical capabilities and operational procedures implementation.
- Route to certification overall analysis derivation to functional and technical specification
- Support to Operations (logistic, maintainability, manuals edition...)
- Project management (administrative, legal and financial follow-up, project plan, meetings ...)

Partner Search:

Expected type of partner (SME, Large Company, Research Centre...):

Expected competences:

The consortium is looking for the above competencies from:

- **SME or Research centre responsible for the supply of drones systems platform for tests and demonstrations :**
 - Fixed-wing configuration: for long-range surveying or long-endurance surveying in VLL, VFR or IFR
 - Either multicopter or fixed wing configurations : BVLOS for light-load movement
- **SME or large company experienced in drones' operations implementation risk analysis or used to flight operations principles with significant background in drone certification issues with regard to operational deployment.** This entity will be responsible for identifying the functional, technical and regulations gaps to be filled for the benefit of regular operations which, as much as possible, will not require exceptional or ad-hoc task to be performed (in case of impossibility to mitigate discrete cases, recommendations/guidelines will have to be produced to automate the process as much as possible). The main activity will consist in defining the most automated process proposal with regard to the above mentioned use cases. Hence use cases analysis shall also be part of the described activities proposal.
- **SME or large company specialized in communication systems (satellite and datalink) and/or communication services providers (3G/4G/5G/LTE).** An ability to propose a policy with regard to cybersecurity issues and capability to specify derived technical proposals would be a differentiating plus that will be part of the technical scope of activities to be performed by this partner. If not experienced in cybersecurity, the communication systems specialized partner may suggest any alternative concept &/or propose a relevant partner that will handle the cybersecurity issues.
- **Large company or Research centre with Air traffic management specialized organization experienced in interfacing with Eurocontrol (or equivalent) and able to define flight procedures complying with the air regulations requirements that will to be validated jointly with relevant authorities with support from that company.** This company will be responsible

for interfacing with the air traffic control and air traffic management authorities representatives, thus requiring a sustainable contact network with the appropriate authorities and able to translate their demand into technical requirements and leading intermediate achievements reviews along the project schedule.

- **Research centre specialized in Human factors domain, preferably in aeronautical field**, able to support all actors of the consortium all along the development cycle, i.e. from requirements definition, design guidelines, solution review, tests analysis and to results characterization on the human factors axis. Those activities will be carried out transversally to the project, which means that the responsible partner shall be able to act during the early design phases until the final end to the project with various entities, partners and stakeholders, probably in various geographical localizations (partners and final-users premises).
- **SME specialized in web technologies, especially on the definition and management of multi-sources databases with diverse access rights policy management.** This company will be responsible for the identification and development of data processing from the initial source to their real-time management and display on the ground segment for all stakeholders requiring them. The partner shall be able to provide their project's colleagues with both hardware and software developments and a minimal "hot-line" support or equivalent in a relatively short-time frame at affordable or free cost (licencing included) for the development and demonstration purpose.
- **SME or research centre providing almost 'plug-and-play' Geofencing systems for the aeronautical domain, if possible with experience on drones' geofencing systems.** The entity will be responsible of both the embedded hardware as well as data signals processing from board to ground and the required material to follow the navigation data with capability of measuring accuracy level as well as identifying the deviations and their technical justifications.
- **SME or large company recognized as an embedded systems manufacturer and notably critical systems for autonomous flight: flight control, navigation, robotics/artificial intelligence.** The partner shall be able to define, design, develop and produce a prototype supporting the required functions for autonomous flight to be integrated in an Unmanned Aerial System, i.e. meaning with a reasonable weight in case of embedded system. Experience in drones or aeronautics or autonomous transportation system is mandatory. Proficiency in robotics and artificial intelligence would be a net plus.
- **SME or Large company or Research centre responsible for Communication and dissemination activities such as website design, implementation and maintenance,** dissemination material design and production, events organization and feedback post-analysis and finally project outcomes dissemination survey.
- **SME or large company with experience in Business implementation analysis with significant experience on innovation breakthrough &/or on aeronautical domain.** This company shall be able to survey potential competition as well as identifying and characterize gaps to deployment with regard to the economical drivers in a non-existing scope of operations (= new business models).

Business sector: Aeronautics and preferably with experience on UAS (drones)