Call: HORIZON-SESAR-2025-DES-IR-02
(Digital European Sky Industrial Research 02)

Topic: HORIZON-SESAR-2025-DES-IR-02-WA5-2

Type of Action: HORIZON-JU-RIA
(HORIZON JU Research and Innovation Actions)

Proposal number: 101288039

Proposal acronym: SPARTA

Type of Model Grant Agreement: HORIZON Lump Sum Grant

Table of contents

Proposal ID **101288039**

Acronym **SPARTA**

1 - General information

Fields marked * are mandatory to fill.

Topic	HORIZON-SESAR-2025-DES-IR-02-WA5-2	Type of Action	HORIZON-JU-RIA
Call	HORIZON-SESAR-2025-DES-IR-02	Type of Model Grant Agreement	HORIZON-AG-LS

Acronym SPARTA

Proposal title SPARTA — Space-ATM Real-Time Awareness

Note that for technical reasons, the following characters are not accepted in the Proposal Title and will be removed: < > " &

Duration in months 36

Free keywords *ECHO Phase 3 European Concept For Higher Altitude Operations HAO Service Provider concept Space Transport Operations New Entrants Supersonic Hypersonic Suborbital HAPS*

Abstract *

The development of an enhanced Network Real-time Monitoring Module and associated enhanced procedures and eventual enhanced supporting tools for the management of space-launch and higher-altitude operations at the level of the European ATM Network Manager (NM). It includes space and higher-altitude operations data integration (from Launch and Re-entry Operators (LRO), Launch and Re-entry site operators (LRSO), STM, Higher Altitude vehicle and site Operators with the NM and ATM), looking to generate, maintain and broadcast a full European network wide situational awareness picture. Note that this a continuation of ongoing research embedded in the SESAR 3 project ECHO 2, under the HORIZON-SESAR-2022-DES-IR-01 Call.

Remaining characters 1278

Has this proposal (or a very similar one) been submitted in the past 2 years in response to a call for proposals under any EU programme, including the current call? ○ Yes ◉ No

Please give the proposal reference or contract number.
Previously submitted proposals should be with either 6 or 9 digits.

Administrative forms

Proposal ID **101288039**

Acronym **SPARTA**

Declarations

Field(s) marked * are mandatory to fill.

1) We declare to have the explicit consent of all applicants on their participation and on the content of this proposal. *	☒
2) We confirm that the information contained in this proposal is correct and complete and that none of the project activities have started before the proposal was submitted (unless explicitly authorised in the call conditions). *	☒
3) We declare: - to be fully compliant with the eligibility criteria set out in the call - not to be subject to any exclusion grounds under the EU Financial Regulation 2018/1046 - to have the financial and operational capacity to carry out the proposed project. *	☒
4) We acknowledge that all communication will be made through the Funding & Tenders Portal electronic exchange system and that access and use of this system is subject to the Funding & Tenders Portal Terms and Conditions. *	☒
5) We have read, understood and accepted the Funding & Tenders Portal Terms & Conditions and Privacy Statement that set out the conditions of use of the Portal and the scope, purposes, retention periods, etc. for the processing of personal data of all data subjects whose data we communicate for the purpose of the application, evaluation, award and subsequent management of our grant, prizes and contracts (including financial transactions and audits). *	☒
6) We declare that the proposal complies with ethical principles (including the highest standards of research integrity as set out in the ALLEA European Code of Conduct for Research Integrity, as well as applicable international and national law, including the Charter of Fundamental Rights of the European Union and the European Convention on Human Rights and its Supplementary Protocols. Appropriate procedures, policies and structures are in place to foster responsible research practices, to prevent questionable research practices and research misconduct, and to handle allegations of breaches of the principles and standards in the Code of Conduct. *	☒
7) We declare that the proposal has an exclusive focus on civil applications (activities intended to be used in military application or aiming to serve military purposes cannot be funded). If the project involves dual-use items in the sense of Regulation 2021/821, or other items for which authorisation is required, we confirm that we will comply with the applicable regulatory framework (e.g. obtain export/import licences before these items are used). *	☒
8) We confirm that the activities proposed do not - aim at human cloning for reproductive purposes; - intend to modify the genetic heritage of human beings which could make such changes heritable (with the exception of research relating to cancer treatment of the gonads, which may be financed), or - intend to create human embryos solely for the purpose of research or for the purpose of stem cell procurement, including by means of somatic cell nuclear transfer. - lead to the destruction of human embryos (for example, for obtaining stem cells) These activities are excluded from funding. *	☒
9) We confirm that for activities carried out outside the Union, the same activities would have been allowed in at least one EU Member State. *	☒
10) For Lump Sum Grants with a detailed budget table: We understand and accept that the EU lump sum grants must be reliable proxies for the actual costs of a project and confirm that the detailed budget for the proposal has been established in accordance with our usual cost accounting practices and in compliance with the basic eligibility conditions for EU actual cost grants (see AGA - Annotated Grant Agreement, art 6) and exclude costs that are ineligible under the Programme. Purchases and subcontracting costs must be done taking into account best value for money and must be free of conflict of interest. *	☒

The coordinator is only responsible for the information relating to their own organisation. Each applicant remains responsible for the information declared for their organisation. If the proposal is retained for EU funding, they will all be required to sign a declaration of honour.

False statements or incorrect information may lead to administrative sanctions under the EU Financial Regulation.

2 - Participants

List of participating organisations

#	Participating Organisation Legal Name	Country	Role	Action
1	EUROCONTROL - EUROPEAN ORGANISATION FOR THE SAI	BE	Coordinator	
2	DFS DEUTSCHE FLUGSICHERUNG GMBH	DE	Partner	
3	DEUTSCHES ZENTRUM FUR LUFT - UND RAUMFAHRT EV	DE	Partner	
4	LUFTFARTSVERKET	SE	Partner	
5	ENAV SPA	IT	Partner	
6	NATS (EN ROUTE) PUBLIC LIMITED COMPANY	UK	Partner	
7	ENAIRE	ES	Partner	
8	Europe Space Centre GmbH	Germany	Partner	
9	ENTE NAZIONALE PER L'AVIAZIONE CIVILE - ENAC ITALIAN	IT	Partner	
10	SkyNav Europe	BE	Partner	
11	ECOLE NATIONALE DE L AVIATION CIVILE	FR	Partner	
12	LINKOPINGS UNIVERSITET	SE	Partner	
13	C.I.R.A. CENTRO ITALIANO RICERCHE AEROSPAZIALI SCPA	IT	Partner	
14	SCEYE SPAIN S.L.	ES	Partner	
15	INTERNATIONAL FEDERATION OF AIR TRAFFIC CONTROLL	CA	Partner	
16	OpenUTM Ltd.	IE	Partner	
17	THALES LAS FRANCE SAS	FR	Partner	
18	ANRA TECHNOLOGIES UK LTD	UK	Partner	
19	HAPS Alliance	United States	Associated	

Organisation data

PIC	Legal name
999483733	*EUROCONTROL - EUROPEAN ORGANISATION FOR THE SAFETY OF AIR NAVIGATION*

Short name: EUROCONTROL

Address

Street	Rue de la Fusée 96
Town	BRUXELLES
Postcode	1130
Country	Belgium
Webpage	www.eurocontrol.int

Specific Legal Statuses

Legal person	yes
Public body	yes
Non-profit	yes
International organisation	yes
Secondary or Higher education establishment	no
Research organisation	yes

SME Data

Based on the below details from the Participant Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

SME self-declared status	14/02/2022 - no
SME self-assessment	unknown
SME validation	unknown

Departments carrying out the proposed work

Department 1

Department name	Aviation Transformation Directorate	☐ not applicable
	☒ Same as proposing organisation's address	
Street	Rue de la Fusée 96	
Town	BRUXELLES	
Postcode	1130	
Country	Belgium	

Department 2

Department name	Netrok Manager Directorate	☐ not applicable
	☒ Same as proposing organisation's address	
Street	Rue de la Fusée 96	
Town	BRUXELLES	
Postcode	1130	
Country	Belgium	

Links with other participants

Type of link	Participant

Main contact person

This will be the person the EU services will contact concerning this proposal (e.g. for additional information, invitation to hearings, sending of evaluation results, convocation to start grant preparation). The data in blue is read-only. Details (name, first name and e-mail) of Main Contact persons should be edited in the step "Participants" of the submission wizard.

Title Mr

Gender ○ Woman ◉ Man ○ Non Binary

First name* **Ovidiu**

Last name* **DUMITRACHE**

E-Mail* **ovidiu.dumitrache@eurocontrol.int**

Position in org. Senior Manager Research Strategy

Department Aviation Transformation Directorate

☐ Same as organisation name

☒ Same as proposing organisation's address

Street Rue de la Fusée 96

Town BRUXELLES

Post code 1130

Country Belgium

Website www.eurocontrol.int

Phone +32 2 729 30 52

Phone 2 *+xxx xxxxxxxxx*

Other contact persons

First Name	Last Name	E-mail	Phone
CM Team	EUROCONTROL	atd.ppu.cmt@eurocontrol.int	+xxx xxxxxxxxx
Pablo	HARO	pablo.haro@eurocontrol.int	+xxx xxxxxxxxx
Dragos	TONEA	dragos.tonea@eurocontrol.int	+xxx xxxxxxxxx
Fiona	MULLAN	fiona.mullan@eurocontrol.int	+xxx xxxxxxxxx

Researchers involved in the proposal

Title	First Name	Last Name	Gender	Nationality	E-mail	Career Stage	Role of researcher (in the project)	Reference Identifier	Type of identifier
Mr	Ovidiu	Dumitrache	Man	Romania	ovidiu.dumitrache@eurocontrol.int	Category B Senior resea	Leading		
Mr	Dragos	Tonea	Man	Romania	dragos.tonea@eurocontrol.int	Category B Senior resea	Leading		
Mr	Pablo	Haro	Man	Spain	pablo.haro@eurocontrol.int	Category B Senior resea	Team member		
Mr	Octavian	Fota	Man	Romania	octavian.fota@eurocontrol.int	Category B Senior resea	Team member		
Mr	Stefano	Tiberia	Man	Italy	stefano.tiberia@eurocontrol.int	Category B Senior resea	Team member		
Mrs	Marta	Fernandez Castrillo	Woman	Spain	marta.fernandez-castrillo@eurocontrol.int	Category C Recognised	Team member		
Mr	Augustin	Udristioiu	Man	Romania	augustin.udristioiu@eurocontrol.int	Category C Recognised	Team member		
Mr	Edgar	Reuber	Man	Germany	edgar.reuber@eurocontrol.int	Category C Recognised	Team member		
Mr	Gabor	Fugedi	Man	Hungary	gabor.fugedi@eurocontrol.int	Category C Recognised	Team member		
Mrs	Fiona	Mullan	Woman	Ireland	fiona.mullan@eurocontrol.int	Category D First stage r	Team member		
Mrs	Lucia	Sandu	Woman	Moldova	lucia.sandu@eurocontrol.int	Category D First stage r	Team member		
Mrs	Aleksandra	Owoc-Berson	Woman	Poland	aleksandra.owoc-berson@eurocontrol.int	Category D First stage r	Team member		

Role of participating organisation in the project

Project management	☒
Communication, dissemination and engagement	☒
Provision of research and technology infrastructure	☒
Co-definition of research and market needs	☐
Civil society representative	☐
Policy maker or regulator, incl. standardisation body	☐
Research performer	☒
Technology developer	☐
Testing/validation of approaches and ideas	☒
Prototyping and demonstration	☒
IPR management incl. technology transfer	☐
Public procurer of results	☐
Private buyer of results	☐
Finance provider (public or private)	☐
Education and training	☐
Contributions from the social sciences or/and the humanities	☐
Other If yes, please specify: (Maximum number of characters allowed: 50)	☐

List of up to 5 publications, widely-used datasets, software, goods, services, or any other achievements relevant to the call content.

Type of achievement	Short description (Max 500 characters)
Other achievement	*As a founding member of the SESAR Programme and Joint Undertaking, EUROCONTROL has been involved in all the phases (Definition, Development and Deployment) contributing significantly to many of its most important achievements, such as the definition and maintenance of the European ATM Master Plan, the SESAR 3 Strategic Research and Innovation Agenda and a large number of Solutions delivered in the context of the SESAR 1 and SESAR 2020.*
Dataset	*The EUROCONTROL Base of Aircraft Data (BADA) Aircraft Performance Model (APM) is a globally recognized reference database containing aircraft-specific coefficients and theoretical models used to calculate aircraft performance parameters.*
Service	*The EUROCONTROL Network Manager Operations Centre (NMOC) permanently monitors the airspace capacity against traffic load. This allows us to have an accurate picture of the current and expected European ATM network situation. To ensure the transparent and efficient operation of the network, we collect all of the real-time data generated by the network and share it with all operational partners through our Data Collection and Distribution Services (DCS and DDS).*
Service	*At the EUROCONTROL NMOC we measure, investigate and report on operational processes and activities throughout all domains relevant to Air Traffic Flow and Capacity Management. All stakeholders provide feedback on the efficiency of the flight planning and airspace data processing. We compare forecasts with the actual measured outcome in terms of delay and route extension, while taking into account performance targets. This helps us improve the performance of the European ATM Network.*

List of up to 5 most relevant previous projects or activities, connected to the subject of this proposal.

Name of Project or Activity	Short description (Max 500 characters)
ECHO 2 project (Ref 101114697)	*ECHO-2 is building on the deliverables of the ECHO (European Concept of Higher airspace Operations) project, starting from the Concept of Operations, to propose validated solutions paving the way towards the operational integration of HAO in ATM.*
ECHO project (ref. SESARER4-19-2019)	*The ECHO (European Concept of Higher airspace Operations) Project aimed at delivering a comprehensive demand analysis and a comprehensive, innovative and feasible Concept of Operations enabling near term and future Higher Airspace operations in a safe and orderly manner.*

Description of any significant infrastructure and/or any major items of technical equipment, relevant to the proposed work.

Name of infrastructure of equipment	Short description (Max 300 characters)
NMVP	*Validation platform allowing to design and validate solutions for Network Management in a more flexible way. Validations can now be replayed across NM's backend systems (Enhanced Tactical Flow Management System, Integrated Initial Flight Plan Processing System) and the front-end systems.*

Gender Equality Plan

Does the organization have a Gender Equality Plan (GEP) covering the elements listed below? (•) Yes ( ) No

Minimum process-related requirements (building blocks) for a GEP

- **Publication:** formal document published on the institution's website and signed by the top management
- **Dedicated resources:** commitment of human resources and gender expertise to implement it.
- **Data collection and monitoring:** sex/gender disaggregated data on personnel (and students for establishments concerned) and annual reporting based on indicators.
- **Training:** Awareness raising/trainings on gender equality and unconscious gender biases for staff and decision-makers.
- **Content-wise, recommended areas** to be **covered** and addressed via concrete measures and targets are:
    - work-life balance and organisational culture;
    - gender balance in leadership and decision-making;
    - gender equality in recruitment and career progression;
    - integration of the gender dimension into research and teaching content;
    - measures against gender-based violence including sexual harassment.

PIC	Legal name
999936820	*DFS DEUTSCHE FLUGSICHERUNG GMBH*

Short name: DFS

Address

Street	AM DFS CAMPUS 10
Town	LANGEN
Postcode	63225
Country	Germany
Webpage	www.dfs.de

Specific Legal Statuses

Legal person	yes
Public body	no
Non-profit	no
International organisation	no
Secondary or Higher education establishment	no
Research organisation	no

SME Data

Based on the below details from the Participant Registry the organisation is unknown (small- and medium-sized enterprise) for the call.

SME self-declared status	unknown
SME self-assessment	unknown
SME validation	unknown

Departments carrying out the proposed work

No department involved

Department name *Name of the department/institute carrying out the work.*

☒ not applicable

☐ Same as proposing organisation's address

Street *Please enter street name and number.*

Town *Please enter the name of the town.*

Postcode *Area code.*

Country *Please select a country*

Links with other participants

Type of link	Participant

Main contact person

This will be the person the EU services will contact concerning this proposal (e.g. for additional information, invitation to hearings, sending of evaluation results, convocation to start grant preparation). The data in blue is read-only. Details (name, first name and e-mail) of Main Contact persons should be edited in the step "Participants" of the submission wizard.

Title Mr

Gender ○ Woman ◉ Man ○ Non Binary

First name* **Andreas**

Last name* **UDOVIC**

E-Mail* **andreas.udovic@dfs.de**

Position in org. Project Manager

Department Operational Planing

☐ Same as organisation name

☒ Same as proposing organisation's address

Street AM DFS CAMPUS 10

Town LANGEN

Post code 63225

Country Germany

Website www.dfs.de

Phone +49610370705758

Phone 2 *+xxx xxxxxxxxx*

Other contact persons

First Name	Last Name	E-mail	Phone
Alexander	SEYBOLD	alexander.seybold@dfs.de	+49610370702034
Oliver	ALBERT	oliver.albert@dfs.de	+4961037072073

Researchers involved in the proposal

Title	First Name	Last Name	Gender	Nationality	E-mail	Career Stage	Role of researcher (in the project)	Reference Identifier	Type of identifier

Role of participating organisation in the project

Project management	☒
Communication, dissemination and engagement	☒
Provision of research and technology infrastructure	☐
Co-definition of research and market needs	☐
Civil society representative	☐
Policy maker or regulator, incl. standardisation body	☐
Research performer	☐
Technology developer	☐
Testing/validation of approaches and ideas	☒
Prototyping and demonstration	☐
IPR management incl. technology transfer	☐
Public procurer of results	☐
Private buyer of results	☐
Finance provider (public or private)	☐
Education and training	☐
Contributions from the social sciences or/and the humanities	☐
Other If yes, please specify: (Maximum number of characters allowed: 50)	☐

List of up to 5 publications, widely-used datasets, software, goods, services, or any other achievements relevant to the call content.

Type of achievement	Short description (Max 500 characters)
Publication	• *Presentation of „Obelisk“ auf den Kongress „HAPS4ESA Workshop“, 12-14.02.2024, Leiden*
Publication	• *Article: Obelisk - Operationelles Betriebskonzept zur sicheren und effizienten Luftraumintegration von Stratosphärenplattformen, DFS-Zeitschrift „Innovation im Fokus“ publication in preparation for 2025 foreseen*

List of up to 5 most relevant previous projects or activities, connected to the subject of this proposal.

Name of Project or Activity	Short description (Max 500 characters)
OBELISK	• *German national founded projetct „Obelisk Operationelles Betriebskonzept zur sicheren und effizienten Luftraumintegration von Stratosphärenplattformen“ 2019-2024*
ECHO2	• *Participation on „ECHO 2 European Concept für High Altitude Operations 2” 2023-2026*

Description of any significant infrastructure and/or any major items of technical equipment, relevant to the proposed work.

Name of infrastructure of equipment	Short description (Max 300 characters)

Gender Equality Plan

Does the organization have a Gender Equality Plan (GEP) covering the elements listed below? ○ Yes ◉ No

Minimum process-related requirements (building blocks) for a GEP

- **Publication:** formal document published on the institution's website and signed by the top management
- **Dedicated resources:** commitment of human resources and gender expertise to implement it.
- **Data collection and monitoring:** sex/gender disaggregated data on personnel (and students for establishments concerned) and annual reporting based on indicators.
- **Training:** Awareness raising/trainings on gender equality and unconscious gender biases for staff and decision-makers.
- **Content-wise, recommended areas** to be **covered** and addressed via concrete measures and targets are:
    - work-life balance and organisational culture;
    - gender balance in leadership and decision-making;
    - gender equality in recruitment and career progression;
    - integration of the gender dimension into research and teaching content;
    - measures against gender-based violence including sexual harassment.

Administrative forms

PIC	Legal name
999981731	*DEUTSCHES ZENTRUM FUR LUFT - UND RAUMFAHRT EV*

Short name: DLR

Address

Street	LINDER HOHE
Town	KOLN
Postcode	51147
Country	Germany
Webpage	www.dlr.de

Specific Legal Statuses

Legal person	yes
Public body	no
Non-profit	yes
International organisation	no
Secondary or Higher education establishment	no
Research organisation	yes

SME Data

Based on the below details from the Participant Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

SME self-declared status	03/01/2022 - no
SME self-assessment	unknown
SME validation	28/10/2008 - no

Departments carrying out the proposed work

Department 1

Department name	Institut of Flight Guidance	☐ not applicable
	☐ Same as proposing organisation's address	
Street	Lilienthalplatz 7	
Town	Braunschweig	
Postcode	38108	
Country	Germany	

Links with other participants

Type of link	Participant

Main contact person

This will be the person the EU services will contact concerning this proposal (e.g. for additional information, invitation to hearings, sending of evaluation results, convocation to start grant preparation). The data in blue is read-only. Details (name, first name and e-mail) of Main Contact persons should be edited in the step "Participants" of the submission wizard.

Title Mr

Gender ○ Woman ◉ Man ○ Non Binary

First name* **Sven**

Last name* **KALTENHAEUSER**

E-Mail* **sven.kaltenhaeuser@dlr.de**

Position in org. Head of Department ATM-SIM

Department Institut of Flight Guidance

☐ Same as organisation name

☐ Same as proposing organisation's address

Street Lilienthalplatz 7

Town Braunschweig

Post code 38108

Country Germany

Website dlr.de/fl

Phone +49 531 295 2560

Phone 2 *+xxx xxxxxxxxx*

Other contact persons

First Name	Last Name	E-mail	Phone
Lorenz	LOSENSKY	lorenz.losensky@dlr.de	+49 531 295 1155
Dirk-Roger	SCHMITT	dirk-roger.schmitt@dlr.de	+49 172 295 4416
Andreas	HASSELBERG	andreas.hasselberg@dlr.de	+49 531 295 2427
fl	controlling	fl-controlling@dlr.de	+xxx xxxxxxxxx

Researchers involved in the proposal

Title	First Name	Last Name	Gender	Nationality	E-mail	Career Stage	Role of researcher (in the project)	Reference Identifier	Type of identifier
Mr	Richard	Hörder	Man	Germany	richard.hoerder@dlr.de	Category D First stage r	Team member		Orcid ID
Mr	Jens	Hampe	Man	Germany	Jens.Hampe@dlr.de	Category B Senior resea	Team member	0000-0003-3105-1516	Orcid ID
Mr	Frank	Morlang	Man	Germany	Frank.Morlang@dlr.de	Category B Senior resea	Team member	0000-0003-3636-5215	Orcid ID
Mr	Maximilian	Neumann	Man	Germany	Maximilian.Neumann@dlr.de	Category D First stage r	Team member		Orcid ID
Mr	Tobias	Rabus	Man	Germany	tobias.rabus@dlr.de	Category D First stage r	Team member	0000-0003-1947-5447	Orcid ID
Mr	Lorenz	Losensky	Man	Germany	lorenz.losensky@dlr.de	Category D First stage r	Team member	0000-0002-8762-1971	Orcid ID
Mr	Sven	Kaltenhäuser	Man	Germany	sven.kaltenhaeuser@dlr.de	Category B Senior resea	Leading	0000-0003-2085-7979	Orcid ID

Role of participating organisation in the project

Project management	☒
Communication, dissemination and engagement	☒
Provision of research and technology infrastructure	☒
Co-definition of research and market needs	☐
Civil society representative	☐
Policy maker or regulator, incl. standardisation body	☐
Research performer	☒
Technology developer	☒
Testing/validation of approaches and ideas	☒
Prototyping and demonstration	☐
IPR management incl. technology transfer	☐
Public procurer of results	☐
Private buyer of results	☐
Finance provider (public or private)	☐
Education and training	☐
Contributions from the social sciences or/and the humanities	☐
Other If yes, please specify: (Maximum number of characters allowed: 50)	☐

List of up to 5 publications, widely-used datasets, software, goods, services, or any other achievements relevant to the call content.

Type of achievement	Short description (Max 500 characters)
Publication	*Kaltenhäuser, Sven und Klünker, Carmo und Schmitt, Dirk-Roger (2022) Interoperable data exchange for safe and efficient launch and re-entry operations in an international environment, In: Proceedings of the International Astronautical Congress, IAC. 73rd International Astronautical Congress (IAC), 18.-22. Okt. 2022, Paris, France*
Publication	*Stahnke, Anouk und Rabus, Tobias und Kaltenhäuser, Sven (2022) Supporting the safety and efficiency of airspace transition for launch and re-entry operations in Europe, 2nd International Conference on Flight Vehicles, Aerothermodynamics and Re-entry Missions & Engineering (FAR), 19 - 23 June 2022. Heilbronn, Germany*
Publication	*Kaltenhäuser, Sven und Stilwell, Ruth (2020) NearSpace operations – barrier between aviation and space or the path to integration? 6th Annual Space Traffic Management Conference, 19.-20. Feb. 2020, Austin, USA*
Publication	*Kaltenhäuser, Sven (2019) Towards a NearSpace Operation Management. In: Proceedings of the International Astronautical Congress, IAC. 70th International Astronautical Congress (IAC), 21.-25. Okt. 2019, Washington D.C., USA*
Publication	*Kaltenhäuser, Sven und Hampe, Jens und Rabus, Tobias und Morlang, Frank und Losensky, Lorenz (2024) Towards Efficient Integration of Rocket Launches and Re-entry Operations in European Airspace: Development and Testing of a Launch Coordination Center. Hampe, Jens und Stahnke, Anouk (2024) Improving air and space safety through enhanced coordination with the SpaceTracks Suite microservice architecture. Journal of Space Safety Engineering. Elsevier. doi: 10.1016/j.jsse.2024.01.005. ISSN 2468-8967.*

List of up to 5 most relevant previous projects or activities, connected to the subject of this proposal.

Name of Project or Activity	Short description (Max 500 characters)
ECHO Project	*European Concept of Higher Airspace Operations.* *https://higherairspace.eu/echo-project/* *Project led by EUROCONTROL with major DLR participation delivering a comprehensive demand analysis and the concept of operations (ConOps) for higher airspace to allow safe, efficient and scalable operations.The ConOps also provide the basis to identify future infrastructure needs that is required to support Higher Airspace Operations (HAO).*
DLR/FAA DEP	*DLR - FAA Data Exchange Project.* *https://www.dlr.de/content/en/articles/news/2019/04/20191025_dlr-and-us-federal-aviationadministration-are-cooperating.html* *DLR and the Office of Commercial Space Transportation of the US Federal Aviation Administration (FAA) identified the data that need to be exchanged between United States and European Air Navigation Service Providers (ANSPs) prior to, during and after a launch.*
ECHO2	*https://higherairspace.eu/echo2-project/* *The ECHO 2 Project is dedicated to enhancing air traffic management by integrating space mission monitoring for launches and re-entries within the EUROCONTROL Network Manager area. It focuses on creating operational frameworks to manage space operations, including orbital and sub-orbital trajectories, ensuring they harmonize with existing air traffic.*
DLR Launch Coordination Center (LCC) Development -	*https://www.dlr.de/en/latest/news/2021/03/20210923_dlr-is-developing-a-launch-coordination-center* *DLR's LCC ntegrates software-based procedures for safe, efficient space launch coordination through airspace. System includes automated planning components, real-time mission monitoring via Space Operations Dashboard, and enhanced air traffic controller interfaces.*

Description of any significant infrastructure and/or any major items of technical equipment, relevant to the proposed work.

Name of infrastructure of equipment	Short description (Max 300 characters)
Air Traffic Validation Center	*https://www.dlr.de/fl/en/desktopdefault.aspx/tabid-1140/* *DLR facilities for the validation of concepts, technologies and procedures in air traffic management. Together, these facilities are known as the Air Traffic Validation Center and are unique in Europe.*

Gender Equality Plan

Does the organization have a Gender Equality Plan (GEP) covering the elements listed below? (•) Yes ( ) No

Minimum process-related requirements (building blocks) for a GEP

- **Publication:** formal document published on the institution's website and signed by the top management
- **Dedicated resources:** commitment of human resources and gender expertise to implement it.
- **Data collection and monitoring:** sex/gender disaggregated data on personnel (and students for establishments concerned) and annual reporting based on indicators.
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    - gender balance in leadership and decision-making;
    - gender equality in recruitment and career progression;
    - integration of the gender dimension into research and teaching content;
    - measures against gender-based violence including sexual harassment.

PIC	Legal name
942346077	*LUFTFARTSVERKET*

Short name: SWEDISH CIVIL AVIATION ADMINISTRATION

Address

Street	HOSPITALSGATAN 30
Town	NORRKOPING
Postcode	602 27
Country	Sweden
Webpage	http://www.lfv.se

Specific Legal Statuses

Legal person	yes
Public body	yes
Non-profit	yes
International organisation	no
Secondary or Higher education establishment	no
Research organisation	no

SME Data

Based on the below details from the Participant Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

SME self-declared status	20/03/2014 - no
SME self-assessment	unknown
SME validation	unknown

Departments carrying out the proposed work

Department 1

Department name	LFV Research and Innovation	☐ not applicable
	☒ Same as proposing organisation's address	
Street	HOSPITALSGATAN 30	
Town	NORRKOPING	
Postcode	602 27	
Country	Sweden	

Links with other participants

Type of link	Participant

Main contact person

This will be the person the EU services will contact concerning this proposal (e.g. for additional information, invitation to hearings, sending of evaluation results, convocation to start grant preparation). The data in blue is read-only. Details (name, first name and e-mail) of Main Contact persons should be edited in the step "Participants" of the submission wizard.

Title: Ms

Gender: (•) Woman ( ) Man ( ) Non Binary

First name*: **Lindsay**

Last name*: **MARTENEZ-HERMOSILLA**

E-Mail*: **lindsey.martenez-hermosilla@lfv.se**

Position in org.: LFV SESAR Programme- and Contribution Manager

Department: LUFTFARTSVERKET ☒ Same as organisation name

☒ Same as proposing organisation's address

Street: HOSPITALSGATAN 30

Town: NORRKOPING

Post code: 602 27

Country: Sweden

Website: www.lfv.se

Phone: +46 721 429 192

Phone 2: *+xxx xxxxxxxxx*

Other contact persons

First Name	Last Name	E-mail	Phone
Stefan	SIGGELIN	stefan.siggelin@lfv.se	+xxx xxxxxxxxx

Researchers involved in the proposal

Title	First Name	Last Name	Gender	Nationality	E-mail	Career Stage	Role of researcher (in the project)	Reference Identifier	Type of identifier

Role of participating organisation in the project

Project management	☐
Communication, dissemination and engagement	☐
Provision of research and technology infrastructure	☐
Co-definition of research and market needs	☐
Civil society representative	☐
Policy maker or regulator, incl. standardisation body	☐
Research performer	☒
Technology developer	☐
Testing/validation of approaches and ideas	☒
Prototyping and demonstration	☐
IPR management incl. technology transfer	☐
Public procurer of results	☐
Private buyer of results	☐
Finance provider (public or private)	☐
Education and training	☐
Contributions from the social sciences or/and the humanities	☐
Other If yes, please specify: (Maximum number of characters allowed: 50)	☐

List of up to 5 publications, widely-used datasets, software, goods, services, or any other achievements relevant to the call content.

Type of achievement	Short description (Max 500 characters)

List of up to 5 most relevant previous projects or activities, connected to the subject of this proposal.

Name of Project or Activity	Short description (Max 500 characters)
SESAR IR1 ECHO2	*The SESAR IR1 ECHO2 project was built on the deliverables of the ECHO (European Concept of Higher airspace Operations) project. LFV participated in ECHO2 withc ATCO expertise, both with the Concept of Operations, but also as active participants of the project EXE.*

Description of any significant infrastructure and/or any major items of technical equipment, relevant to the proposed work.

Name of infrastructure of equipment	Short description (Max 300 characters)
LFV Research and Innovation Centre	*Located at ATCC Malmö, the LFV R&D Centre is equipped with lab, simulators, and conference facilities, and is capable of conducting human-in-the-loop simulations and demonstrations. The available simulators include NARSIM (for ACC, APP, and TWR), the SAAB RTS simulator, and the UTM City platform.*

Gender Equality Plan

Does the organization have a Gender Equality Plan (GEP) covering the elements listed below? (•) Yes ( ) No

Minimum process-related requirements (building blocks) for a GEP

- **Publication:** formal document published on the institution's website and signed by the top management
- **Dedicated resources:** commitment of human resources and gender expertise to implement it.
- **Data collection and monitoring:** sex/gender disaggregated data on personnel (and students for establishments concerned) and annual reporting based on indicators.
- **Training:** Awareness raising/trainings on gender equality and unconscious gender biases for staff and decision-makers.
- **Content-wise, recommended areas** to be **covered** and addressed via concrete measures and targets are:
    - work-life balance and organisational culture;
    - gender balance in leadership and decision-making;
    - gender equality in recruitment and career progression;
    - integration of the gender dimension into research and teaching content;
    - measures against gender-based violence including sexual harassment.

PIC	Legal name
998197513	*ENAV SPA*

Short name: ENAV

Address

Street	VIA SALARIA 716
Town	ROMA
Postcode	00138
Country	Italy
Webpage	www.enav.it

Specific Legal Statuses

Legal person	yes
Public body	no
Non-profit	no
International organisation	no
Secondary or Higher education establishment	no
Research organisation	no

SME Data

Based on the below details from the Participant Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

SME self-declared status	28/08/2008	- yes
SME self-assessment	unknown	
SME validation	28/08/2008	- no

Departments carrying out the proposed work

Department 1

Department name	Engineering and Infrastructures	☐ not applicable
	☐ Same as proposing organisation's address	
Street	Via Appia Nuova 1491	
Town	Rome	
Postcode	00178	
Country	Italy	

Links with other participants

Type of link	Participant

Main contact person

This will be the person the EU services will contact concerning this proposal (e.g. for additional information, invitation to hearings, sending of evaluation results, convocation to start grant preparation). The data in blue is read-only. Details (name, first name and e-mail) of Main Contact persons should be edited in the step "Participants" of the submission wizard.

Title Ms

Gender (•) Woman ( ) Man ( ) Non Binary

First name* **Ramona**

Last name* **SANTARELLI**

E-Mail* **ramona.santarelli@enav.it**

Position in org. ATM Researcher

Department Innovation and Research

☐ Same as organisation name

☐ Same as proposing organisation's address

Street Via Pietro Boccanelli, 32/34

Town Rome

Post code 00138

Country Italy

Website www.enav.it

Phone +39 06 81664013

Phone 2 *+xxx xxxxxxxxx*

Other contact persons

First Name	Last Name	E-mail	Phone
Daniele	Teotino	daniele.teotino@enav.it	+39 06 81662364
Angela	Iurilli	angela.iurilli@enav.it	+39 06 81664411

Researchers involved in the proposal

Title	First Name	Last Name	Gender	Nationality	E-mail	Career Stage	Role of researcher (in the project)	Reference Identifier	Type of identifier
Ms	Ramona	Santarelli	Woman	Italy	ramona.santarelli@enav.it	Category B Senior resea	Team member	EX2025D1106377	Researcher ID
Mrs	Marinella	Massari	Woman	Italy	marinella.massari@enav.it	Category B Senior resea	Team member		
Mrs	Debora	Palombi	Woman	Italy	debora.palombi@enav.it	Category B Senior resea	Team member		

Role of participating organisation in the project

Project management	☒
Communication, dissemination and engagement	☒
Provision of research and technology infrastructure	☐
Co-definition of research and market needs	☒
Civil society representative	☐
Policy maker or regulator, incl. standardisation body	☐
Research performer	☒
Technology developer	☐
Testing/validation of approaches and ideas	☐
Prototyping and demonstration	☐
IPR management incl. technology transfer	☐
Public procurer of results	☐
Private buyer of results	☐
Finance provider (public or private)	☐
Education and training	☐
Contributions from the social sciences or/and the humanities	☐
Other If yes, please specify: (Maximum number of characters allowed: 50)	☐

List of up to 5 publications, widely-used datasets, software, goods, services, or any other achievements relevant to the call content.

Type of achievement	Short description (Max 500 characters)
Publication	*Cleared 06/2020 "Space Traffic Management - La futura gestione del traffico aereo nello spazio". S. Romano, L. Brucculeri, ENAV, Italy*
Publication	*Cleared 02/2025 "Navigare nel futuro, l'ascesa delle Higher Airspace Operations". R. Santarelli, Federico Ferrari, ENAV, Italy*
Publication	*Aerospace 2019, 7, 24, "U-Space Concept of Operations: A Key Enabler for Opening Airspace to Emerging Low-Altitude Operations". Cristina Barrado, Mario Boyero, Luigi Brucculeri, Giancarlo Ferrara, Andrew Hately, Peter Hullah, David Martin-Marrero, Enric Pastor, Anthony Peter Rushton and Andreas Volkert .*

List of up to 5 most relevant previous projects or activities, connected to the subject of this proposal.

Name of Project or Activity	Short description (Max 500 characters)
SESAR3 ECHO2 European Concept for HAO Phase 2	*The project aimed to define new operating methods to support the safe, secure, and sustainable development of civil aviation operations taking place in higher airspace. The project developed three solutions for integrating higher airspace operations in the European ATM system, focusing on Space Real Time Mission Monitoring supporting Network Operations, and the integration of HAPS, Supersonic, Hypersonic and Suborbital Operations in European ATM.*
ECHO European Concept for HAO	*The ECHO (European Concept of Higher airspace Operations) Project delivered a comprehensive demand analysis and a comprehensive, innovative and feasible Concept of Operations enabling near term and future Higher Airspace operations in a safe and orderly manner.*

Description of any significant infrastructure and/or any major items of technical equipment, relevant to the proposed work.

Name of infrastructure of equipment	Short description (Max 300 characters)

Gender Equality Plan

Does the organization have a Gender Equality Plan (GEP) covering the elements listed below? ○ Yes ◉ No

Minimum process-related requirements (building blocks) for a GEP

- **Publication:** formal document published on the institution's website and signed by the top management
- **Dedicated resources:** commitment of human resources and gender expertise to implement it.
- **Data collection and monitoring:** sex/gender disaggregated data on personnel (and students for establishments concerned) and annual reporting based on indicators.
- **Training:** Awareness raising/trainings on gender equality and unconscious gender biases for staff and decision-makers.
- **Content-wise, recommended areas** to be **covered** and addressed via concrete measures and targets are:
    - work-life balance and organisational culture;
    - gender balance in leadership and decision-making;
    - gender equality in recruitment and career progression;
    - integration of the gender dimension into research and teaching content;
    - measures against gender-based violence including sexual harassment.

PIC	Legal name
997542763	*NATS (EN ROUTE) PUBLIC LIMITED COMPANY*

Short name: NATS

Address

Street	4000 PARKWAY WHITELEY
Town	FAREHAM
Postcode	PO15 7FL
Country	United Kingdom
Webpage	www.nats.aero

Specific Legal Statuses

Legal person	yes
Public body	no
Non-profit	no
International organisation	no
Secondary or Higher education establishment	no
Research organisation	no

SME Data

Based on the below details from the Participant Registry the organisation is unknown (small- and medium-sized enterprise) for the call.

SME self-declared status	unknown
SME self-assessment	unknown
SME validation	unknown

Departments carrying out the proposed work

Department 1

Department name	NATS (En Route) Public Limited Company (CTC)	☐ not applicable
	☒ Same as proposing organisation's address	
Street	4000 PARKWAY WHITELEY	
Town	FAREHAM	
Postcode	PO15 7FL	
Country	United Kingdom	

Links with other participants

Type of link	Participant

Main contact person

This will be the person the EU services will contact concerning this proposal (e.g. for additional information, invitation to hearings, sending of evaluation results, convocation to start grant preparation). The data in blue is read-only. Details (name, first name and e-mail) of Main Contact persons should be edited in the step "Participants" of the submission wizard.

Title Mr

Gender ○ Woman ◉ Man ○ Non Binary

First name* **Richard**

Last name* **HAYWARD**

E-Mail* **richard.hayward@nats.co.uk**

Position in org. Systems Engineer

Department NATS (En Route) Public Limited Company (CTC)

☐ Same as organisation name

☒ Same as proposing organisation's address

Street 4000 PARKWAY WHITELEY

Town FAREHAM

Post code PO15 7FL

Country United Kingdom

Website www.nats.aero

Phone *+xxx xxxxxxxxx*

Phone 2 *+xxx xxxxxxxxx*

Other contact persons

First Name	Last Name	E-mail	Phone
Richard	PUGH	richard.pugh@nats.co.uk	+447827954671
Alison	ROBERTS	alison.roberts@nats.co.uk	+447917558035
Matthew	GREEN	matthew.green@nats.co.uk	+xxx xxxxxxxxx
Patrick	GILES	patrick.giles@nats.co.uk	+xxx xxxxxxxxx

Researchers involved in the proposal

Title	First Name	Last Name	Gender	Nationality	E-mail	Career Stage	Role of researcher (in the project)	Reference Identifier	Type of identifier
Mr	Richard	Hayward	Man	United Kingdom	richard.hayward@nats.co.uk	Category C Recognised	Leading		
Mrs	Patrick	Giles	Man	United Kingdom	patrick.giles@nats.co.uk	Category B Senior resea	Team member		

Role of participating organisation in the project

Project management	☐
Communication, dissemination and engagement	☒
Provision of research and technology infrastructure	☐
Co-definition of research and market needs	☐
Civil society representative	☐
Policy maker or regulator, incl. standardisation body	☐
Research performer	☒
Technology developer	☐
Testing/validation of approaches and ideas	☒
Prototyping and demonstration	☐
IPR management incl. technology transfer	☐
Public procurer of results	☐
Private buyer of results	☐
Finance provider (public or private)	☐
Education and training	☐
Contributions from the social sciences or/and the humanities	☐
Other If yes, please specify: (Maximum number of characters allowed: 50)	☐

List of up to 5 publications, widely-used datasets, software, goods, services, or any other achievements relevant to the call content.

Type of achievement	Short description (Max 500 characters)
Other achievement	*Participation in SESAR ECHO 2 project, including leading the development of the OSED document for WP 2 - High Altitude Platform Systems.*
Service	*Operational support to UK Ministry of Defence / US Air Force in Europe with regard to current (military) high altitude operations.*
Service	*Past operational experience of operating very high / very fast commercial airliners undertaking inter-continental flights (Concorde).*
Service	*Operational and strategic coordination for UK-based Space Launches, including from Spaceport Cornwall (Newquay) and Shetland Space Centre (Saxa Vord).* *Coordination with European and Global stakeholders (including the Network Manager with regard to space debris (from launch or re-entry) identified as potentially passing through European airspace.*

List of up to 5 most relevant previous projects or activities, connected to the subject of this proposal.

Name of Project or Activity	Short description (Max 500 characters)
SESAR 3 ECHO 2	*The ECHO 2 project is further developing concepts identified in the initial ECHO Concept of Operations document. This work will be a key input to the SPARTA project as it is in the ECHO2 discussions that the need for the SPARTA project was identified.*

Description of any significant infrastructure and/or any major items of technical equipment, relevant to the proposed work.

Name of infrastructure of equipment	Short description (Max 300 characters)

Gender Equality Plan

Does the organization have a Gender Equality Plan (GEP) covering the elements listed below? (•) Yes ( ) No

Minimum process-related requirements (building blocks) for a GEP

- **Publication:** formal document published on the institution's website and signed by the top management
- **Dedicated resources:** commitment of human resources and gender expertise to implement it.
- **Data collection and monitoring:** sex/gender disaggregated data on personnel (and students for establishments concerned) and annual reporting based on indicators.
- **Training:** Awareness raising/trainings on gender equality and unconscious gender biases for staff and decision-makers.
- **Content-wise, recommended areas** to be **covered** and addressed via concrete measures and targets are:
    - work-life balance and organisational culture;
    - gender balance in leadership and decision-making;
    - gender equality in recruitment and career progression;
    - integration of the gender dimension into research and teaching content;
    - measures against gender-based violence including sexual harassment.

PIC	Legal name
997701843	*ENAIRE*

Short name: ENAIRE

Address

Street	AVENIDA DE ARAGON S/N BLOQUE 330, PORTAL
Town	MADRID
Postcode	28022
Country	Spain
Webpage	http://www.enaire.es

Specific Legal Statuses

Legal person	yes
Public body	yes
Non-profit	no
International organisation	no
Secondary or Higher education establishment	no
Research organisation	no

SME Data

Based on the below details from the Participant Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

SME self-declared status	14/06/1991 - no
SME self-assessment	unknown
SME validation	unknown

Departments carrying out the proposed work

Department 1

Department name	Innovation Division	☐ not applicable
	☒ Same as proposing organisation's address	
Street	AVENIDA DE ARAGON S/N BLOQUE 330, PORTAL	
Town	MADRID	
Postcode	28022	
Country	Spain	

Links with other participants

Type of link	Participant

Main contact person

This will be the person the EU services will contact concerning this proposal (e.g. for additional information, invitation to hearings, sending of evaluation results, convocation to start grant preparation). The data in blue is read-only. Details (name, first name and e-mail) of Main Contact persons should be edited in the step "Participants" of the submission wizard.

Title Mr

Gender ○ Woman ◉ Man ○ Non Binary

First name* **Francisco José**

Last name* **Jiménez Roncero**

E-Mail* **fjroncero@enaire.es**

Position in org. Head of Division

Department Innovation Division

☐ Same as organisation name

☒ Same as proposing organisation's address

Street AVENIDA DE ARAGON S/N BLOQUE 330, PORTAL 2 PARQUE EMPRESARIAL LAS

Town MADRID

Post code 28022

Country Spain

Website www.enaire.es

Phone +34 634 880 079

Phone 2 *+xxx xxxxxxxxx*

Other contact persons

First Name	Last Name	E-mail	Phone
Daniel	DOMINGUEZ	ddoperez@enaire.es	+xxx xxxxxxxxx
Javier	García Moreno	jgmoreno@enaire.es	+xxx xxxxxxxxx
Jorge	Vellón Benito	jvellon@e-externas.enaire.es	+xxx xxxxxxxxx

Researchers involved in the proposal

Title	First Name	Last Name	Gender	Nationality	E-mail	Career Stage	Role of researcher (in the project)	Reference Identifier	Type of identifier

Role of participating organisation in the project

Project management	☐
Communication, dissemination and engagement	☒
Provision of research and technology infrastructure	☐
Co-definition of research and market needs	☐
Civil society representative	☐
Policy maker or regulator, incl. standardisation body	☐
Research performer	☒
Technology developer	☐
Testing/validation of approaches and ideas	☒
Prototyping and demonstration	☒
IPR management incl. technology transfer	☐
Public procurer of results	☐
Private buyer of results	☐
Finance provider (public or private)	☐
Education and training	☐
Contributions from the social sciences or/and the humanities	☐
Other If yes, please specify: (Maximum number of characters allowed: 50)	☐

List of up to 5 publications, widely-used datasets, software, goods, services, or any other achievements relevant to the call content.

Type of achievement	Short description (Max 500 characters)

List of up to 5 most relevant previous projects or activities, connected to the subject of this proposal.

Name of Project or Activity	Short description (Max 500 characters)
EUSTM	*EUSTM is an end-to end activity towards the definition of a future STM capability:* *· Defining the needs in terms of organisation and responsibilities, technology, policy, laws, guidelines, best practices and standards* *· Elaborating detailed specs, a preliminary design, a reference roadmap and a ROM cost analysis* *· Developing an innovative collaborative platform for exchange of information inside the team and with external stakeholders* *Creating a community of interest on STM*
ECHO 2	*The main objective of this project is the modernisation and adaptation of the European ATM system that allows the integration of the so-called high-altitude operations or Higher Airspace Operations (HAO). These types of operations occur above flight level FL550, that is, operations above 17,000 meters, while flights usually take place around 10,000 meters.*

Description of any significant infrastructure and/or any major items of technical equipment, relevant to the proposed work.

Name of infrastructure of equipment	Short description (Max 300 characters)

Gender Equality Plan

Does the organization have a Gender Equality Plan (GEP) covering the elements listed below? (•) Yes ( ) No

Minimum process-related requirements (building blocks) for a GEP

- **Publication:** formal document published on the institution's website and signed by the top management
- **Dedicated resources:** commitment of human resources and gender expertise to implement it.
- **Data collection and monitoring:** sex/gender disaggregated data on personnel (and students for establishments concerned) and annual reporting based on indicators.
- **Training:** Awareness raising/trainings on gender equality and unconscious gender biases for staff and decision-makers.
- **Content-wise, recommended areas** to be **covered** and addressed via concrete measures and targets are:
    - work-life balance and organisational culture;
    - gender balance in leadership and decision-making;
    - gender equality in recruitment and career progression;
    - integration of the gender dimension into research and teaching content;
    - measures against gender-based violence including sexual harassment.

PIC	Legal name
870575583	*Europe Space Centre GmbH*

Short name: Europe Space Centre GmbH / SaxaVord

Address

Street	Willy-Messerschmitt-Str. 1
Town	Taufkirchen
Postcode	82024
Country	Germany
Webpage	

Specific Legal Statuses

Legal person	yes
Public body	no
Non-profit	no
International organisation	no
Secondary or Higher education establishment	no
Research organisation	no

SME Data

Based on the below details from the Participant Registry the organisation is an SME (small- and medium-sized enterprise) for the call.

SME self-declared status	16/07/2025 - yes
SME self-assessment	unknown
SME validation	unknown

Departments carrying out the proposed work

No department involved

Department name *Name of the department/institute carrying out the work.* ☒ not applicable

☐ Same as proposing organisation's address

Street *Please enter street name and number.*

Town *Please enter the name of the town.*

Postcode *Area code.*

Country *Please select a country*

Links with other participants

Type of link	Participant

Main contact person

This will be the person the EU services will contact concerning this proposal (e.g. for additional information, invitation to hearings, sending of evaluation results, convocation to start grant preparation). The data in blue is read-only. Details (name, first name and e-mail) of Main Contact persons should be edited in the step "Participants" of the submission wizard.

Title: Dr

Gender: (•) Woman ( ) Man ( ) Non Binary

First name*: **Paola**

Last name*: **BREDA**

E-Mail*: **paola.breda@shetlandspacecentre.com**

Position in org.: Launch Account Manager

Department: Europe Space Centre GmbH

☒ Same as organisation name

☒ Same as proposing organisation's address

Street: Willy-Messerschmitt-Str. 1

Town: Taufkirchen

Post code: 82024

Country: Germany

Website: *Please enter website*

Phone: +49 1732064728

Phone 2: *+xxx xxxxxxxxx*

Other contact persons

First Name	Last Name	E-mail	Phone
Jimmy	SLAUGHTER	james.slaughter@shetlandspacecentre.com	+xxx xxxxxxxxx

Researchers involved in the proposal

Title	First Name	Last Name	Gender	Nationality	E-mail	Career Stage	Role of researcher (in the project)	Reference Identifier	Type of identifier

Role of participating organisation in the project

Project management	☐
Communication, dissemination and engagement	☐
Provision of research and technology infrastructure	☒
Co-definition of research and market needs	☐
Civil society representative	☐
Policy maker or regulator, incl. standardisation body	☐
Research performer	☒
Technology developer	☐
Testing/validation of approaches and ideas	☐
Prototyping and demonstration	☒
IPR management incl. technology transfer	☐
Public procurer of results	☐
Private buyer of results	☐
Finance provider (public or private)	☐
Education and training	☐
Contributions from the social sciences or/and the humanities	☐
Other If yes, please specify: (Maximum number of characters allowed: 50)	☐

List of up to 5 publications, widely-used datasets, software, goods, services, or any other achievements relevant to the call content.

Type of achievement	Short description (Max 500 characters)
Other achievement	*Main PoC contributed to project ECHO2 REG and STAND deliverables (see project below).*

List of up to 5 most relevant previous projects or activities, connected to the subject of this proposal.

Name of Project or Activity	Short description (Max 500 characters)
ECHO2	*SaxaVord Spaceport is member of Advisory Board for SESAR project ECHO2 (ongoing). Paola Breda previously worked on WP1 of ECHO2 until December 2024 as she was employed at HyImpulse Technologies GmbH.*
RFA	*Providing launch services for integrated engine test and launch operations.*

Description of any significant infrastructure and/or any major items of technical equipment, relevant to the proposed work.

Name of infrastructure of equipment	Short description (Max 300 characters)
Range TT&C infrastructure	*Range services include telemetry and tracking capabilities. Data are transmitted by launch operators during early launch phase. It can be possible to share T&T data with the network module proposed in this project (RMM-2.0) to real-time data feed during launch, under consent of the launch operator.*

Gender Equality Plan

Does the organization have a Gender Equality Plan (GEP) covering the elements listed below? (•) Yes ( ) No

Minimum process-related requirements (building blocks) for a GEP

- **Publication:** formal document published on the institution's website and signed by the top management
- **Dedicated resources:** commitment of human resources and gender expertise to implement it.
- **Data collection and monitoring:** sex/gender disaggregated data on personnel (and students for establishments concerned) and annual reporting based on indicators.
- **Training:** Awareness raising/trainings on gender equality and unconscious gender biases for staff and decision-makers.
- **Content-wise, recommended areas** to be **covered** and addressed via concrete measures and targets are:
    - work-life balance and organisational culture;
    - gender balance in leadership and decision-making;
    - gender equality in recruitment and career progression;
    - integration of the gender dimension into research and teaching content;
    - measures against gender-based violence including sexual harassment.

PIC	Legal name
988366078	*ENTE NAZIONALE PER L'AVIAZIONE CIVILE - ENAC ITALIAN CIVIL AVIATION AUTHORITY*

Short name: ENAC IT

Address

Street	VIALE CASTRO PRETORIO 118
Town	ROMA
Postcode	00185
Country	Italy
Webpage	http://www.enac.gov.it

Specific Legal Statuses

Legal person	yes
Public body	yes
Non-profit	yes
International organisation	no
Secondary or Higher education establishment	no
Research organisation	no

SME Data

Based on the below details from the Participant Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

SME self-declared status	25/05/1997 - no
SME self-assessment	unknown
SME validation	unknown

Departments carrying out the proposed work

Department 1

Department name	Direzione Innovazione Tecnologica	☐ not applicable
	☒ Same as proposing organisation's address	
Street	VIALE CASTRO PRETORIO 118	
Town	ROMA	
Postcode	00185	
Country	Italy	

Links with other participants

Type of link	Participant

Main contact person

This will be the person the EU services will contact concerning this proposal (e.g. for additional information, invitation to hearings, sending of evaluation results, convocation to start grant preparation). The data in blue is read-only. Details (name, first name and e-mail) of Main Contact persons should be edited in the step "Participants" of the submission wizard.

Title Dr

Gender ◯ Woman ◉ Man ◯ Non Binary

First name* **Giovanni**

Last name* **Di ANTONIO**

E-Mail* **g.diantonio@enac.gov.it**

Position in org. Director

Department Direzione Innovazione Tecnologica

☐ Same as organisation name

☒ Same as proposing organisation's address

Street VIALE CASTRO PRETORIO 118

Town ROMA

Post code 00185

Country Italy

Website *Please enter website*

Phone 00390644596618

Phone 2 *+xxx xxxxxxxxx*

Other contact persons

First Name	Last Name	E-mail	Phone
Fabrizio	ARRU	f.arru@enac.gov.it	00390644596367
Alessandro	BUCCI	a.bucci@enac.gov.it	00390644596389

Researchers involved in the proposal

Title	First Name	Last Name	Gender	Nationality	E-mail	Career Stage	Role of researcher (in the project)	Reference Identifier	Type of identifier
Mr	Fabrizio	Arru	Man	Italy	f.arru@enac.gov.it	Category C Recognised	Team member		
Mr	Alessandro	Bucci	Man	Italy	a.bucci@enac.gov.it	Category C Recognised	Team member		
Mr	Giovanni	Di Antonio	Man	Italy	g.diantonio@enac.gov.it	Category A Top grade re	Leading		
Mr	Luigi	Morra	Man	Italy	l.morra@enac.gov.it	Category C Recognised	Team member		
Mr	Marco	Catalano	Man	Italy	m.catalano@enac.gov.it	Category C Recognised	Team member		

Role of participating organisation in the project

Project management	☐
Communication, dissemination and engagement	☐
Provision of research and technology infrastructure	☐
Co-definition of research and market needs	☐
Civil society representative	☐
Policy maker or regulator, incl. standardisation body	☒
Research performer	☐
Technology developer	☐
Testing/validation of approaches and ideas	☐
Prototyping and demonstration	☐
IPR management incl. technology transfer	☐
Public procurer of results	☐
Private buyer of results	☐
Finance provider (public or private)	☐
Education and training	☐
Contributions from the social sciences or/and the humanities	☐
Other If yes, please specify: (Maximum number of characters allowed: 50)	☐

List of up to 5 publications, widely-used datasets, software, goods, services, or any other achievements relevant to the call content.

Type of achievement	Short description (Max 500 characters)

List of up to 5 most relevant previous projects or activities, connected to the subject of this proposal.

Name of Project or Activity	Short description (Max 500 characters)
SESAR ECHO and ECHO2 projects	*ENAC was involved in the SESAR ECHO project, in which it contributed to drafting the original ECHO Concepts of Operations (CONOPS). Currently, ENAC is actively participating in the SESAR ECHO2 project, where it leads Solution 3, focused on integrating supersonic, hypersonic, and suborbital operations into the European ATM system.*
Italian National Regulation Activity on HAO/STO	*ENAC has already issued the Italian Regulation for the construction and use of spaceports, as well as the Italian Regulation for Suborbital and Access to Space Operations (SASO). ENAC is also developing a dedicated regulation for the airspace management of HAO and STO, aimed at ensuring the safe and efficient integration of these operations within Italian national airspace.*
EASA HAO Task Force and ICAO EUR STO Project Team	*ENAC plays a leading international role in regulatory frameworks for HAO and STO. It chairs the EASA HAO Task Force, driving the development of operational and regulatory standards. Additionally, ENAC leads the ICAO EUR STO project team, working to create harmonized guidelines for STO across the European region, promoting safe and efficient integration.*
ENAC-Virgin Galactic Technical Feasibility Study	*ENAC is engaged in a technical feasibility study, in collaboration with the USA operator Virgin Galactic, to assess the potential for suborbital operations at the Grottaglie spaceport in Italy. This study is pivotal to understanding the operational challenges and regulatory requirements associated with STO in a European context.*
ENAC-EUROCONTROL Simulation Activity	*ENAC has carried out simulation activities in partnership with Eurocontrol, validating operational procedures to enable the efficient and effective accommodation of suborbital and re-entry operations at the Grottaglie spaceport. These Real-Time Simulation (RTS) exercises, conducted at the Eurocontrol Innovation Hub (EIH) in Brétigny, France, involved air traffic controllers from both Italian civil and military service providers (ENAV and the Italian Air Force).*

Description of any significant infrastructure and/or any major items of technical equipment, relevant to the proposed work.

Name of infrastructure of equipment	Short description (Max 300 characters)

Gender Equality Plan

Does the organization have a Gender Equality Plan (GEP) covering the elements listed below? (•) Yes ( ) No

Minimum process-related requirements (building blocks) for a GEP

- **Publication:** formal document published on the institution's website and signed by the top management
- **Dedicated resources:** commitment of human resources and gender expertise to implement it.
- **Data collection and monitoring:** sex/gender disaggregated data on personnel (and students for establishments concerned) and annual reporting based on indicators.
- **Training:** Awareness raising/trainings on gender equality and unconscious gender biases for staff and decision-makers.
- **Content-wise, recommended areas** to be **covered** and addressed via concrete measures and targets are:
    - work-life balance and organisational culture;
    - gender balance in leadership and decision-making;
    - gender equality in recruitment and career progression;
    - integration of the gender dimension into research and teaching content;
    - measures against gender-based violence including sexual harassment.

PIC	Legal name
870906450	*SkyNav Europe*

Short name: SkyNav Europe

Address

Street	Rue Coppens 16
Town	Brussels
Postcode	1000
Country	Belgium
Webpage	www.skynavintl.com

Specific Legal Statuses

Legal person	yes
Public body	no
Non-profit	no
International organisation	no
Secondary or Higher education establishment	no
Research organisation	no

SME Data

Based on the below details from the Participant Registry the organisation is an SME (small- and medium-sized enterprise) for the call.

SME self-declared status	27/09/2024	- yes
SME self-assessment	27/09/2024	- yes
SME validation	unknown	

Departments carrying out the proposed work

No department involved

Department name *Name of the department/institute carrying out the work.*

☒ not applicable

☐ Same as proposing organisation's address

Street *Please enter street name and number.*

Town *Please enter the name of the town.*

Postcode *Area code.*

Country *Please select a country*

Links with other participants

Type of link	Participant

Main contact person

This will be the person the EU services will contact concerning this proposal (e.g. for additional information, invitation to hearings, sending of evaluation results, convocation to start grant preparation). The data in blue is read-only. Details (name, first name and e-mail) of Main Contact persons should be edited in the step "Participants" of the submission wizard.

Title: Mr

Gender: ○ Woman ◉ Man ○ Non Binary

First name*: **Ben**

Last name*: **KINGS**

E-Mail*: **ben.kings@skynavintl.com**

Position in org.: Managing Director/Owner

Department: SkyNav Europe

☒ Same as organisation name

☒ Same as proposing organisation's address

Street: Rue Coppens 16

Town: Brussels

Post code: 1000

Country: Belgium

Website: https://skynavintl.com/

Phone: +31615625092

Phone 2: *+xxx xxxxxxxxx*

Researchers involved in the proposal

Title	First Name	Last Name	Gender	Nationality	E-mail	Career Stage	Role of researcher (in the project)	Reference Identifier	Type of identifier
Mr	Ben	Kings	Man		ben.kings@skynavintl.com	Category A Top grade re	Leading		
Mr	Duncan	Auld	Man		duncan.auld@skynavintl.com	Category A Top grade re	Leading		
Mr	Zheng	Tao	Man		zheng.tao@skynavintl.com	Category B Senior resea	Team member		
Ms	Qina	Diao	Woman		qina.diao@skynavintl.com	Category B Senior resea	Team member		
Ms	Julie	Caraga	Woman		julie.caraga@skynavintl.com	Category D First stage r	Team member		

Role of participating organisation in the project

Project management	☒
Communication, dissemination and engagement	☒
Provision of research and technology infrastructure	☐
Co-definition of research and market needs	☒
Civil society representative	☐
Policy maker or regulator, incl. standardisation body	☒
Research performer	☒
Technology developer	☐
Testing/validation of approaches and ideas	☒
Prototyping and demonstration	☐
IPR management incl. technology transfer	☐
Public procurer of results	☐
Private buyer of results	☐
Finance provider (public or private)	☐
Education and training	☐
Contributions from the social sciences or/and the humanities	☐
Other If yes, please specify: (Maximum number of characters allowed: 50)	☐

List of up to 5 publications, widely-used datasets, software, goods, services, or any other achievements relevant to the call content.

Type of achievement	Short description (Max 500 characters)
Service	*ECHO2 subcontractor* *Participation in the ECHO2 consortium as a contractor focusing on higher airspace and space transport integration. Contributions include operational concept refinement, validation planning, stakeholder mapping, and alignment with ANSP procedures and Network functions. The work informs scalable approaches for trajectory management and airspace reservations. Includes project management and deliverable lead.*
Service	*Operational ATM experience* *Decades of global, operational Air Traffic Control experience across all ATC disciplines (Tower, Approach, Area, Oceanic) and at all function levels. Operational supervision, flow management, training, training management, safety and technical committee representation, operational procedure development, international cross-border negotiations, airspace design, safety risk assessments and environmental impact studies*
Service	*ICAO drafting and representation* *Contributed to drafting and review activities at ICAO in relation to Annex 11, Annex 10 and PANS-ATM material. Work includes requirements structuring, procedure text, and consistency checks across datasets and guidance, supporting globally harmonised ATM provisions relevant to STO and HAO integration. Leading working groups on ATM planning & implementation, development of Global ATM Operational Concept, development of Aviation System Block Upgrades*
Service	*State regulatory drafting and representation* *Several years of regulatory drafting support for a Gulf State authority, updating national civil aviation regulations, AMC/GM-style guidance and implementation procedures across ANS, operations and oversight. Emphasis on practicality, traceability and alignment with ICAO and regional provisions. Leadership of ICAO regional groups and task forces related to integration of space transport activities.*
Service	*Project Management & Leadership Expertise* *Extensive track record in project and organisational leadership, including executive roles within IFATCA (International Federation of Air Traffic Controllers' Associations). Demonstrated ability to manage complex international initiatives, coordinate diverse stakeholders, and oversee multi-million-euro budgets. Proven experience in steering strategic aviation projects, ensuring delivery of innovative outcomes aligned with European policy & industry need*

List of up to 5 most relevant previous projects or activities, connected to the subject of this proposal.

Name of Project or Activity	Short description (Max 500 characters)
SESAR ECHO / ECHO2 – HAO Integration	*Participation in ECHO and ECHO2 on higher airspace and space transport integration. Roles covered operational scenarios, requirements traceability, validation planning, stakeholder engagement and alignment with EUROCONTROL and ICAO practices for cross-border coordination and dynamic, minimal-impact airspace management.*
iNEO – Project Management Plan & Governance Appr.	*Development of a rigorous PMP and governance model for multi-partner R&D, covering schedule baselining, risk and compliance, quality assurance, and reporting. The approach underpins efficient WP coordination and is directly reusable for other HORIZON projects.*
UAE National Regulations Development Programme	*Regulatory drafting support for a Gulf State authority, updating national civil aviation regulations, AMC/GM-style guidance and implementation procedures across ANS, operations and oversight. Emphasis on practicality, traceability and alignment with ICAO and regional provisions.*

Description of any significant infrastructure and/or any major items of technical equipment, relevant to the proposed work.

Name of infrastructure of equipment	Short description (Max 300 characters)

Gender Equality Plan

Does the organization have a Gender Equality Plan (GEP) covering the elements listed below? (•) Yes ( ) No

Minimum process-related requirements (building blocks) for a GEP

- **Publication:** formal document published on the institution's website and signed by the top management
- **Dedicated resources:** commitment of human resources and gender expertise to implement it.
- **Data collection and monitoring:** sex/gender disaggregated data on personnel (and students for establishments concerned) and annual reporting based on indicators.
- **Training:** Awareness raising/trainings on gender equality and unconscious gender biases for staff and decision-makers.
- **Content-wise, recommended areas** to be **covered** and addressed via concrete measures and targets are:
    - work-life balance and organisational culture;
    - gender balance in leadership and decision-making;
    - gender equality in recruitment and career progression;
    - integration of the gender dimension into research and teaching content;
    - measures against gender-based violence including sexual harassment.

Administrative forms

PIC	Legal name
996375756	*ECOLE NATIONALE DE L AVIATION CIVILE*

Short name: ENAC FR

Address

Street	AVENUE EDOUARD BELIN 7
Town	TOULOUSE
Postcode	31400
Country	France
Webpage	www.enac.fr

Specific Legal Statuses

Legal person	yes
Public body	yes
Non-profit	yes
International organisation	no
Secondary or Higher education establishment	yes
Research organisation	yes

SME Data

Based on the below details from the Participant Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

SME self-declared status	27/05/2020 - no
SME self-assessment	unknown
SME validation	unknown

Departments carrying out the proposed work

Department 1

Department name: ENAC LAB ☐ not applicable

☒ Same as proposing organisation's address

Street: AVENUE EDOUARD BELIN 7

Town: TOULOUSE

Postcode: 31400

Country: France

Links with other participants

Type of link	Participant

Main contact person

This will be the person the EU services will contact concerning this proposal (e.g. for additional information, invitation to hearings, sending of evaluation results, convocation to start grant preparation). The data in blue is read-only. Details (name, first name and e-mail) of Main Contact persons should be edited in the step "Participants" of the submission wizard.

Title Mr

Gender ◯ Woman ◉ Man ◯ Non Binary

First name* **Georges**

Last name* **MYKONIATIS**

E-Mail* **georges.mykoniatis@enac.fr**

Position in org. Head of Business Development of ENACLAB

Department ENAC LAB

☐ Same as organisation name

☒ Same as proposing organisation's address

Street AVENUE EDOUARD BELIN 7

Town TOULOUSE

Post code 31400

Country France

Website *Please enter website*

Phone +33619911108

Phone 2 *+xxx xxxxxxxxx*

Other contact persons

First Name	Last Name	E-mail	Phone
Aurelie	PEAUD	aurelie.peuaud@enac.fr	+xxx xxxxxxxxx
Florence	LAPORTERIE-DEJEAN	florence.laporterie-dejean@enac.fr	+33562259509

Researchers involved in the proposal

Title	First Name	Last Name	Gender	Nationality	E-mail	Career Stage	Role of researcher (in the project)	Reference Identifier	Type of identifier
Mr	Georges	Mykoniatis	Man	France	georges.mykoniatis@enac.fr	Category B Senior resea	Leading	0000-0002-5550-579X	Orcid ID
Dr	Murat	Bronz	Man	France	murat.bronz@enac.fr	Category B Senior resea	Leading	0000-0002-1098-5240	Orcid ID
Dr	Rodolphe	Fremond	Man		rodolphe.fremond@enac.fr	Category D First stage r	Team member	0009-0008-1513-9597	Orcid ID

Role of participating organisation in the project

Project management	☒
Communication, dissemination and engagement	☒
Provision of research and technology infrastructure	☒
Co-definition of research and market needs	☐
Civil society representative	☐
Policy maker or regulator, incl. standardisation body	☐
Research performer	☒
Technology developer	☒
Testing/validation of approaches and ideas	☐
Prototyping and demonstration	☒
IPR management incl. technology transfer	☐
Public procurer of results	☐
Private buyer of results	☐
Finance provider (public or private)	☐
Education and training	☐
Contributions from the social sciences or/and the humanities	☐
Other If yes, please specify: (Maximum number of characters allowed: 50)	☐

List of up to 5 publications, widely-used datasets, software, goods, services, or any other achievements relevant to the call content.

Type of achievement	Short description (Max 500 characters)
Publication	*Elmira Fattahzadeh, G Mykoniatis. COOPERATIVE STRATEGIC DECONFLICTION FOR THE HIGHER AIRSPACE USERS. 9th International Conference on Experiments/Process/System Modeling/Simulation/Optimization, Jul 2021, Athens, Greece. ?hal-03320530?*
Publication	*A. Guitart, C. Demouge, D. Delahaye and E. Feron, "Multi Criteria Methodology for Aircraft Trajectory Planning Algorithm Selection: A Survey," in IEEE Transactions on Intelligent Transportation Systems, vol. 25, no. 10, pp. 12893-12911, Oct. 2024, doi: 10.1109/TITS.2024.3397331. keywords: {Aircraft;Trajectory;Air traffic control;Airports;Surveys;Planning;Aircraft navigation;Optimization;aircraft trajectory;selection methodology},*
Publication	*A. Guitart, D. Delahaye, F. M. Camino and E. Feron, "Collaborative Generation of Local Conflict Free Trajectories With Weather Hazards Avoidance," in IEEE Transactions on Intelligent Transportation Systems, vol. 24, no. 11, pp. 12831-12842, Nov. 2023, doi: 10.1109/TITS.2023.3289191. keywords: {Aircraft;Meteorology;Trajectory;Air traffic control;Collaboration;Aircraft navigation;Radar;Conflict;trajectory;collaborative approach;stormy areas},*
Publication	*R. Kallaka, J. Zhao, R. Fremond and A. Tsourdos, "Hierarchical Reinforcement Learning for Multi-Objective UAV Routing Considering Operational Complexities," 2025 Integrated Communications, Navigation and Surveillance Conference (ICNS), Brussels, Belgium, 2025, pp. 1-13, doi: 10.1109/ICNS65417.2025.10976917. keywords: {Visualization;Navigation;Surveillance;Scalability;Reinforcement learning;Traffic control;Strategic planning;Routing;Autonomous aerial vehicles;Optimization;Multi-Objective Optimisa*
Publication	*Badea, C. A., Morfin Veytia, A., Vidosavljević, A., Ellerbroek, J., & Hoekstra, J. (2025). Very-low-level U-space Conflict Detection and Resolution: Focused Developments, Analysis, and Future Prospects. Journal of Open Aviation Science, 3(1). https://doi.org/10.59490/joas.2025.7921*

List of up to 5 most relevant previous projects or activities, connected to the subject of this proposal.

Name of Project or Activity	Short description (Max 500 characters)
ECHO	*European Concept of Higher Airspace Operations - SESAR A concept of operations (ConOps) for higher airspace https://higherairspace.eu/echo-project/*
ECHO 2	*Towards the integration between ATM and Higher Altitude Operations - SESAR https://higherairspace.eu/echo2-project/*

Description of any significant infrastructure and/or any major items of technical equipment, relevant to the proposed work.

Name of infrastructure of equipment	Short description (Max 300 characters)

Gender Equality Plan

Does the organization have a Gender Equality Plan (GEP) covering the elements listed below? (•) Yes ( ) No

Minimum process-related requirements (building blocks) for a GEP

- **Publication:** formal document published on the institution's website and signed by the top management
- **Dedicated resources:** commitment of human resources and gender expertise to implement it.
- **Data collection and monitoring:** sex/gender disaggregated data on personnel (and students for establishments concerned) and annual reporting based on indicators.
- **Training:** Awareness raising/trainings on gender equality and unconscious gender biases for staff and decision-makers.
- **Content-wise, recommended areas** to be **covered** and addressed via concrete measures and targets are:
    - work-life balance and organisational culture;
    - gender balance in leadership and decision-making;
    - gender equality in recruitment and career progression;
    - integration of the gender dimension into research and teaching content;
    - measures against gender-based violence including sexual harassment.

PIC	Legal name
999852236	*LINKOPINGS UNIVERSITET*

Short name: LIU

Address

Street	CAMPUS VALLA
Town	LINKOPING
Postcode	581 83
Country	Sweden
Webpage	www.liu.se

Specific Legal Statuses

Legal person	yes
Public body	yes
Non-profit	yes
International organisation	no
Secondary or Higher education establishment	yes
Research organisation	yes

SME Data

Based on the below details from the Participant Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

SME self-declared status	17/01/2022	- no
SME self-assessment	unknown	
SME validation	28/10/2008	- no

Departments carrying out the proposed work

Department 1

Department name	Communications and Transport Systems	☐ not applicable
	☐ Same as proposing organisation's address	
Street	ITN	
Town	Norrköping	
Postcode	60374	
Country	Sweden	

Links with other participants

Type of link	Participant

Main contact person

This will be the person the EU services will contact concerning this proposal (e.g. for additional information, invitation to hearings, sending of evaluation results, convocation to start grant preparation). The data in blue is read-only. Details (name, first name and e-mail) of Main Contact persons should be edited in the step "Participants" of the submission wizard.

Title Dr

Gender ○ Woman ◉ Man ○ Non Binary

First name* **Valentin**

Last name* **POLISHCHUK**

E-Mail* **valentin.polishchuk@liu.se**

Position in org. Associate Professor

Department Communications and Transport Systems

☐ Same as organisation name

☐ Same as proposing organisation's address

Street ITN

Town Norrköping

Post code 60374

Country Sweden

Website http://tiny.cc/valatm

Phone +46736569219

Phone 2 *+xxx xxxxxxxxx*

Other contact persons

First Name	Last Name	E-mail	Phone
Billy	JOSEFSSON	billy.josefsson@liu.se	+xxx xxxxxxxxx

Researchers involved in the proposal

Title	First Name	Last Name	Gender	Nationality	E-mail	Career Stage	Role of researcher (in the project)	Reference Identifier	Type of identifier

Role of participating organisation in the project

Project management	☐
Communication, dissemination and engagement	☒
Provision of research and technology infrastructure	☒
Co-definition of research and market needs	☒
Civil society representative	☐
Policy maker or regulator, incl. standardisation body	☐
Research performer	☒
Technology developer	☒
Testing/validation of approaches and ideas	☒
Prototyping and demonstration	☒
IPR management incl. technology transfer	☐
Public procurer of results	☐
Private buyer of results	☐
Finance provider (public or private)	☐
Education and training	☒
Contributions from the social sciences or/and the humanities	☐
Other If yes, please specify: (Maximum number of characters allowed: 50)	☐

List of up to 5 publications, widely-used datasets, software, goods, services, or any other achievements relevant to the call content.

Type of achievement	Short description (Max 500 characters)
Publication	*L. Sedov, V. Polishchuk, V. Bulusu. Ground risk vs. Efficiency in Urban Drone Operations. ATM Seminar'21*
Publication	*L. Sedov, V. Polishchuk, T. Maury, M. Ulloa, D. Lykova. Qualitative and quantitative risk assessment of urban airspace operations. SID'21*
Publication	*J. Nunez-Portillo, T. Polishchuk, V. Polishchuk, H. Hardell. Evaluating Impact of Non-nominal Space Mission Event on Conventional Air Traffic. SID'23*
Publication	*V. Duchamp, L. Sedov, V. Polishchuk. Density-Adapting Layers towards PBN for UTM. ATM Seminar'19*
Publication	*P. Vascik, J. Cho, V. Bulusu, V. Polishchuk. A Geometric Approach Towards Airspace Assessment for Emerging Operations. Special issue of JAT on ATM Seminar'19*

List of up to 5 most relevant previous projects or activities, connected to the subject of this proposal.

Name of Project or Activity	Short description (Max 500 characters)
ECHO2	*EU HAO ConOps Phase 2*
UTMOK	*monitoring of VLL airspace capacity*
PBN4UTM	*altitude references for U-space*
TMAKPI	*development and evaluation of ATM KPIs*

Description of any significant infrastructure and/or any major items of technical equipment, relevant to the proposed work.

Name of infrastructure of equipment	Short description (Max 300 characters)
Quantitative Risk Analysis	*GUI for identifying risk areas subjected to debris https://undefiened.github.io/uav_risk/*

Gender Equality Plan

Does the organization have a Gender Equality Plan (GEP) covering the elements listed below? (•) Yes ( ) No

Minimum process-related requirements (building blocks) for a GEP

- **Publication:** formal document published on the institution's website and signed by the top management
- **Dedicated resources:** commitment of human resources and gender expertise to implement it.
- **Data collection and monitoring:** sex/gender disaggregated data on personnel (and students for establishments concerned) and annual reporting based on indicators.
- **Training:** Awareness raising/trainings on gender equality and unconscious gender biases for staff and decision-makers.
- **Content-wise, recommended areas** to be **covered** and addressed via concrete measures and targets are:
    - work-life balance and organisational culture;
    - gender balance in leadership and decision-making;
    - gender equality in recruitment and career progression;
    - integration of the gender dimension into research and teaching content;
    - measures against gender-based violence including sexual harassment.

PIC	Legal name
999789768	*C.I.R.A. CENTRO ITALIANO RICERCHE AEROSPAZIALI SCPA*

Short name: CIRA

Address

Street	VIA MAIORISE
Town	CAPUA
Postcode	81043
Country	Italy
Webpage	www.cira.it

Specific Legal Statuses

Legal person	yes
Public body	no
Non-profit	yes
International organisation	no
Secondary or Higher education establishment	no
Research organisation	yes

SME Data

Based on the below details from the Participant Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

SME self-declared status	25/01/2022 - no
SME self-assessment	unknown
SME validation	26/06/2008 - no

Departments carrying out the proposed work

Department 1

Department name	Cross Cutting Research Directorate	☐ not applicable
	☒ Same as proposing organisation's address	
Street	VIA MAIORISE	
Town	CAPUA	
Postcode	81043	
Country	Italy	

Links with other participants

Type of link	Participant

Main contact person

This will be the person the EU services will contact concerning this proposal (e.g. for additional information, invitation to hearings, sending of evaluation results, convocation to start grant preparation). The data in blue is read-only. Details (name, first name and e-mail) of Main Contact persons should be edited in the step "Participants" of the submission wizard.

Title Dr

Gender ◉ Woman ○ Man ○ Non Binary

First name* **Angela**

Last name* **VOZELLA**

E-Mail* **a.vozella@cira.it**

Position in org. Deputy Head of cross cutting research Directorate

Department cross cutting research Directorate

☐ Same as organisation name

☒ Same as proposing organisation's address

Street VIA MAIORISE

Town CAPUA

Post code 81043

Country Italy

Website www.cira.it

Phone 0390823623723

Phone 2 *+xxx xxxxxxxxx*

Other contact persons

First Name	Last Name	E-mail	Phone
Gabriella	GIGANTE	g.gigante@cira.it	+xxx xxxxxxxxx
Francesco	NEBULA	f.nebula@cira.it	+xxx xxxxxxxxx
Lidia	TRAVASCIO	l.travascio@cira.it	+xxx xxxxxxxxx

Researchers involved in the proposal

Title	First Name	Last Name	Gender	Nationality	E-mail	Career Stage	Role of researcher (in the project)	Reference Identifier	Type of identifier
Dr	Francesco	Nebula	Man	Italy	f.nebula@cira.it	Category B Senior resea	Leading	0000-0002-3219-7245	Orcid ID
Dr	Francesco	Gargiulo	Man	Italy	f.gargiulo@cira.it	Category B Senior resea	Leading	https://www.researchgate.net/profile/Francesco-Gargiulo	Other ID
Dr	Domenico	Pascarella	Man	Italy	D.pascarella@cira.it	Category B Senior resea	Team member	0000-0003-1332-4234	Orcid ID
Dr	Angela	Errico	Woman	Italy	a.errico@cira.it	Category B Senior resea	Team member	0009-0009-3716-4096	Orcid ID

Role of participating organisation in the project

Project management	☐
Communication, dissemination and engagement	☒
Provision of research and technology infrastructure	☐
Co-definition of research and market needs	☐
Civil society representative	☐
Policy maker or regulator, incl. standardisation body	☐
Research performer	☒
Technology developer	☐
Testing/validation of approaches and ideas	☒
Prototyping and demonstration	☐
IPR management incl. technology transfer	☐
Public procurer of results	☐
Private buyer of results	☐
Finance provider (public or private)	☐
Education and training	☐
Contributions from the social sciences or/and the humanities	☐
Other If yes, please specify: (Maximum number of characters allowed: 50)	☐

List of up to 5 publications, widely-used datasets, software, goods, services, or any other achievements relevant to the call content.

Type of achievement	Short description (Max 500 characters)
Publication	*Gargiulo, F., Gigante, G., Escarré, O. B., & De Urrengoechea, T. (2024, July). SESAR GEESE Project Validation with CIRA Multi-Agent Simulation Facility: Preliminary Study. In 2024 15th International Conference on Information, Intelligence, Systems & Applications (IISA) (pp. 1-8). IEEE.*
Publication	*Gigante, G., Palumbo, R., Pascarella, D., Pellegrini, A., Duca, G., Piera, M., & Ramos, J. (2021). Support to Design for Air Traffic Management: An Approach with Agent-Based Modelling and Evolutionary Search. International Journal of Aviation, Aeronautics, and Aerospace, 8(1).*
Publication	*Pellegrini, A., Di Sanzo, P., Bevilacqua, B., Duca, G., Pascarella, D., Palumbo, R., ... & Gigante, G. (2020). Simulation-based evolutionary optimization of air traffic management. IEEE access, 8, 161551-161570.*
Publication	*Errico A., Travascio L., Vozella A. (2023) Analysis of safety metrics supporting ATM risk models. EASN 2023 Eng. Proc. 2025, 90(1), 43; https://doi.org/10.3390/engproc2025090043*
Publication	*Errico A., Buzzo G., Travascio L., Vozella A. (2025) Safety considerations about hypersonic vehicles integration into ATM/HA. Proc. of the 33rd European Safety and Reliability & 33th Society for Risk Analysis Europe Conference doi: 10.3850/978-981-94-3281-3 _ESREL-SRA-E2025-P0230-cd*

List of up to 5 most relevant previous projects or activities, connected to the subject of this proposal.

Name of Project or Activity	Short description (Max 500 characters)
JARVIS	*SESAR IR project 2023-2026* *CIRA develops the air taffic controller digital assistant implementing the tactical conflict resolution and supports the Security Assessment acording to SECRA methodology*
ECHO2	*SESAR IR 2023-2026* *CIRA supports by Multi Agent Validation Facility the Fast time simulation to validate at TRL4 the operational concept of integration in controlled airspace of HYpersonic/Supersonic and Suborbital vehicles* *CIRA supports as safety leader for solution 2 and solution 3*
GEESE	*SESAR IR 2023-2026* *CIRA supports by Multi Agent Validation Facility the Fast time simulation to validate at TRL4 the operational concept of WER operations in Continental Route*
ATC-TBO	*SESAR IR 2023-2026* *CIRA supports by Multi Agent Validation Facility the Fast time simulation to validate at TRL4 the operational concept of an Air TRaffic Digital assistant implementing tactical conflict resolution at higher levels of automation*

Description of any significant infrastructure and/or any major items of technical equipment, relevant to the proposed work.

Name of infrastructure of equipment	Short description (Max 300 characters)
Multi Agent Simulation Facility	*It employs a multi-agent framework to establish a fast-time simulation environment capable of evaluating performance metrics related not only to the aircraft, but also to the agents representing human operators.*

Gender Equality Plan

Does the organization have a Gender Equality Plan (GEP) covering the elements listed below? (•) Yes ( ) No

Minimum process-related requirements (building blocks) for a GEP

- **Publication:** formal document published on the institution's website and signed by the top management
- **Dedicated resources:** commitment of human resources and gender expertise to implement it.
- **Data collection and monitoring:** sex/gender disaggregated data on personnel (and students for establishments concerned) and annual reporting based on indicators.
- **Training:** Awareness raising/trainings on gender equality and unconscious gender biases for staff and decision-makers.
- **Content-wise, recommended areas** to be **covered** and addressed via concrete measures and targets are:
    - work-life balance and organisational culture;
    - gender balance in leadership and decision-making;
    - gender equality in recruitment and career progression;
    - integration of the gender dimension into research and teaching content;
    - measures against gender-based violence including sexual harassment.

PIC	Legal name
870545901	*SCEYE SPAIN S.L.*

Short name: Sceye Spain

Address

Street	Suero de Quiñones 34-36
Town	Madrid
Postcode	28002
Country	Spain
Webpage	www.sceye.com

Specific Legal Statuses

Legal person	yes
Public body	no
Non-profit	no
International organisation	no
Secondary or Higher education establishment	no
Research organisation	no

SME Data

Based on the below details from the Participant Registry the organisation is an SME (small- and medium-sized enterprise) for the call.

SME self-declared status	04/09/2025 - yes
SME self-assessment	unknown
SME validation	unknown

Departments carrying out the proposed work

No department involved

Department name *Name of the department/institute carrying out the work.* ☒ not applicable

☐ Same as proposing organisation's address

Street *Please enter street name and number.*

Town *Please enter the name of the town.*

Postcode *Area code.*

Country *Please select a country*

Links with other participants

Type of link	Participant

Main contact person

This will be the person the EU services will contact concerning this proposal (e.g. for additional information, invitation to hearings, sending of evaluation results, convocation to start grant preparation). The data in blue is read-only. Details (name, first name and e-mail) of Main Contact persons should be edited in the step "Participants" of the submission wizard.

Title Mr

Gender ◯ Woman ◉ Man ◯ Non Binary

First name* **Alfredo**

Last name* **SERRANO**

E-Mail* **as@sceye.com**

Position in org. Director of EMEA

Department SCEYE SPAIN S.L.

☒ Same as organisation name

☒ Same as proposing organisation's address

Street Suero de Quiñones 34-36

Town Madrid

Post code 28002

Country Spain

Website *Please enter website*

Phone *+xxx xxxxxxxxx*

Phone 2 *+xxx xxxxxxxxx*

Other contact persons

First Name	Last Name	E-mail	Phone
Stephanie	LUONGO	sl@sceye.com	+xxx xxxxxxxxx
Leonard	BOYGUES	leonard.bouygues@gmail.com	+xxx xxxxxxxxx

Researchers involved in the proposal

Title	First Name	Last Name	Gender	Nationality	E-mail	Career Stage	Role of researcher (in the project)	Reference Identifier	Type of identifier
Mr	Leonard	Bouygues	Non-binary	France	lb@sceye.com	Category A Top grade re	Leading		

Role of participating organisation in the project

Project management	☐
Communication, dissemination and engagement	☐
Provision of research and technology infrastructure	☒
Co-definition of research and market needs	☒
Civil society representative	☐
Policy maker or regulator, incl. standardisation body	☐
Research performer	☒
Technology developer	☒
Testing/validation of approaches and ideas	☒
Prototyping and demonstration	☒
IPR management incl. technology transfer	☐
Public procurer of results	☐
Private buyer of results	☒
Finance provider (public or private)	☐
Education and training	☒
Contributions from the social sciences or/and the humanities	☐
Other If yes, please specify: (Maximum number of characters allowed: 50)	☐

List of up to 5 publications, widely-used datasets, software, goods, services, or any other achievements relevant to the call content.

Type of achievement	Short description (Max 500 characters)
Publication	*Cooperative, Seamless, and Global Digital Skies for Higher Airspace (2025) - HAPS Alliance Aviation Working Group* *The Aerospace Industries Association proposes collaborative traffic management for higher airspace to manage exponential growth of UAS, supersonic, HAPS, and commercial space operations. This involves community-based rules (user-formed, CAA-approved) and operators sharing intent via service providers for conflict identification and resolution, ensuring safe and equitable global mnmg*
Publication	*Acceptable Levels of Risks for HAPS (2024) - HAPS Alliance Aviation Working Group* *For High Altitude Platform Systems, the HAPS Alliance advocates third-party-centric risk metrics, measuring risk to ground populations and manned aircraft. This replaces inadequate platform-centric aviation metrics. The framework sets individual and collective risk limits, aligned with existing infrastructure risks (e.g.UK ALARP), enabling operators to dynamically self-manage risk by controlling operational factor*
Publication	*HAPS Operation Using Attended Autonomous Fleet Systems (2022) - HAPS Alliance Aviation Working Group* *A proposal for Collaborative Traffic Management for the Stratosphere (CTMS) for Attended Autonomous Fleet Systems. This strategy enables safe, scalable HAPS operations through automation for fleet management and M2M conflict resolution. It uses Community Based Rules (CBR) and is an exception-centric approach, where human supervisory networks manage system anomalies, not individual vehicles*
Publication	*Cooperative Operations In Higher Airspace - A Proposal (2022) - Aerospace Industries Association (AIA), Emerging Technologies Commitee (ETC), Airspace Working Group* *A national strategy for higher airspace operations is crucial due to expected exponential growth and diverse commercial aircraft. Collaborative traffic management, based on community-based rules, is proposed to address challenges from increasing demand and varied vehicle profiles. This approach aims for safe and equitable global ops*
Publication	*Adaptive Risk-Based Conflict Detection for Stratospheric Flight Operations, Air Traffic Control Associate (ATCA) - Leonard Bouygues, et al (2020)* *This paper proposes an adaptive risk-based framework for conflict deconfliction in stratospheric flight operations, using a victim-centric model (1st, 2nd, & 3rd party risk) to address challenges posed by diverse vehicle performance and risk profiles.*

List of up to 5 most relevant previous projects or activities, connected to the subject of this proposal.

Name of Project or Activity	Short description (Max 500 characters)
Stratospheric Flights	*Sceye platform is the most capable LTA HAPS currently in operation. Sceye has flown successfully more than 20 missions into the stratosphere, demonstrating day-night endurance using solar power and battery storage, while keeping station over the area of operation.* *We have flown multiple payloads, including optical and hyperspectral imaging cameras, SAR, 4G telecommunications, infrasonic sensors, and aerosol particle spectrometers, validating the platform's ability to carry diverse instruments*
NASA	*Demonstrated cooperative deconfliction capabilities with other HAPS operators through NASA-led CE1.5 simulation*

Description of any significant infrastructure and/or any major items of technical equipment, relevant to the proposed work.

Name of infrastructure of equipment	Short description (Max 300 characters)

Flight Simulator	*Sceye designed and built a simulator to model the platform dynamics and trajectory. By using global weather data, the simulator can predict accurately the platform's navigation path, ascend and descent trajectories, and also model solar energy management system and internal gas dynamics.*

Gender Equality Plan

Does the organization have a Gender Equality Plan (GEP) covering the elements listed below? ○ Yes ◉ No

Minimum process-related requirements (building blocks) for a GEP

- **Publication:** formal document published on the institution's website and signed by the top management
- **Dedicated resources:** commitment of human resources and gender expertise to implement it.
- **Data collection and monitoring:** sex/gender disaggregated data on personnel (and students for establishments concerned) and annual reporting based on indicators.
- **Training:** Awareness raising/trainings on gender equality and unconscious gender biases for staff and decision-makers.
- **Content-wise, recommended areas** to be **covered** and addressed via concrete measures and targets are:
    - work-life balance and organisational culture;
    - gender balance in leadership and decision-making;
    - gender equality in recruitment and career progression;
    - integration of the gender dimension into research and teaching content;
    - measures against gender-based violence including sexual harassment.

PIC	Legal name
899059730	*INTERNATIONAL FEDERATION OF AIR TRAFFIC CONTROLLERS ASSOCIATIONS*

Short name: IFATCA

Address

Street	360 ST JACQUES SUITE 2002
Town	MONTREAL
Postcode	H2Y 1P5
Country	Canada
Webpage	www.ifatca.org

Specific Legal Statuses

Legal person	yes
Public body	no
Non-profit	yes
International organisation	no
Secondary or Higher education establishment	no
Research organisation	no

SME Data

Based on the below details from the Participant Registry the organisation is unknown (small- and medium-sized enterprise) for the call.

SME self-declared status	unknown
SME self-assessment	unknown
SME validation	unknown

Departments carrying out the proposed work

No department involved

Department name *Name of the department/institute carrying out the work.* ☒ not applicable

☐ Same as proposing organisation's address

Street *Please enter street name and number.*

Town *Please enter the name of the town.*

Postcode *Area code.*

Country *Please select a country*

Links with other participants

Type of link	Participant

Main contact person

This will be the person the EU services will contact concerning this proposal (e.g. for additional information, invitation to hearings, sending of evaluation results, convocation to start grant preparation). The data in blue is read-only. Details (name, first name and e-mail) of Main Contact persons should be edited in the step "Participants" of the submission wizard.

Title Mr

Gender ◯ Woman ◉ Man ◯ Non Binary

First name* **Marc**

Last name* **BAUMGARTNER**

E-Mail* **sesar.coord@ifatca.org**

Position in org. SESAR CONTRIBUTION COORDINATOR

Department INTERNATIONAL FEDERATION OF AIR TRAFFIC CONTROLLERS ASSOCIATIONS

☒ Same as organisation name

☒ Same as proposing organisation's address

Street 360 ST JACQUES SUITE 2002

Town MONTREAL

Post code H2Y 1P5

Country Canada

Website www.ifatca.org

Phone +41792125769

Phone 2 *+xxx xxxxxxxxx*

Other contact persons

First Name	Last Name	E-mail	Phone
Eugenio	DIOTALEVI	eugenio.diotalevi@ifatca.org	+xxx xxxxxxxxx

Researchers involved in the proposal

Title	First Name	Last Name	Gender	Nationality	E-mail	Career Stage	Role of researcher (in the project)	Reference Identifier	Type of identifier
Mr	Eugenio	Diatolevi	Man	Italy	eugenio.diatolevi@ifatca.org	Category D First stage r	Leading		
Mr	Marc	Baumgartner	Man	Switzerland	sesar.coord@ifatca.org	Category C Recognised	Team member	0000-0003-4443-329X	Orcid ID

Role of participating organisation in the project

Project management	☒
Communication, dissemination and engagement	☒
Provision of research and technology infrastructure	☐
Co-definition of research and market needs	☐
Civil society representative	☐
Policy maker or regulator, incl. standardisation body	☐
Research performer	☐
Technology developer	☐
Testing/validation of approaches and ideas	☐
Prototyping and demonstration	☐
IPR management incl. technology transfer	☐
Public procurer of results	☐
Private buyer of results	☐
Finance provider (public or private)	☐
Education and training	☒
Contributions from the social sciences or/and the humanities	☐
Other If yes, please specify: (Maximum number of characters allowed: 50)	☐

List of up to 5 publications, widely-used datasets, software, goods, services, or any other achievements relevant to the call content.

Type of achievement	Short description (Max 500 characters)
Publication	*IFATCA study on High Altitude Operations. Working Paper 93 2023 leading to IFATCA Policy on HAO*
Publication	*IFATCA Technical and Professional Manual WC 10.2.5 AUTOMATION / HUMAN FACTORS*

List of up to 5 most relevant previous projects or activities, connected to the subject of this proposal.

Name of Project or Activity	Short description (Max 500 characters)

Description of any significant infrastructure and/or any major items of technical equipment, relevant to the proposed work.

Name of infrastructure of equipment	Short description (Max 300 characters)

Gender Equality Plan

Does the organization have a Gender Equality Plan (GEP) covering the elements listed below? (•) Yes ( ) No

Minimum process-related requirements (building blocks) for a GEP

- **Publication:** formal document published on the institution's website and signed by the top management
- **Dedicated resources:** commitment of human resources and gender expertise to implement it.
- **Data collection and monitoring:** sex/gender disaggregated data on personnel (and students for establishments concerned) and annual reporting based on indicators.
- **Training:** Awareness raising/trainings on gender equality and unconscious gender biases for staff and decision-makers.
- **Content-wise, recommended areas** to be **covered** and addressed via concrete measures and targets are:
    - work-life balance and organisational culture;
    - gender balance in leadership and decision-making;
    - gender equality in recruitment and career progression;
    - integration of the gender dimension into research and teaching content;
    - measures against gender-based violence including sexual harassment.

PIC	Legal name
873172467	*OpenUTM Ltd.*

Short name: OpenUTM

Address

Street	Mespil Business Center, Mespil House, Sussex Ho
Town	Dublin
Postcode	D04 T4A6
Country	Ireland
Webpage	https://openutm.net

Specific Legal Statuses

Legal person	yes
Public body	no
Non-profit	no
International organisation	no
Secondary or Higher education establishment	no
Research organisation	no

SME Data

Based on the below details from the Participant Registry the organisation is an SME (small- and medium-sized enterprise) for the call.

SME self-declared status	14/02/2025 - yes
SME self-assessment	unknown
SME validation	unknown

Departments carrying out the proposed work

No department involved

Department name *Name of the department/institute carrying out the work.* ☒ not applicable

☐ Same as proposing organisation's address

Street *Please enter street name and number.*

Town *Please enter the name of the town.*

Postcode *Area code.*

Country *Please select a country*

Links with other participants

Type of link	Participant

Main contact person

This will be the person the EU services will contact concerning this proposal (e.g. for additional information, invitation to hearings, sending of evaluation results, convocation to start grant preparation). The data in blue is read-only. Details (name, first name and e-mail) of Main Contact persons should be edited in the step "Participants" of the submission wizard.

Title: Dr

Gender: ○ Woman ◉ Man ○ Non Binary

First name*: **Dr Hrishikesh**

Last name*: **Ballal**

E-Mail*: **hb@openutm.net**

Position in org.: Managing Director

Department: OpenUTM Ltd.

☒ Same as organisation name

☒ Same as proposing organisation's address

Street: Mespil Business Center, Mespil House, Sussex House

Town: Dublin

Post code: D04 T4A6

Country: Ireland

Website: *Please enter website*

Phone: *+xxx xxxxxxxxx*

Phone 2: *+xxx xxxxxxxxx*

Researchers involved in the proposal

Title	First Name	Last Name	Gender	Nationality	E-mail	Career Stage	Role of researcher (in the project)	Reference Identifier	Type of identifier
Dr	Hrishikesh	Ballal	Man	Ireland	hb@openutm.net	Category B Senior resea	Leading		

Administrative forms

Role of participating organisation in the project

Project management	☐
Communication, dissemination and engagement	☐
Provision of research and technology infrastructure	☐
Co-definition of research and market needs	☐
Civil society representative	☐
Policy maker or regulator, incl. standardisation body	☐
Research performer	☐
Technology developer	☒
Testing/validation of approaches and ideas	☐
Prototyping and demonstration	☐
IPR management incl. technology transfer	☐
Public procurer of results	☐
Private buyer of results	☐
Finance provider (public or private)	☐
Education and training	☐
Contributions from the social sciences or/and the humanities	☐
Other If yes, please specify: (Maximum number of characters allowed: 50)	☐

List of up to 5 publications, widely-used datasets, software, goods, services, or any other achievements relevant to the call content.

Type of achievement	Short description (Max 500 characters)
Software	*OpenUTM is an open-source, standards-compliant stack for Unmanned Traffic Management (UTM), designed to help organizations build and deploy regulation-ready systems for managing drone and unmanned aircraft traffic. Its architecture is built around two core components: Flight Blender, a backend service handling Remote ID, air traffic data, geofencing, and strategic deconfliction, and Flight Spotlight, a frontend interface providing maps, timelines, flight noticeboards, and 3D visualizations.*

List of up to 5 most relevant previous projects or activities, connected to the subject of this proposal.

Name of Project or Activity	Short description (Max 500 characters)

Description of any significant infrastructure and/or any major items of technical equipment, relevant to the proposed work.

Name of infrastructure of equipment	Short description (Max 300 characters)

Gender Equality Plan

Does the organization have a Gender Equality Plan (GEP) covering the elements listed below? ○ Yes ◉ No

Minimum process-related requirements (building blocks) for a GEP

- **Publication:** formal document published on the institution's website and signed by the top management
- **Dedicated resources:** commitment of human resources and gender expertise to implement it.
- **Data collection and monitoring:** sex/gender disaggregated data on personnel (and students for establishments concerned) and annual reporting based on indicators.
- **Training:** Awareness raising/trainings on gender equality and unconscious gender biases for staff and decision-makers.
- **Content-wise, recommended areas** to be **covered** and addressed via concrete measures and targets are:
    - work-life balance and organisational culture;
    - gender balance in leadership and decision-making;
    - gender equality in recruitment and career progression;
    - integration of the gender dimension into research and teaching content;
    - measures against gender-based violence including sexual harassment.

PIC	Legal name
999961555	*THALES LAS FRANCE SAS*

Short name: THALES LAS FRANCE SAS

Address

Street	AVENUE GAY LUSSAC 2
Town	ELANCOURT
Postcode	78990
Country	France
Webpage	www.thalesgroup.com

Specific Legal Statuses

Legal person	yes
Public body	no
Non-profit	no
International organisation	no
Secondary or Higher education establishment	no
Research organisation	no

SME Data

Based on the below details from the Participant Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

SME self-declared status	22/11/2023 - no
SME self-assessment	unknown
SME validation	unknown

Departments carrying out the proposed work

No department involved

Department name *Name of the department/institute carrying out the work.* ☒ not applicable

☐ Same as proposing organisation's address

Street *Please enter street name and number.*

Town *Please enter the name of the town.*

Postcode *Area code.*

Country *Please select a country*

Department 2

Department name IAS Business Line ☐ not applicable

☐ Same as proposing organisation's address

Street 1 avenue Carnot

Town Massy

Postcode 91300

Country France

Links with other participants

Type of link	Participant

Main contact person

This will be the person the EU services will contact concerning this proposal (e.g. for additional information, invitation to hearings, sending of evaluation results, convocation to start grant preparation). The data in blue is read-only. Details (name, first name and e-mail) of Main Contact persons should be edited in the step "Participants" of the submission wizard.

Title: Mrs

Gender: (•) Woman ( ) Man ( ) Non Binary

First name*: **Claire**

Last name*: **Cadet**

E-Mail*: **claire.cadet@thalesgroup.com**

Position in org.: Sales manager

Department: THALES LAS FRANCE SAS

☒ Same as organisation name

☒ Same as proposing organisation's address

Street: AVENUE GAY LUSSAC 2

Town: ELANCOURT

Post code: 78990

Country: France

Website: *Please enter website*

Phone: +33 6 63 32 54 09

Phone 2: *+xxx xxxxxxxxx*

Other contact persons

First Name	Last Name	E-mail	Phone
Jean-Yves	Schneider	jean-yves.schneider@thalesgroup.com	+33 6 86 43 67 84
Alix	De Saint Meloir	alix.de-saint-meloir@thalesgroup.com	+33 6 59 42 51 06
Marion	ANDRE TELLIEZ	marion.telliez@thalesgroup.com	+33 7 64 57 67 62

Researchers involved in the proposal

Title	First Name	Last Name	Gender	Nationality	E-mail	Career Stage	Role of researcher (in the project)	Reference Identifier	Type of identifier

Role of participating organisation in the project

Project management	☐
Communication, dissemination and engagement	☐
Provision of research and technology infrastructure	☐
Co-definition of research and market needs	☐
Civil society representative	☐
Policy maker or regulator, incl. standardisation body	☐
Research performer	☐
Technology developer	☒
Testing/validation of approaches and ideas	☒
Prototyping and demonstration	☒
IPR management incl. technology transfer	☐
Public procurer of results	☐
Private buyer of results	☐
Finance provider (public or private)	☐
Education and training	☐
Contributions from the social sciences or/and the humanities	☐
Other If yes, please specify: (Maximum number of characters allowed: 50)	☐

List of up to 5 publications, widely-used datasets, software, goods, services, or any other achievements relevant to the call content.

Type of achievement	Short description (Max 500 characters)

List of up to 5 most relevant previous projects or activities, connected to the subject of this proposal.

Name of Project or Activity	Short description (Max 500 characters)

Description of any significant infrastructure and/or any major items of technical equipment, relevant to the proposed work.

Name of infrastructure of equipment	Short description (Max 300 characters)

Gender Equality Plan

Does the organization have a Gender Equality Plan (GEP) covering the elements listed below? (•) Yes ( ) No

Minimum process-related requirements (building blocks) for a GEP

- **Publication:** formal document published on the institution's website and signed by the top management
- **Dedicated resources:** commitment of human resources and gender expertise to implement it.
- **Data collection and monitoring:** sex/gender disaggregated data on personnel (and students for establishments concerned) and annual reporting based on indicators.
- **Training:** Awareness raising/trainings on gender equality and unconscious gender biases for staff and decision-makers.
- **Content-wise, recommended areas** to be **covered** and addressed via concrete measures and targets are:
    - work-life balance and organisational culture;
    - gender balance in leadership and decision-making;
    - gender equality in recruitment and career progression;
    - integration of the gender dimension into research and teaching content;
    - measures against gender-based violence including sexual harassment.

PIC	Legal name
894907645	*ANRA TECHNOLOGIES UK LTD*

Short name: ANRA TECHNOLOGIES UK LTD

Address

Street	114 HIGH STREET
Town	CRANFIELD, BEDS
Postcode	MK43 0DG
Country	United Kingdom
Webpage	www.flyanra.com

Specific Legal Statuses

Legal person	yes
Public body	no
Non-profit	no
International organisation	no
Secondary or Higher education establishment	no
Research organisation	no

SME Data

Based on the below details from the Participant Registry the organisation is an SME (small- and medium-sized enterprise) for the call.

SME self-declared status	09/09/2025 - yes
SME self-assessment	unknown
SME validation	unknown

Departments carrying out the proposed work

No department involved

Department name *Name of the department/institute carrying out the work.* ☒ not applicable

☐ Same as proposing organisation's address

Street *Please enter street name and number.*

Town *Please enter the name of the town.*

Postcode *Area code.*

Country *Please select a country*

Links with other participants

Type of link	Participant

Main contact person

This will be the person the EU services will contact concerning this proposal (e.g. for additional information, invitation to hearings, sending of evaluation results, convocation to start grant preparation). The data in blue is read-only. Details (name, first name and e-mail) of Main Contact persons should be edited in the step "Participants" of the submission wizard.

Title Dr

Gender ◯ Woman ◉ Man ◯ Non Binary

First name* **Ajay**

Last name* **Modha**

E-Mail* **amodha@flyanra.com**

Position in org. Director

Department ANRA TECHNOLOGIES UK LTD

☒ Same as organisation name

☒ Same as proposing organisation's address

Street 114 HIGH STREET

Town CRANFIELD, BEDS

Post code MK43 0DG

Country United Kingdom

Website *Please enter website*

Phone *+xxx xxxxxxxxx*

Phone 2 *+xxx xxxxxxxxx*

Researchers involved in the proposal

Title	First Name	Last Name	Gender	Nationality	E-mail	Career Stage	Role of researcher (in the project)	Reference Identifier	Type of identifier
Dr	Ajay	Modha	Man	United Kingdom	amodha@flyanra.com	Category A Top grade re	Leading		
Mr	David	Murphy	Man	United Kingdom	amodha@flyanra.com	Category B Senior resea	Team member		

Role of participating organisation in the project

Project management	☐
Communication, dissemination and engagement	☐
Provision of research and technology infrastructure	☐
Co-definition of research and market needs	☒
Civil society representative	☐
Policy maker or regulator, incl. standardisation body	☐
Research performer	☒
Technology developer	☒
Testing/validation of approaches and ideas	☒
Prototyping and demonstration	☒
IPR management incl. technology transfer	☐
Public procurer of results	☐
Private buyer of results	☐
Finance provider (public or private)	☐
Education and training	☐
Contributions from the social sciences or/and the humanities	☐
Other If yes, please specify: (Maximum number of characters allowed: 50)	☐

List of up to 5 publications, widely-used datasets, software, goods, services, or any other achievements relevant to the call content.

Type of achievement	Short description (Max 500 characters)
Software	*ANRA NOON: ANRA is an EASA certified U-space Service Provider, and ANRA NOON is an airspace management software platform for uncrewed aircraft. U-space services support the management of uncrewed aircraft operations in U-space airspace.*
Software	*ANRA AAM Traffic Management tool: airspace management for Advanced Air Mobility aircraft.*
Software	*ANRA's SIM tool: Provides the engine to drive a Digital Twin experience for virtual drone operations*

List of up to 5 most relevant previous projects or activities, connected to the subject of this proposal.

Name of Project or Activity	Short description (Max 500 characters)
Corus five (2025-2028)	*The project aims to extend and mature the SESAR U-space Concept of Operations for the integration of drones into controlled airspace. Building on the success of CORUS and CORUS XUAM, it is expanding the scope to cover areas currently not included such as above very low level airspace and near controlled airports. The updated ConOps will include functionalities and U3/U4 services supporting U-space integration, and propose SESAR Solutions, flight rules, and airspace structure elements.*
Managing Shared Airspace (2025 - 2026)	*The project aims to implement and validate a UK Concept of Operations for UTM supported UAS operations. It seeks to operationalise an industry-driven approach for UTM services that support multiple overlapping Beyond Visual Line of Sight (BVLOS) operations within shared airspace.*
SAFIR-Ready (2023-2026)	*The SAFIR-Ready project aims to demonstrate airspace automation to TRL 7 for drone-based emergency medical and critical infrastructure responses. ANRA contributed its U-space software together with the development of custom workflows and services to connect networked operations centres with the U-space ecosystem.*

Description of any significant infrastructure and/or any major items of technical equipment, relevant to the proposed work.

Name of infrastructure of equipment	Short description (Max 300 characters)

Gender Equality Plan

Does the organization have a Gender Equality Plan (GEP) covering the elements listed below? ○ Yes ◉ No

Minimum process-related requirements (building blocks) for a GEP

- **Publication:** formal document published on the institution's website and signed by the top management
- **Dedicated resources:** commitment of human resources and gender expertise to implement it.
- **Data collection and monitoring:** sex/gender disaggregated data on personnel (and students for establishments concerned) and annual reporting based on indicators.
- **Training:** Awareness raising/trainings on gender equality and unconscious gender biases for staff and decision-makers.
- **Content-wise, recommended areas** to be **covered** and addressed via concrete measures and targets are:
    - work-life balance and organisational culture;
    - gender balance in leadership and decision-making;
    - gender equality in recruitment and career progression;
    - integration of the gender dimension into research and teaching content;
    - measures against gender-based violence including sexual harassment.

PIC	Legal name
869703941	*HAPS Alliance*

Short name: HAPS Alliance

Address

Street	401 Edgewater Place, Suite 600
Town	Wakefield
Postcode	01880
Country	United States
Webpage	www.hapsalliance.org

Specific Legal Statuses

Legal person	yes
Public body	no
Non-profit	yes
International organisation	no
Secondary or Higher education establishment	no
Research organisation	no

SME Data

Based on the below details from the Participant Registry the organisation is an SME (small- and medium-sized enterprise) for the call.

SME self-declared status	30/08/2025 - yes
SME self-assessment	unknown
SME validation	unknown

Departments carrying out the proposed work

No department involved

Department name *Name of the department/institute carrying out the work.* ☒ not applicable

☐ Same as proposing organisation's address

Street *Please enter street name and number.*

Town *Please enter the name of the town.*

Postcode *Area code.*

Country *Please select a country*

Links with other participants

Type of link	Participant

Researchers involved in the proposal

Title	First Name	Last Name	Gender	Nationality	E-mail	Career Stage	Role of researcher (in the project)	Reference Identifier	Type of identifier

Role of participating organisation in the project

Project management	☐
Communication, dissemination and engagement	☐
Provision of research and technology infrastructure	☐
Co-definition of research and market needs	☐
Civil society representative	☐
Policy maker or regulator, incl. standardisation body	☐
Research performer	☒
Technology developer	☒
Testing/validation of approaches and ideas	☒
Prototyping and demonstration	☐
IPR management incl. technology transfer	☐
Public procurer of results	☐
Private buyer of results	☐
Finance provider (public or private)	☐
Education and training	☐
Contributions from the social sciences or/and the humanities	☐
Other If yes, please specify: (Maximum number of characters allowed: 50)	☐

List of up to 5 publications, widely-used datasets, software, goods, services, or any other achievements relevant to the call content.

Type of achievement	Short description (Max 500 characters)
Publication	*Cooperative, Seamless, and Global Digital Skies for Higher Airspace : The purpose of the paper is to assist the aviation and aerospace global communities in understanding an industry perspective and vision for a global harmonized, cross-border, and integrated Higher Airspace Operations Traffic Management, which supports the seamless integration of highly automated operations.*
Publication	*HAPS Certification Pathways: The purpose of this document is to identify the key challenges faced by the High Altitude Platform System (HAPS) community in getting regulatory approval to start commercial operations and recommended actions that the HAPS Alliance can take to address these challenges. Operational challenges are covered only from the perspective of the potential impact they have on air vehicle performance.*
Publication	*Acceptable Levels of Risk for HAPS : This paper discusses setting acceptable levels of risk for High Altitude Platform System (HAPS). It discusses the safety metrics traditionally used in aviation are not adequate to establish target levels of safety for HAPS. Then it proposes to set acceptable levels of risk to be consistent with the risk already accepted by the exposed parties. Then it proposes a framework by which an operator self-manages the collective risk it generates.*

List of up to 5 most relevant previous projects or activities, connected to the subject of this proposal.

Name of Project or Activity	Short description (Max 500 characters)

Description of any significant infrastructure and/or any major items of technical equipment, relevant to the proposed work.

Name of infrastructure of equipment	Short description (Max 300 characters)

Gender Equality Plan

Does the organization have a Gender Equality Plan (GEP) covering the elements listed below? ○ Yes ◉ No

Minimum process-related requirements (building blocks) for a GEP

- **Publication:** formal document published on the institution's website and signed by the top management
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- **Training:** Awareness raising/trainings on gender equality and unconscious gender biases for staff and decision-makers.
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    - work-life balance and organisational culture;
    - gender balance in leadership and decision-making;
    - gender equality in recruitment and career progression;
    - integration of the gender dimension into research and teaching content;
    - measures against gender-based violence including sexual harassment.

3 - Budget

No	Name of Beneficiary	Country	Role	Requested grant amount	Income generated by the action	Financial contributions	Own resources	Total estimated income
1	Eurocontrol - European Organisation For The Safety Of Air Navigation	BE	Coordinator	0.00	0	0	3 702 617	3 702 617.00
2	Dfs Deutsche Flugsicherung Gmbh	DE	Partner	81 130.00	0	34 770	0	115 900.00
3	Deutsches Zentrum Fur Luft - Und Raumfahrt Ev	DE	Partner	908 224.63	0	0	389 239	1 297 463.63
4	Luftfartsverket	SE	Partner	315 285.78	0	0	135 123	450 408.78
5	Enav Spa	IT	Partner	176 917.31	0	75 822	0	252 739.31
6	Nats (En Route) Public Limited Company	UK	Partner	217 059.41	0	93 025	0	310 084.41
7	Enaire	ES	Partner	106 750.00	0	45 750	0	152 500.00
8	Europe Space Centre Gmbh	DE	Partner	55 835.85	0	0	23 930	79 765.85
9	Ente Nazionale Per L'aviazione Civile - Enac Italian Civil Aviation Authority	IT	Partner	242 383.75	0	103 879	0	346 262.75
10	Skynav Europe	BE	Partner	842 928.98	0	0	361 255	1 204 183.98
11	Ecole Nationale De L Aviation Civile	FR	Partner	162 470.00	0	0	69 630	232 100.00
12	Linkopings Universitet	SE	Partner	73 237.50	0	0	31 387	104 624.50
13	C.i.r.a. Centro Italiano Ricerche Aerospaziali Scpa	IT	Partner	279 226.78	0	0	119 669	398 895.78
14	Sceye Spain S.l.	ES	Partner	190 400.00	0	0	81 600	272 000.00

Proposal ID **101288039**

Acronym **SPARTA**

15	International Federation Of Air Traffic Controllers Associations	CA	Partner	116 812.50	0	0	50 063	166 875.50
16	Openutm Ltd.	IE	Partner	59 745.00	0	0	25 605	85 350.00
17	Thales Las France Sas	FR	Partner	114 625.00	0	0	49 125	163 750.00
18	Anra Technologies Uk Ltd	UK	Partner	168 317.63	0	0	72 136	240 453.63
19	Haps Alliance	US	Associated	0.00	0	0	0	0.00
	Total			4 111 350.12		353 246	5 111 379	

4 - Ethics & security

Ethics Issues Table

1. Human Embryonic Stem Cells and Human Embryos			Page
Does this activity involve Human Embryonic Stem Cells (hESCs)?	○ Yes	◉ No	
Does this activity involve the use of human embryos?	○ Yes	◉ No	
2. Humans			**Page**
Does this activity involve human participants?	○ Yes	◉ No	
Does this activity involve interventions (physical also including imaging technology, behavioural treatments, etc.) on the study participants?	○ Yes	◉ No	
Does this activity involve conducting a clinical study as defined by the Clinical Trial Regulation (EU 536/2014)? (using pharmaceuticals, biologicals, radiopharmaceuticals, or advanced therapy medicinal products)	○ Yes	◉ No	
3. Human Cells / Tissues (not covered by section 1)			**Page**
Does this activity involve the use of human cells or tissues?	○ Yes	◉ No	
4. Personal Data			**Page**
Does this activity involve processing of personal data?	○ Yes	◉ No	
Does this activity involve further processing of previously collected personal data (including use of preexisting data sets or sources, merging existing data sets)?	○ Yes	◉ No	
Is it planned to export personal data from the EU to non-EU countries?	○ Yes	◉ No	
Is it planned to import personal data from non-EU countries into the EU or from a non-EU country to another non-EU country?	○ Yes	◉ No	
Does this activity involve the processing of personal data related to criminal convictions or offences?	○ Yes	◉ No	
5. Animals			**Page**
Does this activity involve animals?	○ Yes	◉ No	
6. Non-EU Countries			**Page**
Will some of the activities be carried out in non-EU countries?	○ Yes	◉ No	
In case non-EU countries are involved, do the activities undertaken in these countries raise potential ethics issues?	○ Yes	◉ No	
It is planned to use local resources (e.g. animal and/or human tissue samples, genetic material, live animals, human remains, materials of historical value, endangered fauna or flora samples, etc.)?	○ Yes	◉ No	
Is it planned to import any material (other than data) from non-EU countries into the EU or from a non-EU country to another non-EU country? For data imports, see section 4.	○ Yes	◉ No	
Is it planned to export any material (other than data) from the EU to non-EU countries? For data exports, see section 4.	○ Yes	◉ No	
Does this activity involve low and/or lower middle income countries, (if yes, detail the benefit-sharing actions planned in the self-assessment)	○ Yes	◉ No	
Could the situation in the country put the individuals taking part in the activity at risk?	○ Yes	◉ No	
7. Environment, Health and Safety			**Page**

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Does this activity involve the use of substances or processes that may cause harm to the environment, to animals or plants.(during the implementation of the activity or further to the use of the results, as a possible impact) ?	◯ Yes	◉ No	
Does this activity deal with endangered fauna and/or flora / protected areas?	◯ Yes	◉ No	
Does this activity involve the use of substances or processes that may cause harm to humans, including those performing the activity.(during the implementation of the activity or further to the use of the results, as a possible impact) ?	◯ Yes	◉ No	

8. Artificial Intelligence			Page
Does this activity involve the development, deployment and/or use of Artificial Intelligence-based systems?	◯ Yes	◉ No	

9. Other Ethics Issues			Page
Are there any other ethics issues that should be taken into consideration?	◯ Yes	◉ No	

I confirm that I have taken into account all ethics issues above and that, if any ethics issues apply, I will complete the ethics self-assessment as described in the guidelines How to Complete your Ethics Self-Assessment ☒

Administrative forms

Proposal ID **101288039**

Acronym **SPARTA**

Ethics Self-Assessment

Ethical dimension of the objectives, methodology and likely impact

Explain in detail the identified issues in relation to:
- objectives of the activities (e.g. study of vulnerable populations, etc.)
- methodology (e.g. clinical trials, involvement of children, protection of personal data, etc.)
- the potential impact of the activities (e.g. environmental damage, stigmatisation of particular social groups, political or financial adverse consequences, misuse, etc.)

Remaining characters 5000

Compliance with ethical principles and relevant legislations

Describe how the issue(s) identified in the ethics issues table above will be addressed in order to adhere to the ethical principles and what will be done to ensure that the activities are compliant with the EU/national legal and ethical requirements of the country or countries where the tasks are to be carried out. It is reminded that for activities performed in a non-EU countries, they should also be allowed in at least one EU Member State.

Remaining characters 5000

Administrative forms

Proposal ID **101288039**

Acronym **SPARTA**

Security issues table

1. EU Classified Information (EUCI)[2]			Page
Does this activity involve information and/or materials requiring protection against unauthorised disclosure (EUCI)?	○ Yes	◉ No	
Does this activity involve non-EU countries which need to have access to EUCI?	○ Yes	◉ No	
2. Misuse			**Page**
Does this activity have the potential for misuse of results?	○ Yes	◉ No	
3. Other Security Issues			**Page**
Does this activity involve information and/or materials subject to national security restrictions? If yes, please specify: (Maximum number of characters allowed: 1000)	○ Yes	◉ No	
Are there any other security issues that should be taken into consideration? If yes, please specify: (Maximum number of characters allowed: 1000)	○ Yes	◉ No	

Security self-assessment

Please specify: (Maximum number of characters allowed: 5000)

Remaining characters 5000

[2]According to the Commission Decision (EU, Euratom) 2015/444 of 13 March 2015 on the security rules for protecting EU classified information, "European Union classified information (EUCI) means any information or material designated by an EU security classification, the unauthorised disclosure of which could cause varying degrees of prejudice to the interests of the European Union or of one or more of the Member States".

[3]Classified background information is information that is already classified by a country and/or international organisation and/or the EU and is going to be used by the project. In this case, the project must have in advance the authorisation from the originator of the classified information, which is the entity (EU institution, EU Member State, third state or international organisation) under whose authority the classified information has been generated.

[4]EU classified foreground information is information (documents/deliverables/materials) planned to be generated by the project and that needs to be protected from unauthorised disclosure. The originator of the EUCI generated by the project is the European Commission.

Proposal template Part B: technical description

SPARTA — SPACE-ATM REAL-TIME AWARENESS

[This document is tagged. Do not delete the tags; they are needed for processing.] #@APP-FORM-HERIAIA@#

List of participants

Participant No. *	Participant organisation name	Country
1 (Coordinator)	EUROCONTROL	Belgium (BE)
2	DFS Detusche Flugsicherung GmbH	Germany (DE)
3	DEUTSCHES ZENTRUM FUR LUFT - UND RAUMFAHRT EV	Germany (DE)
4	SWEDISH CIVIL AVIATION ADMINISTRATION	Sweden (SE)
5	ENAV	Italy (IT)
6	NATS	United Kingdom (UK)
7	ENAIRE	Spain (ES)
8	Europe Space Centre GmbH / SaxaVord	Germany (DE)
9	ENAC IT	Italy (IT)
10	SkyNav Europe	Belgium (BE)
11	ECOLE NATIONALE DE L AVIATION CIVILE	France (FR)
12	LINKOPINGS UNIVERSITET	Sweden (SE)
13	C.I.R.A. CENTRO ITALIANO RICERCHE AEROSPAZIALI SCPA	Italy (IT)
14	SCEYE SPAIN	Spain (ES)
15	INTERNATIONAL FEDERATION OF AIR TRAFFIC CONTROLLERS ASSOCIATIONS	Canada (CA)
16	OpenUTM	Ireland (IE)
17	THALES LAS	France (FR)
18	ANRA TECHNOLOGIES UK LTD	United Kingdom
19	HAPS Alliance	United States

1. Excellence #@REL-EVA-RE@#

1.1 Objectives and ambition #@PRJ-OBJ-PO@#

Space Transport Operations (STO) are rapidly becoming a strategic capability for Europe. Regular launch and re-entry activities underpin Europe's autonomy in space access, sustain critical services such as navigation, communications and Earth observation, and support scientific and defence programmes. Emerging suborbital transport and high-altitude operations (HAO), including long-endurance HAPS, offer further opportunities for connectivity, mobility, and resilience. Together these developments are reshaping the European airspace environment. The ability to manage STO safely and efficiently within the ATM system is therefore not only a technical necessity but a matter of economic competitiveness, social benefit, and strategic security for the European Union.

The objective of SPARTA is to provide the European ATM system with the procedures, tools, and data services required to integrate STO safely and efficiently into the network. This includes ensuring that mission intent, trajectories, hazard areas, and dynamic updates can be processed consistently by the Network Manager (NM), ANSPs and State authorities, while minimising disruption to other airspace users. The project will deliver validated concepts and specifications at TRL 6, ready to support future regulatory and industrial uptake, and will establish pathways towards standardisation and compliance material to enable deployment. A further objective is to ensure that these capabilities are interoperable at the global level and adaptable to new classes of operations, so that Europe maintains both autonomy and alignment in international spaceflight integration.

To achieve these objectives, SPARTA is structured into two SESAR Solutions that mirror the operational lifecycle of a mission: Solution 1 for strategic and pre-tactical planning, and Solution 2 for dynamic real-time operations. Standardised, digital data exchange is embedded in both, ensuring that mission intent, trajectory information, and hazard updates are managed consistently across all stakeholders.

Solution 1 – Flexible and Scalable Mission Planning

Planning is the foundation for safe and efficient integration of STO into the European network. Solution 1 addresses the strategic and pre-tactical phases, where mission intent must be captured, trajectories assessed, hazard areas defined, and airspace reservations agreed well in advance of operations. The aim is to give the Network Manager, ANSPs and State authorities a structured framework to evaluate impacts, negotiate adaptations, and publish decisions, while providing operators with clear and predictable processes. Enhanced digital interfaces and harmonised data services ensure that planning information can be exchanged consistently across stakeholders and integrated seamlessly with ATM systems. Therefore Solution 1 aims to:

a) Develop digital mission planning interfaces (API) for STO, enabling standardised, scalable submission of mission intent, trajectories and hazard areas, with the capacity to accept HAPS submissions where these interact with STO or the network.

b) Define planning specifications that adapt concepts such as FF-ICE to support structured submission of STO missions, including negotiation of launch and re-entry trajectories around predicted hazard areas, while enabling HAPS operators to represent 4D Operating Zones (4DOZ) or swarms in a form that NM and ANSPs can assess for network impact.

c) Introduce 4DOZ designation, visualisation and approval workflows that support hazard area management for launches and re-entries, and provide a consistent framework for accommodating HAPS where operations overlap with STO.

d) Establish network-wide Collaborative Decision-Making (CDM) processes to support strategic and pre-tactical coordination of STO missions, ensuring timely interaction between operators, ANSPs, States and NM, with provisions to include HAPS or other high-altitude users where relevant.

e) Implement machine-to-machine data exchange channels for mission planning, trajectory updates and hazard area definition, using harmonised data models compatible with SWIM, ICAO and CCSDS (Consultative Committee for Space Data Systems) standards where applicable.

f) Automate publication of planned and revised hazard geometries through SWIM and digital NOTAM services, ensuring timely distribution to NM and ANSP systems for launches and re-entries, and supporting affected HAPS where interactions occur.

Solution 2 – Dynamic Real-Time Operations

The execution of launches and re-entries places unique demands on ATM, as hazard areas can change rapidly, anomalies may arise without warning, and airspace must be released quickly once it is no longer required. Solution 2 develops the real-time coordination capability needed to manage these events at the level of NM, ATFM units and ATC. By integrating live mission-intent and telemetry data, environmental forecasts and contingency tools into the operational picture, the solution supports continuous situational awareness, rapid decision-making and coordinated response across multiple FIRs. Automation support and secure data exchange ensure that updates can be propagated instantly to all affected stakeholders, minimising disruption to the network. Solution 2 aims to:

a) Integrate live STO mission-intent and telemetry data, including launch and re-entry profiles, into the NM situational display and mirror this to authorised ANSP and operator portals, with the ability to ingest HAPS status where operations overlap with STO corridors.

b) Incorporate space-weather and upper-atmosphere forecasts into real-time tools to support management of launches and re-entries, and share relevant forecasts with HAPS operators when their missions are conducted in affected airspace.

c) Maintain continuously updated 4-D hazard volumes for STO, including adaptive debris-footprint modelling for re-entries and anomaly events, and provide processes for rapid coordination where these volumes intersect with HAPS 4DOZ or other high-altitude activities.

d) Enhance contingency-management tools and associated ATC procedures to detect aircraft at risk from STO events, coordinate mitigation across affected FIRs, and maintain situational awareness for HAPS platforms if operating within or near impacted areas.

e) Establish a secure, digital data-exchange framework (API) for dynamic, cross-border coordination of STO, enabling NM, ANSPs and operators to share time-critical updates, while ensuring interoperability with HAPS where necessary.

f) Enable dynamic release of unused reserved airspace during STO missions and automate the update and publication of revised hazard geometries via SWIM and digital NOTAM, ensuring that other users, including HAPS when relevant, are promptly notified so that airspace returns to network use as early as possible.

While the principal focus of SPARTA is the management of Space Transport Operations, the project recognises that such operations cannot be treated in isolation. To manage STO safely and sustainably, the higher airspace must be treated as a continuous and finite resource. This requires that HAPS and other HAO users are considered as part of the overall traffic mix, so that their trajectories, operating zones and potential conflicts are accounted for in planning and execution. By including these actors in the solutions, SPARTA takes a holistic and comprehensive approach that ensures Europe’s ATM system can integrate STO while maintaining safe, efficient and equitable access to the higher airspace environment.

Ambition

Today, space launches and re-entries in Europe are managed largely through national procedures, ad-hoc NOTAMs, and manual coordination, leading to fragmented approaches, inefficient use of airspace, and uncertainty for operators. By contrast, SPARTA will deliver a harmonised European framework that integrates STO directly into the Digital European Sky, supported by automation, validated processes, and digital data exchange. The project will demonstrate how space operations can be planned and managed in the same systematic way as conventional traffic, reducing disruption to the network while maintaining safety and resilience.

The ambition also extends to the treatment of higher airspace as a managed but finite resource. Rather than viewing HAO and HAPS as outliers, SPARTA incorporates them into its solutions to ensure that the airspace above controlled flight levels is used equitably and efficiently. By providing TRL 6 specifications, validation results, and clear pathways for standardisation and regulation, SPARTA positions Europe to move from fragmented national practices towards a coherent, globally interoperable system for integrating space transport into ATM.

SPARTA builds directly on the results of ECHO and ECHO2, which have already demonstrated the feasibility of managing space launches in the European network and are expected to deliver an initial package of procedures and tools at TRL 6. While ECHO2 provides a solid baseline, its scope is limited to launch and re-entry operations. SPARTA widens this scope to include strategic and pre-tactical planning, collaborative decision-making (CDM) processes, and the interaction with higher airspace users such as HAO and HAPS. This expanded approach reflects the operational reality that space transport cannot be managed in isolation but must be integrated with all activities in the higher airspace environment.

Because SPARTA extends the domain beyond the narrower focus of ECHO2, the entry TRL for the project is necessarily lower to around TRL 2 for some parts. New elements such as planning frameworks, CDM processes, and the inclusion of HAO/HAPS have not yet been validated in an operational context. The ambition of SPARTA is therefore to bring this broader, comprehensive solution back up to TRL 6, producing a complete set of validated deliverables that are ready for standardisation, regulation and eventual deployment. This ensures continuity with past work while providing the step change needed for Europe to achieve a coherent, end-to-end framework for integrating space transport into the Digital European Sky.

#§PRJ-OBJ-PO§#

1.2 Methodology #@CON-MET-CM@# #@COM-PLE-CP@#

Overall methodology approach

SPARTA's methodology is built around the operational lifecycle of Space Transport Operations (STO), covering the phases from strategic and pre-tactical planning through to real-time mission execution and post-operations evaluation. By organising the work in this way, the project ensures that each stage of the lifecycle is addressed with appropriate methods, tools, and validation activities, while maintaining alignment so that all outputs contribute to a coherent, end-to-end capability for European airspace management.

The project is structured into two SESAR Solutions that reflect this lifecycle. The first addresses flexible and scalable mission planning, enabling the submission, assessment, and approval of STO missions with minimised impact on the wider network. The second covers dynamic real-time operations, ensuring that launches and re-entries can be monitored, hazard areas updated, contingencies managed, and unused airspace released quickly. Digital data exchange is a cross-cutting enabler embedded in both solutions, providing standardised channels for mission intent, hazard areas, and updates to flow between operators, ANSPs, States, and the Network Manager.

Development within each Solution follows an iterative cycle of concept definition, technical specification, prototype development, integration, and validation. Concepts and requirements will be refined with operational stakeholders, drawing on lessons from the ECHO2 project. Specifications will be captured using SESAR artefacts such as OSED, TS/IRS, and SPR-INTEROP, with validation activities planned and reported through VALP and VALR. Prototypes will be developed early against agreed interface definitions, ensuring compatibility with SWIM, FF-ICE, and relevant ICAO/EUROCAE standards, allowing integration and interoperability testing to begin at an early stage. Validation will then progress from simulations and controlled testing to shadow-mode trials in

representative operational environments.

The ambition of SPARTA lies in its scope. ECHO2 is expected to deliver TRL 6 outputs for a narrowly defined set of launch and re-entry processes. SPARTA widens this scope to include planning frameworks, collaborative decision-making, digital data exchange, and the treatment of higher airspace as a finite and managed resource, including the interaction with HAO and HAPS. Because of this expanded domain, the entry point for SPARTA is TRL 3–4, but the project aims to bring this comprehensive solution back up to TRL 6 by the end of its lifecycle. This ambition demonstrates continuity with earlier work while advancing towards a fully validated, interoperable framework for integrating STO into the Digital European Sky.

Outputs will be prepared in model-based and textual formats consistent with SESAR architecture processes, ensuring traceability into the European ATM Master Plan. They will be suitable for submission to ICAO, EUROCAE, and the EUR STO Project Team, providing a direct pathway into standardisation, regulation, and industrialisation. By grounding the methodology in the operational lifecycle and maintaining a strong focus on integration from the start, SPARTA will deliver deployable, consistent, and interoperable operational solutions that meet the performance and safety requirements of the future European airspace environment.

Methodology for Solution 1 – Flexible and Scalable Mission Planning

The planning phase is where the safe integration of STO into the European network is determined. Solution 1 addresses the strategic and pre-tactical phases, ensuring that missions can be submitted, analysed, coordinated, and approved with procedures that are both standardised and scalable.

The first step is the development of operational scenarios that reflect the different mission profiles and airspace impacts to be managed. These scenarios will describe roles and responsibilities for operators, ANSPs, NM, and States, and will capture the interactions needed to agree airspace reservations or 4D Operating Zones (4DOZ). Special attention will be given to the negotiation of launch and re-entry hazard areas, and to the representation of HAPS swarms or long-duration loitering missions that may overlap with STO corridors. These scenarios will be consolidated in the OSED, which serves as the operational baseline for all subsequent requirements.

Building on this, the project will prepare a Functional Requirements Document (FRD) to support traceability of operational needs into system behaviour. Although not part of the mandatory TRL 6 package, the FRD will help maintain consistency across the specifications. The TS/IRS will then define the functional behaviour and logical interface requirements, setting out how mission planning data is exchanged between operators, NM, ANSP systems, and other stakeholders. Interfaces will be described in terms of message types, timing, and services, leaving implementation open for later industrialisation. Harmonisation with SWIM services, FF-ICE concepts, and CCSDS/ICAO data models will be ensured so that submissions and updates are machine-readable and interoperable across borders.

The SPR-INTEROP will consolidate safety, performance, and interoperability requirements derived from the OSED and TS/IRS. This will include transversal assessments such as safety assurance and human performance, and a performance assessment report demonstrating how key performance areas and indicators are supported. The methodology requires these assessments to be explicit and traceable into the validation results and cost-benefit analysis.

Development will be carried out in an iterative cycle, with draft versions of OSED, TS/IRS, and SPR-INTEROP prepared well ahead of formal reviews. This enables early internal reviews and technical workshops with stakeholders, including NM, ANSPs, and regulators, reducing the risk of late-stage changes. Prototypes of mission planning interfaces and data exchange services will be developed against these draft specifications, allowing integration testing in controlled environments from the first reporting period.

Validation activities are central to Solution 1. The Validation Plan (VALP) will define objectives, scenarios, KPIs, data sources, and facilities to be used. Planned exercises include negotiation of 4DOZ volumes between operators and NM, assessment of alternative trajectories around predicted re-entry hazard areas, and submission of HAPS

swarms using adapted FF-ICE formats. These exercises will be executed using shadow/test platforms, with results captured in the Validation Report (VALR). Validation evidence will feed back into updates of the OSED, TS/IRS, and SPR-INTEROP, ensuring that the specifications evolve in line with operational reality.

The TRL progression for Solution 1 begins from TRL 3–4, as only parts of the planning process were addressed in ECHO2. By the end of the first reporting period, SPARTA will have baseline specifications and initial validation evidence. By the project conclusion, the complete TRL 6 package will be delivered, including OSED, TS/IRS, SPR-INTEROP, VALP/VALR, CBA, STAND, REG, and the Contextual Note (CN).

This methodology ensures that planning for STO is not treated in isolation but as part of a wider managed use of higher airspace. The solution is designed to ensure launches and re-entries can be accommodated with predictable and transparent processes, while maintaining flexibility to account for HAPS and other high-altitude users where interactions occur.

Methodology for Solution 2 – Dynamic Real-Time Operations

The execution phase of STO presents the most acute challenges for the ATM system. Once a launch or re-entry begins, airspace hazards evolve rapidly, contingencies must be managed in real time, and unused volumes must be released as soon as possible to restore network capacity. Solution 2 develops the procedures, tools, and data services that allow NM, ANSPs, and States to maintain situational awareness, coordinate dynamically, and respond effectively to both nominal and off-nominal events.

Work will begin with the development of operational scenarios describing the real-time coordination processes. These will capture the roles of launch operators, NM, ANSP tactical units, and State authorities during mission execution, including the timing of hazard updates, communications channels, and contingency triggers. Special attention will be given to scenarios involving anomalies such as trajectory deviation, debris events, or uncontrolled re-entry, and to the interaction between STO hazard volumes and concurrent HAPS operations in 4DOZ. These scenarios will be recorded in the OSED, which provides the operational baseline for safety, performance, and interoperability requirements.

A Functional Requirements Document (FRD) will be prepared to ensure traceability between operational needs and system functions, even though it is not part of the formal TRL 6 set. The TS/IRS will specify the functional behaviour and logical interfaces for real-time coordination, defining how mission telemetry, hazard updates, and contingency alerts are exchanged between operator systems, NM, ANSP tactical tools, and affected users. This will cover message content, update rates, and service discovery, ensuring alignment with SWIM services, ICAO data models (FIXM, AIXM, iWXXM), and CCSDS formats where relevant. The emphasis will be on machine-to-machine integration that allows near-instantaneous propagation of updates across FIR boundaries.

Safety, performance, and interoperability requirements will be consolidated in the SPR-INTEROP, ensuring that real-time processes are justified against defined key performance areas (safety, capacity, environment, cost efficiency) and that transversal assessments such as safety assurance and human performance are included. This ensures that tools and procedures are not only technically sound but also operationally acceptable for controllers and managers.

Development will follow an iterative cycle, with early drafts of OSED, TS/IRS, and SPR-INTEROP ready for the Technical Project Review. Prototypes of real-time coordination interfaces, situational displays, and contingency tools will be implemented against these draft specifications, enabling early integration testing in shadow/test platforms that replicate NMOC functions. Live operational systems will not be used, in order to avoid procedural, security, and stability risks, but the shadow environments will be sufficient to demonstrate representative data flows and coordination.

Validation activities will be defined in the VALP, with scenarios covering nominal launches, controlled re-entries, uncontrolled re-entries, debris events, and anomalies requiring rapid hazard-area adjustments. Additional scenarios

will explore the release of reserved airspace during missions, and the coordination between multiple HAPS in a 4DOZ and a concurrent STO launch corridor. Execution will produce the VALR, consolidating results, KPI performance, and recommendations. Feedback loops will allow updates to the OSED, TS/IRS, and SPR-INTEROP as validation evidence accumulates.

TRL progression for Solution 2 starts from TRL 4, as ECHO2 provides a foundation for hazard-area coordination but does not cover the full scope of dynamic real-time operations. By the end of the first reporting period, SPARTA will have baseline specifications and initial validation scenarios. By project end, the complete TRL 6 package will be delivered, including OSED, TS/IRS, SPR-INTEROP, VALR, CBA, STAND, REG, and the Contextual Note (CN).

This methodology ensures that real-time management of STO is underpinned by automation and secure data exchange, reducing controller workload and minimising disruption to other traffic. By embedding HAPS and other high-altitude users into the scenarios where they overlap with STO, the solution reflects the reality of a finite higher airspace environment and provides the tools to manage it as part of the wider European ATM system.

Cross-Cutting Enablers

Although the two Solutions address different phases of the lifecycle, they are connected through common enablers that ensure coherence, interoperability, and maturity progression.

Digital data exchange is the primary cross-cutting element. Mission intent, trajectory updates, hazard area definitions, and contingency alerts will all be exchanged via secure, standardised digital interfaces (API) based on harmonised data models. This approach allows information to flow automatically and consistently between operators, NM, ANSPs, States, and—where relevant—international partners. The methodology ensures alignment with SWIM services, ICAO standards (FIXM, AIXM, iWXXM), and CCSDS specifications, enabling interoperability across domains. By embedding data exchange within both planning and real-time operations, SPARTA avoids duplication and ensures that all information flows are coherent end to end.

Integration into SESAR architecture provides the second unifying thread. Each Solution will produce model-based and textual content in accordance with SESAR processes, ensuring that artefacts such as OSED, TS/IRS, and SPR-INTEROP are traceable within the European ATM Master Plan. This guarantees that project outputs are not stand-alone prototypes but directly contribute to programme-level architecture.

Validation methodology is also consistent across both Solutions. All validation will be planned in advance through a structured Validation Plan (VALP) and reported in a Validation Report (VALR). Scenarios will progress from controlled simulations to shadow-mode trials in representative operational environments. Live operational systems will not be used, to avoid stability and security risks, but test platforms will replicate NMOC functions sufficiently to demonstrate interoperability and data flows. This iterative validation loop allows early drafts of deliverables to be refined and aligned with evidence before finalisation.

TRL progression provides the overarching ambition. The starting point for SPARTA is TRL 3–4, as the expanded scope includes planning frameworks, collaborative decision-making, and HAO/HAPS interactions not covered in ECHO2. The methodology is explicitly designed to bring this broader scope to TRL 6 by project end, ensuring that the complete set of SESAR artefacts—OSED, TS/IRS, SPR-INTEROP, VALP/VALR, CBA, STAND, REG, and Contextual Note—are validated and ready for regulatory and industrial uptake.

Together, these enablers ensure that while the Solutions address distinct operational phases, they remain fully aligned in terms of data, specifications, validation, and maturity. This guarantees that the final outcome will be a coherent, deployable capability for managing STO within the Digital European Sky.

1.3 State of the art

The integration of Space Transport Operations (STO) and Higher Airspace Operations (HAO) into the European network is maturing but uneven. Good practice exists, yet implementations remain fragmented across States, with a mix of manual coordination, non-standard data formats, and limited automation for cross-border activities.

Important advances have been made through regional guidance and early prototypes (e.g. work feeding into the ICAO EUR context and SESAR demonstrators such as ECHO2). These efforts have proven feasibility, but they have not yet been extended into widely adopted, interoperable capabilities.

At present, there is no consistently implemented European solution that covers the full mission lifecycle—from coordinated planning and approval through real-time monitoring, dynamic hazard management, and automated cross-border data exchange—using harmonised, machine-readable information.

SPARTA addresses this gap by extending the most advanced concepts and prototypes in scope, technical maturity, and operational integration to deliver two distinct yet interconnected SESAR Solutions (planning and real-time operations), underpinned by a common, standards-aligned data-exchange layer. This approach focuses on practical interoperability and adoption without overstating current shortcomings.

Solution 1: Flexible and Scalable Mission Planning

Current state of the art

Mission planning for STO/HAO remains heterogeneous. Procedures, formats, and timelines differ between States; submissions are often PDFs or free-text, coordinated via email and teleconferences. Cross-border planning can be slow and inconsistent. Some national portals exist, but schemas are not harmonised and machine-readability is limited.

How SPARTA goes beyond

SPARTA will deliver a standardised, interoperable planning capability for orbital, sub-orbital and long-endurance high-altitude missions, including State operations. Planning will incorporate automated generation of time-bounded 4D hazard volumes (4DOZ) within the workflow, allowing early optimisation to minimise network disruption.

Key advances:

- Harmonised data schemas and APIs, aligned with European information-management practices, enabling machine-to-machine submissions as well as a web front end.
- Ingestion from existing operator/authority portals where available, avoiding duplicate entry and leveraging authoritative sources.
- Collaborative, multi-State decision-making built in from the outset, with clear roles, auditability and traceability.
- Pre-tactical digital outputs (including digital notice preparation and machine-readable hazard data) consumable by ANSP and network systems without requiring immediate modifications to existing Flight Data Processing systems.

This moves planning from narrative, document-centric exchanges to a data-centric, automatable process that is directly reusable by operational systems.

Solution 2: Dynamic Real-Time Operations

Current state of the art

During execution, many operations rely on pre-published static hazard areas and manual updates when conditions change. Revised notices and phone coordination can take tens of minutes and may not propagate evenly. Some isolated implementations display live mission data, but network-wide, standardised data services are not yet in place.

How SPARTA goes beyond

SPARTA provides a fully integrated real-time operational capability for STO/HAO, including State operations. Multiple surveillance/telemetry sources and environmental inputs are fused into a shared operational picture across ANSP and network environments.

Key advances:

- Continuous, predictive–responsive updates of 4DOZ based on debris/dispersion modelling and refined with live tracking, enabling dynamic footprint optimisation and early release where safe.
- Automated, secure dissemination of mission status, trajectory updates and hazard volumes via the standardised data-exchange framework, ensuring near-instant availability to all authorised stakeholders.
- Machine-readable digital notices (including digital NOTAM outputs) and SWIM-based messages for direct system ingestion—reducing manual re-entry and propagation lag.
- Automated risk detection against active flight trajectories, with decision support for mitigation and coordinated updates across affected FIRs.

This shifts day-of-ops from fragmented, phone-and-PDF workflows to timely, data-driven coordination at network scale.

#§CON-MET-CM§# #§COM-PLE-CP§# #§REL-EVA-RE§#

2. Impact #@IMP-ACT-IA@#

2.1 Project's pathways towards impact

The growing frequency and complexity of Space Transport Operations (STO) and Higher Airspace Operations (HAO) presents both opportunities and challenges for European airspace management. Existing procedures are fragmented between States, heavily reliant on manual coordination, and lack the standardisation and automation needed to manage these activities efficiently at a network scale. This limits the ability to integrate missions seamlessly into the European ATM system, often resulting in conservative airspace restrictions, unpredictable impacts on traffic flows, and increased workload for operational staff.

SPARTA addresses these challenges through two complementary SESAR Solutions that together cover the full operational lifecycle of STO and HAO integration. The first focuses on the planning phase, providing a standardised, collaborative process that improves the quality and timeliness of mission data. The second delivers a real-time operational capability, enabling continuous monitoring, automated hazard updates, and proactive conflict management during missions. Both Solutions are underpinned by a secure, standardised data-exchange framework that ensures information flows automatically and consistently between all relevant stakeholders, within Europe and with adjacent regions.

Each Solution has a distinct operational role, yet they are designed to work as an integrated whole. The planning capability feeds directly into real-time operations, and both rely on the common data-exchange framework to distribute updates rapidly and accurately. Together they deliver measurable improvements in safety, predictability, and network efficiency, while providing a clear pathway for adoption into operational and regulatory frameworks.

This integrated approach ensures that SPARTA's results will not only address current operational gaps but also position Europe as a global leader in managing space launch and re-entry activities and high-altitude operations

Solution 1 – Flexible and Scalable Mission Planning

Operational and safety impact

Operational and safety impact

Today, STO and HAO mission planning in Europe is heterogeneous. States apply different approval formats, lead times and coordination processes, which creates unpredictable workflows and variability in how hazard areas are defined. Where uncertainty is high, stakeholders sometimes adopt large precautionary airspace closures to manage risk, which can displace traffic more than necessary. SPARTA addresses this by providing a single, harmonised planning environment that lets all stakeholders, including State Space Regulators, ANSPs, the Network Manager and mission operators, work from a consistent and authoritative mission dataset for use within the European ATM context. The solution embeds collaborative decision-making in the planning phase. By engaging all affected States early, potential conflicts can be identified and resolved pre-tactically, and hazard volumes can be shaped with greater precision to minimise footprint while meeting safety requirements. Standardised, electronic planning reduces opportunities for error, improves traceability and helps ensure that approvals are based on complete and consistently structured data as provided by the responsible parties. This reduces the likelihood of late procedural changes during the mission itself.

Network performance benefits

From a network perspective, more predictable and precise hazard volumes enable more efficient use of airspace. Airlines and flight planners can plan with greater confidence, with better opportunities to avoid knock-on congestion in neighbouring sectors where applicable. SPARTA supports the Network Manager and States in assessing mission impacts against demand patterns and critical flows, helping to identify lower-impact windows or shapes where mission constraints allow. It does not schedule missions and cannot override State or mission-critical timing requirements; rather, it provides pre-tactical what-if analysis, impact visualisation and data products that enable earlier, more informed decisions. The automated hazard-volume function is significant. Using trajectory modelling and re-entry dispersion predictions, the system can propose targeted geometries derived directly from mission parameters. This can reduce planning time and, where safety allows, enable smaller, better-shaped volumes, improving safety by bounding risk more precisely.

Regulatory and interoperability impact

Regulatory oversight currently requires each State to interpret and validate operator plans in its own way. The absence of a common, machine-readable format increases translation effort and the risk of misinterpretation. SPARTA establishes a harmonised mission-plan schema and interfaces aligned with European information-management practices and compatible with SWIM profiles and FF-ICE concepts where appropriate. STO and HAO-specific parameters are supported through well-defined extensions, units and ranges to ensure clarity at high speeds and altitudes. This allows authorities to receive structured data, making approvals more transparent and less resource-intensive. Interoperability extends beyond Europe through the use of internationally recognisable exchange patterns, enabling data sharing for cross-border missions without imposing ownership of "master data" outside the European ATM context.

Why this is transformative

This solution goes beyond current practice by combining automation, standardisation and collaborative planning in one operational capability. No current European system delivers automated hazard generation, multi-State pre-tactical workflows and consumable, machine-readable outputs designed for direct ingestion by operational environments. The result is shorter and more predictable planning cycles, more precisely bounded hazard areas, fewer operational disruptions and clearer accountability and traceability. By addressing safety, efficiency and interoperability together, Solution 1 helps make STO and HAO missions a routine, low-impact part of European airspace operations rather than exceptional events requiring heavy manual coordination.

Solution 2 – Dynamic Real-Time Operations

Operational and safety impact

Even with a fully developed mission plan, STO and HAO operations can change once they begin. Delays, minor trajectory deviations or environmental conditions may alter the hazard footprint and timing. In the current European context, such changes are managed mainly through manual coordination using telephone calls, email and revised notices. Updates can take several minutes to propagate across all affected parties, creating a window where ATC may be working with information that is no longer current. In response, controllers may apply larger or longer restrictions than strictly necessary, which protects safety but can affect more of the network than required.

SPARTA's real-time operations capability addresses this by fusing operator-provided mission data with surveillance and environmental inputs into a unified operational picture available to the Network Manager and affected ANSPs. Sources can include ground radar and optical tracking, space-based ADS-B and space-weather forecasts. This fusion provides a timely view of the actual trajectory and predicted changes based on current conditions, supporting quicker, more consistent safety decisions. The capability also reduces and helps manage potential conflicts arising from HAO activity, particularly where high-altitude operations intersect with conventional flows or require dynamic re-planning.

Network performance benefits

A key innovation is automated hazard-volume updating. As the mission progresses, predictive debris and trajectory models forecast the hazard footprint and are refined continuously using live tracking. Resulting geometries are tailored in time and space to the evolving risk, replacing static, pre-published areas with dynamic ones. This enables restrictions to be lifted as soon as they are no longer needed and helps avoid closing unaffected areas. The system also provides automated conflict detection by comparing updated hazard volumes with active aircraft trajectories. When a potential conflict is identified, decision-support proposals such as targeted reroutes or temporary flow measures are generated for controller review and implementation.

While current, measurable delays attributable to HAO are limited in Europe, the above capabilities improve the efficient use of higher airspace and reduce the risk of unnecessary restrictions as activity scales. Where STO missions interact with the network, earlier, more precise updates help avoid knock-on effects in adjacent sectors.

Regulatory and interoperability impact

The real-time picture is designed to integrate with NM and ANSP environments, as well as operator control centres, so that all decision-makers access the same authoritative data. Formats align with European SWIM specifications and ICAO provisions for sharing hazard information, supporting coordination with neighbouring Regions where appropriate. Security, access control and integrity checks are embedded. The service produces a detailed, time-stamped record of mission status, hazard-volume changes and actions taken, supporting post-event reviews, regulatory oversight and continuous improvement of procedures.

Why this is transformative

There is currently no European operational capability that combines live mission-data integration, automated hazard-geometry updates, real-time conflict detection and network-wide distribution. SPARTA shifts mission management from largely reactive, document-based exchanges to a predictive, responsive and coordinated process at network scale. By enabling faster, more accurate and less disruptive hazard management, the solution strengthens safety and improves overall efficiency where missions interact with the network, while establishing a model that can be scaled as STO and HAO activity grows.

2.2 Measures to maximise impact - Dissemination, exploitation and communication #@COM-DIS-VIS-CDV@#

The impact of SPARTA will depend on more than the technical quality of its outputs. To achieve lasting change in the way Space Transport Operations (STO) and Higher Airspace Operations (HAO) are managed, the project must ensure that its results are understood, trusted, and adopted by the operational, regulatory, and industrial communities that will use them. This requires a coordinated approach that begins on day one and continues beyond the project's formal end.

SPARTA's dissemination, exploitation, and communication plan addresses this requirement through three parallel strands of activity. Dissemination will ensure that results reach the right audiences in the right formats to enable uptake. Exploitation will focus on embedding the solutions in operational systems, regulatory frameworks, and industry standards. Communication will build awareness and support among both specialist and non-specialist audiences, highlighting the benefits for safety, efficiency, and sustainability.

These activities are reinforced by structured engagement with ICAO, EASA, EUROCAE, and other standardisation bodies, as well as alignment with relevant international frameworks such as those developed by the Consultative Committee for Space Data Systems (CCSDS). By maintaining this alignment and targeting outputs to the needs of each audience, SPARTA will maximise the likelihood that its solutions move rapidly from project deliverables to operational reality.

Dissemination strategy

The dissemination plan ensures that SPARTA's outputs are visible, accessible, and usable for those who can turn them into operational reality. Dissemination will begin at the project outset and continue well beyond its conclusion, with targeted actions for each phase of work.

SPARTA's results will be shared with operational stakeholders such as the Network Manager, ANSPs, State Space Regulators, and mission operators, who will directly use the Solutions. For these groups, the emphasis will be on practical, implementable outputs: technical specifications, operational procedures, validation findings, and interface documentation in forms that can be integrated into existing systems.

Regulatory and standardisation audiences, including ICAO EUR/NAT, the ATMOPS and Space Operations Panels, and relevant EUROCAE working groups, will receive outputs in the formats they require for adoption. This includes formal working papers, draft provisions, and detailed data model descriptions suitable for incorporation into ICAO guidance or EUROCAE standards. By maintaining an active presence in these bodies throughout the project, SPARTA will align its results with ongoing work, ensuring that outputs can move quickly into formal processes.

The research and innovation community, including SESAR partners and academic specialists in ATM, space operations, and data exchange standards (EUROCAE/CCSDS), will be engaged through conference presentations, open-access reports, and technical papers. Making selected deliverables publicly available in trusted repositories will enable further development and interoperability testing.

SPARTA will also share results with partners in adjacent ICAO Regions, through bilateral meetings and contributions to cross-regional forums such as CANSO working groups. Given the cross-border nature of many STO and HAO missions, these exchanges will help ensure that European procedures remain interoperable with neighbouring regions and influence global best practice.

Dissemination will use a mix of established and project-specific channels. These include participation in SESAR Innovation Days, ICAO EUR/NAT and CANSO events, dedicated SPARTA stakeholder workshops, technical webinars, and targeted briefings for priority audiences. Dissemination timing will be aligned with project milestones: early sharing of concepts to gather feedback, mid-project release of prototypes and validation results, and final publication of the fully validated Solutions.

By engaging each audience in ways suited to their role and decision-making processes, SPARTA will create the conditions for its results to be understood, trusted, and adopted.

Exploitation strategy

The exploitation plan focuses on turning SPARTA's results into operational capabilities, regulatory provisions, and industry standards that will continue to deliver value after the project ends. From the outset, exploitation activities will run in parallel with technical work so that potential users can begin preparing for adoption while the Solutions are still in development.

For operational stakeholders, the two Solutions will be prepared for direct integration into the Network Manager's planning and operational systems, ANSP tools, and mission operator workflows. This includes aligning software interfaces with existing infrastructure, providing detailed operational guidance, and conducting pre-deployment trials within live environments where possible. By the end of the project, at least one operational partner will have an agreed pathway for early implementation of each Solution.

For regulators and standardisation bodies, the exploitation objective is to have SPARTA outputs ready for formal consideration within ICAO and EUROCAE processes. This means producing the necessary supporting material—draft provisions, technical recommendations, and reference implementations—so that the Solutions can be taken forward without the need for major rework. The project will also prepare detailed change proposals for inclusion in ICAO regional documentation and EUROCAE specifications.

Each partner will develop an internal exploitation plan identifying how they will use the results within their own organisations, whether for operational deployment, commercial services, or further research. These individual plans will be consolidated into a project-wide exploitation roadmap, which will be updated regularly and delivered as a formal output.

Post-project sustainability is a central element of the exploitation approach. By embedding the Solutions into ongoing operational, regulatory, and standardisation workstreams during the project, SPARTA ensures that they will be maintained, refined, and used well beyond the project lifetime.

Communication strategy

Communication activities will ensure that SPARTA is visible, recognisable, and understood by both specialist and non-specialist audiences throughout its lifetime. The aim is to build awareness of the project's objectives, demonstrate progress, and highlight the benefits of its results for the European ATM network and wider society.

A public-facing website will be established early in the project as the central hub for all communication activities. It will include accessible explanations of the project's purpose, news updates, event announcements, and links to public deliverables. The site will be maintained for at least two years after the project ends to support continued access to information.

SPARTA will adopt a consistent visual identity, applied across all presentations, documents, and online content. This will help establish a clear and recognisable presence at industry events and in professional networks. Communication materials will be adapted to the audience, with technical depth for professional stakeholders and plain language for broader public outreach.

Throughout the project, a programme of events and media activities will support visibility. Key actions will include:

a) A public launch announcement and media kit at the project start.

b) A mid-project stakeholder event to present interim results and gather feedback.

c) A final results conference to showcase validated Solutions and outline adoption pathways.

d) Regular briefings at industry events such as SESAR Innovation Days, ICAO EUR/NAT meetings, and EUROCAE symposia.

Digital channels will be used to extend the project's reach. A LinkedIn page will provide regular updates for the professional ATM and space operations community, while targeted articles will be placed in relevant industry publications. Where appropriate, social media posts will link back to the project website to encourage deeper engagement.

The communication programme will run from the first month of the project, ensuring that awareness grows steadily and stakeholders remain engaged. By maintaining a consistent flow of information and aligning messages with project milestones, SPARTA will keep its audience informed and invested in the results.

Intellectual property rights (IPR) and results ownership

SPARTA will generate a range of results, including technical specifications, software prototypes, validation methodologies, operational procedures, and guidance material. The consortium will manage intellectual property in a way that protects individual contributions while ensuring the widest possible uptake of the results.

An IPR framework will be agreed in the Consortium Agreement before the project start. This will define ownership rules, access rights, and conditions for both internal use and external exploitation. Results created by a single partner will remain the property of that partner. Results developed jointly will be owned collectively, with clear arrangements for use and decision-making agreed in advance.

The project will distinguish between outputs intended for open publication and those requiring controlled access. Public deliverables such as non-sensitive specifications, operational guidance, and performance assessments will be released under open licences to support adoption and interoperability. Software components that form part of interface implementations may also be made available under permissive licences where this would accelerate uptake.

For results containing commercially sensitive or security-critical information, access will be restricted to authorised stakeholders under agreed conditions. In such cases, the consortium will determine the most appropriate protection mechanism, which may include copyright, design rights, or, where relevant, patent applications.

A results ownership register will be maintained throughout the project, updated at each reporting period, and finalised in the closing stages. This register will clearly identify each result, its owner or owners, the protection status, and the intended exploitation pathway.

By establishing these arrangements early and updating them as the project progresses, SPARTA will ensure that intellectual property is managed in a way that safeguards the partners' contributions and facilitates the operational adoption of its outputs.

Policy feedback and standardisation pathway

SPARTA is designed to produce results that can be deployed operationally and considered within regulatory frameworks and industry standards. From the outset, the project will make its technical specifications, validation evidence, and implementation guidance available in formats suitable for uptake by the responsible bodies at European and international levels.

At the international level, information sharing with ICAO will be channelled through established liaison routes (e.g. the EUR/NAT Office) and, where appropriate, via relevant technical bodies. SPARTA will prepare materials in ICAO-friendly formats, such as draft guidance notes and inputs suitable for consideration in regional documentation. Any potential contributions towards future SARPs would be offered as background material only, leaving initiation and stewardship to ICAO processes.

At the European level, SPARTA will ensure that outcomes are compatible with existing and emerging provisions on airspace usage, data services, and safety management. Briefing packs and targeted technical notes will be made available to EASA on request and via the Advisory Board, enabling alignment with AMC/GM where relevant. Participation in any EASA activities would be contingent on invitation and within project scope; the consortium does not assume standing membership or resourcing of task forces.

For standardisation, SPARTA will package interface definitions and validation evidence so they are candidate inputs for consideration by the appropriate EUROCAE working groups, where active and relevant to higher airspace operations, SWIM-based data exchange, or integration of new entrants. Where concepts from adjacent domains (for example U-space information services) have applicability to segregated high-altitude environments, this will be highlighted carefully without implying transfer where it is not appropriate to STO or high-speed operations.

In developing its data exchange layer, SPARTA will reference widely used space-domain data recommendations, including those published by the Consultative Committee for Space Data Systems (CCSDS), to promote interoperability of formats, metadata and protocols. The intent is compatibility and clear mapping between spaceflight data and SWIM-enabled ATM environments. SPARTA does not plan to propose formal changes to CCSDS specifications; any observed gaps or alignment issues will be documented and shared with the custodians as informational feedback.

Feedback from SPARTA's validation activities will be consolidated into concise technical recommendations that describe performance, operational constraints, and any enabling regulatory considerations. These recommendations will be made available to ICAO, EASA, EUROCAE, national regulators and relevant standards communities, supporting evidence-based consideration without pre-judging policy choices.

The pathway to adoption begins early, with a liaison plan that maps processes and indicative timelines of the relevant organisations. Draft materials may be shared for comment ahead of final validation where this can improve alignment. This approach maximises the likelihood that SPARTA outputs are ready for formal consideration, while keeping external engagement proportionate and within project scope

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2.3 Summary

KEY ELEMENT OF THE IMPACT SECTION

SPECIFIC NEEDS	EXPECTED RESULTS	D & E & C MEASURES
What are the specific needs that triggered this project? The specific needs that triggered this project are centred around addressing the current operational, technical, and regulatory gaps in managing STO and HAO. These gaps include fragmented and manual planning processes, lack of situational awareness and updates during real-time operations, and lack of standardized and secure data exchange mechanisms. If these needs remain unaddressed, they will lead to increased delays, network inefficiencies, limited ability to handle the increasing number of STO/HAO, and inconsistent cross-border coordination.	What do you expect to generate by the end of the project? Deployable, interoperable operational concepts, procedures, and technical enablers ready for industrialization. Tools, procedures, regulatory, and data exchange frameworks for the NM, ANSPs, Regulators, and Operators to plan, monitor, and adapt to STO and HAO activities before and during flight. These include a Flexible and Scalable Mission Planning capability, Dynamic Real-time Operations, and Standardized and Secure Data Exchange. Enable Europe to facilitate the seamless integration of expected STO and HAO, maintaining safety and minimizing impacts on other airspace users. Support European leadership in global STO and HAO interoperability and standardization, ensuring compatibility within ICAO EUR and beyond. A validated pathway to integrate these capabilities into the Digital European Sky target architecture and trajectory-based operations.	What dissemination, exploitation and communication measures will you apply to the results? Communication methods will include: a) A public project website b) Participating in and providing papers for SESAR events, ICAO EUR/NAT meetings, EUROCAE working groups, specialised industry conferences, and selected journals. c) Sharing updates through SESAR 3 JU channels. Dissemination activities will include: a) Technical deliverables and reports. b) Conference papers and peer-reviewed journal articles. c) Presentations to operational forums and technical panels. d) Workshops and webinars to engage stakeholders in the review of preliminary and final results. The exploitation plan will include: a) Mapping solution outputs to candidate standardisation and regulatory processes. b) Identifying opportunities for integration into NMOC processes, ANSP planning systems, and mission operator workflows. c) Assessing the operational, regulatory, and commercial viability of each solution in consultation with end users. d) Ensuring exploitation considerations are addressed in both the first and second reporting periods, with early market and regulatory engagement to prepare the ground for implementation.

TARGET GROUPS

Who will use or further up-take the results of the project? Who will benefit from the results of the project?

Within the operational world the results of SPARTA will be used by NM, ANSPs, Space and Airspace Regulators, STO and HAO Operators, and the military.

Operational beneficiaries will include the above, plus other Airspace Users, whose operations are not as adversely impacted by STO and HAO.

Other beneficiaries will be European citizens and companies who benefit from:

1) The services offered by STO and HAO.

2) The reduced disruption to current Airspace User activities (e.g. commercial scheduled aviation).

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OUTCOMES

What change do you expect to see after successful dissemination and exploitation of project results to the target group(s)?

Improved STO/HAO Coordination and Efficiency by adopting standardized and scalable mission planning processes will improve network efficiency, and potential capacity for STO/HAO missions.

Integrating enhanced real-time operational management capabilities will support timely and coordinated decisions during missions, reducing the risk of network disruption and improve safety by enabling dynamic adaptation to evolving operational conditions.

Implementation of a Standardized and Secure Data Exchange will ensure consistent and reliable information sharing between all relevant stakeholders. This will reduce errors, improve situational awareness, and facilitate cross-border coordination.

Support European leadership in global STO/HAO Regulatory and Standardization. This will ensure compatibility with ICAO EUR and cross-regional frameworks, positioning Europe as a global leader in managing space and high-altitude operations.

A validated pathway to integrate these capabilities into the Digital European Sky target architecture and trajectory-based operations environment will enable the seamless integration of STO and HAO while maintaining safety and minimizing impacts on other airspace users.

IMPACTS

What are the expected wider scientific, economic and societal effects of the project contributing to the expected impacts outlined in the respective destination in the work programme?

Advance the state of knowledge in the field of STO and HAO airspace integration by developing and validating new operational concepts, procedures, and technical enablers. This will contribute to the scientific community's understanding of how to manage these operations more effectively and safely.

Reduce delays and network inefficiencies, leading to cost savings for operators and service providers.

Facilitate the growth of STO and HAO in Europe, leading to new business opportunities and economic development.

Contribute to the safety and security of airspace operations by addressing the current gaps in managing STO and HAO, reducing the risk of accidents and incidents.

Improve the efficiency and predictability of airspace operations, delivering positive environmental effects, such as reducing fuel burn and associated emissions.

Support the development of a more resilient and adaptable airspace management system, benefiting society as a whole by ensuring the safe and efficient integration of new types of airspace users.

3. Quality and efficiency of the implementation #@QUA-LIT-QL@# #@WRK-PLA-WP@#

3.1 Work plan and resources

The SPARTA work plan is designed to deliver two SESAR Solutions, each addressing a distinct phase of Space Transport Operations (STO) integration into the European ATM system:

- Solution 1 – Flexible and Scalable Mission Planning: addressing strategic and pre-tactical phases, enabling structured mission submissions, hazard area definition, negotiation of 4D Operating Zones (4DOZ), and network-wide CDM processes.
- Solution 2 – Dynamic Real-Time Operations: addressing the execution phase, enabling live monitoring, adaptive hazard management, contingency response, and rapid release of unused airspace.

Data exchange is treated as a cross-cutting capability embedded in both solutions, rather than a separate work package. All requirements, specifications, and validation activities will include machine-to-machine interfaces, harmonised data models, and secure digital exchange mechanisms, ensuring consistency across planning and real-time phases.

Figure 1 visualises the SPARTA Work Breakdown Structure (WBS):

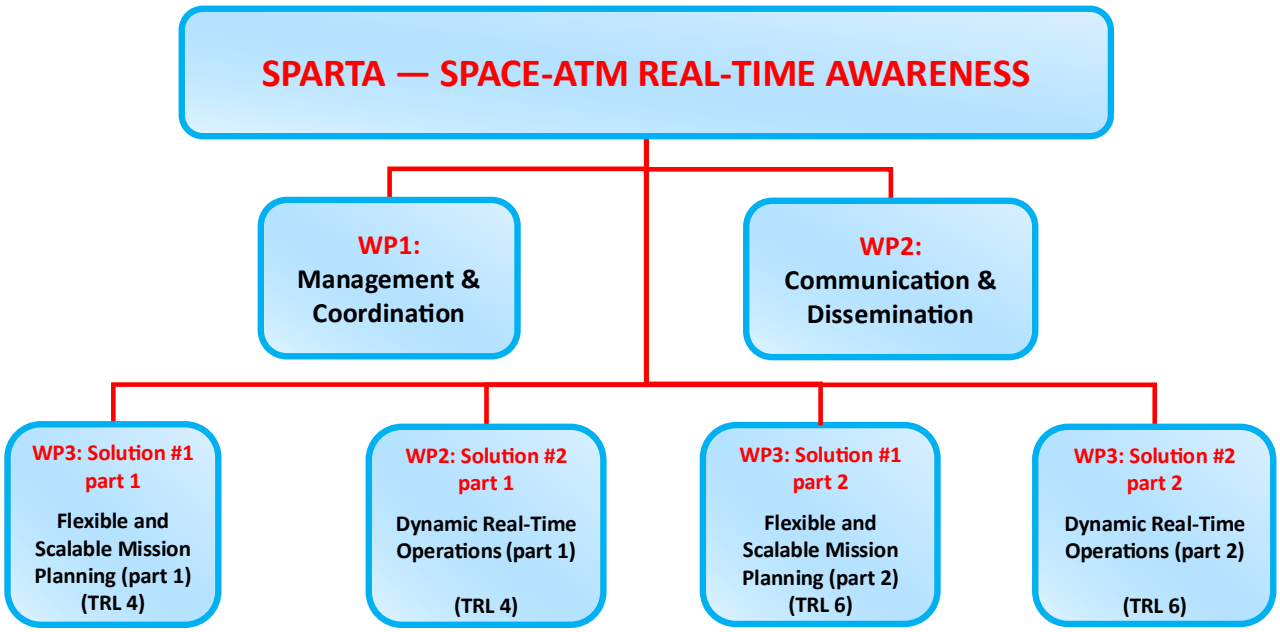

Figure 1: SPARTA WBS

Each solution is developed over two reporting periods, with a dedicated work package in each phase. This ensures that draft specifications and validation results can be prepared in time for SESAR reviews, allowing iterative improvement and reducing re-assessment risk.

WP1 – Project Management (M1–36) provides governance, financial and contractual oversight, and quality assurance for the project as a whole. It establishes the Project Management Plan, ensures timely delivery of all SESAR milestones and reviews, and maintains risk and issue registers. WP1 also runs the internal review cycle for all deliverables, ensuring both technical quality and compliance with SESAR formats before submission.

WP2 – Dissemination, Exploitation, Communication, and Data Management (M1–36) manages all stakeholder engagement and communication activities. It ensures that project results are shared with operators, ANSPs, States, and the wider community, through publications, workshops, and events aligned with technical milestones. It also maintains the project website, implements the visual identity, and prepares dissemination material for both technical and public audiences. WP2 additionally ensures that all project data and outputs are managed in line with FAIR principles, with a Data Management Plan (DMP) delivered and updated at required intervals.

WP3 – Solution 1 Planning (M1–18) initiates development of the planning solution, covering requirements capture, initial specifications, and early validation. It produces draft OSED, TS/IRS, and SPR-INTEROP to define how mission intent and hazard areas are submitted and managed. Prototypes of digital interfaces and planning services are developed to test interoperability with NM and ANSP systems. Initial validation scenarios are executed in simulation and controlled environments, with findings documented in the Validation Plan and early Validation Report.

WP4 – Solution 2 Operations (M1–18) develops the real-time coordination solution in parallel. It defines the operational scenarios and requirements for live monitoring, hazard volume updates, and contingency management, captured in draft OSED, TS/IRS, and SPR-INTEROP. Prototypes of tactical decision-support tools and situational displays are built to demonstrate data exchange with shadow NMOC platforms. Validation activities focus on representative scenarios such as launch anomalies, debris events, and rapid airspace release, with results recorded in draft VALP and early VALR.

WP5 – Solution 1 Planning (M19–36) refines and finalises the planning solution, building on the baseline deliverables from WP3. Specifications are updated based on validation results, and the final versions of OSED, TS/IRS, and SPR-INTEROP are delivered at TRL6. Validation activities are extended to cover cross-border coordination, long-duration missions, and integration with HAPS in 4DOZ. The Cost-Benefit Analysis (CBA) is produced, together with contributions to standardisation (STAND) and regulatory guidance (REG). The Contextual Note (CN) packages the planning solution for future industrialisation and deployment.

WP6 – Solution 2 Operations (M19–36) brings the operational solution to maturity. Specifications from WP4 are refined and finalised, with extended validation covering nominal launches, uncontrolled re-entries, and interaction with other higher airspace users. The final OSED, TS/IRS, and SPR-INTEROP are delivered at TRL6, supported by a comprehensive Validation Report. The CBA assesses the benefits of real-time coordination in terms of network efficiency and safety. Contributions to STAND and REG are prepared to support European and international uptake. The Contextual Note summarises the final solution and defines the path to deployment.

Timing and Sequencing

The project runs for 36 months, divided into two reporting periods, each supporting a full development and validation cycle for the two SESAR Solutions.

Months 1–6 (Project initiation): WP1 establishes governance, risk management, and reporting procedures. WP2 launches the project website and stakeholder engagement. WP3 and WP4 focus on requirements gathering, stakeholder workshops, and initial system architecture definitions, culminating in the Project Management Plan at Month 3. Early drafts of OSED and TS/IRS are prepared for both planning and operations solutions.

Months 7–12 (Early development): WP3 and WP4 produce draft SPR-INTEROP documents and begin prototype development of planning interfaces and operational coordination tools. Integration checkpoints ensure consistency across both solutions. WP2 supports outreach through technical workshops and first publications. Preparations are made for the Technical Project Review at Month 10, including delivery of draft specifications and early validation concepts.

Months 13–18 (Baseline validation): Initial validation exercises are conducted in WP3 and WP4, using simulations and shadow platforms to test mission submission, hazard area management, and contingency handling. Draft Validation Plans (VALP) and initial Validation Reports (VALR) are produced. By Month 18, each solution delivers baseline specifications (OSED, TS/IRS, SPR-INTEROP) and early validation evidence to support the first Periodic Report and SESAR maturity self-assessment.

Months 19–24 (Refinement and extended scenarios): WP5 and WP6 refine specifications based on validation

feedback, producing updated OSED, TS/IRS, and SPR-INTEROP. Validation scenarios are broadened to include cross-border launches, multi-ANSP coordination, and HAPS integration in 4DOZ. WP2 updates the Dissemination and Exploitation Plan and delivers the mid-project Data Management Plan update.

Months 25–30 (Operational validation): WP5 and WP6 conduct extended validation in operationally representative environments. Scenarios include nominal launches, uncontrolled re-entries, debris events, and dynamic airspace release. Draft final deliverables are prepared by Month 28 to support internal quality review and SESAR alignment checks.

Months 31–36 (Finalisation and closure): WP5 and WP6 deliver final TRL6 documentation, including OSED, TS/IRS, SPR-INTEROP, VALR, CBA, STAND, REG, and the Contextual Notes. WP1 prepares the Exit Maturity Gate package and final reports. WP2 organises the final dissemination event, consolidates exploitation planning, and submits the final CDE and stakeholder engagement reports. The project closes with delivery of all mandatory technical and non-technical outputs to SESAR 3 JU.

Interdependencies

The SPARTA work plan is structured to ensure that all work packages contribute to the delivery of two coherent SESAR Solutions, with strong alignment across planning and operational phases. Interdependencies are managed both vertically (between phases of the same solution) and horizontally (across solutions and cross-cutting WPs).

WP1 – Project Management provides overarching governance, scheduling, and quality assurance. It defines reporting cycles, chairs the Project Management Board and Technical Coordination Team, and ensures that all WPs deliver their outputs in line with SESAR 3 JU milestones. WP1 also manages the internal review process, ensuring consistency and quality before deliverables are submitted.

WP2 – Dissemination, Exploitation, Communication, and Data Management runs continuously, supporting all technical WPs by promoting results, maintaining stakeholder engagement, and applying the FAIR principles to data. WP2 ensures that draft deliverables from WP3–WP6 are made available to external stakeholders at the right time (for example, during SESAR reviews or validation workshops) and that feedback can be incorporated. WP2 also ensures that all final outputs are communicated beyond the consortium and positioned for uptake in standardisation and regulation.

WP3 and WP5 – Solution 1 (Planning) form a continuous workstream across both reporting periods. WP3 establishes the baseline requirements, draft specifications, and initial validation evidence, which are then refined and expanded in WP5. The outputs of WP3 (OSED, TS/IRS, SPR-INTEROP, VALP) directly feed into WP5, where validation evidence and extended scenarios support the delivery of the full TRL 6 package, including CN, CBA, STAND, and REG.

WP4 and WP6 – Solution 2 (Operations) follow the same pattern. WP4 develops the baseline specifications and prototype tools for real-time coordination, with early validation in simulated and shadow environments. These outputs provide the foundation for WP6, where specifications are finalised, extended validation is performed in representative conditions, and the complete TRL 6 package is delivered.

Coordination between Solutions is maintained throughout. WP3/5 and WP4/6 share interface requirements and data exchange definitions to ensure that planning outputs and real-time updates are consistent. Joint validation activities test interoperability across both phases, for example by linking a planned trajectory submission (WP3/5) with a real-time anomaly response (WP4/6). This cross-solution integration ensures that STO can be managed as a seamless end-to-end process.

Data exchange as a cross-cutting enabler links all technical WPs. Although not a stand-alone WP, specifications for digital interfaces, SWIM services, and harmonised data models are embedded in both planning and operations solutions. Validation of these exchanges is performed jointly across WP3/5 and WP4/6 to guarantee coherence.

This interdependent structure ensures that no work package operates in isolation. Each contributes to the overall objective of delivering two SESAR Solutions at TRL 6, while shared artefacts, common validation activities, and coordinated management processes guarantee consistency and reduce duplication.

Figure 2 visualises the SPARTA GANTT chart:

	Number	Deliverable name	Short description	Work package	Short name of lead participant	Delivery date (in months)
WP1	D1.1	Kick-off Meeting Report		1	EUROCONTROL	1
	MS1.1	Kick-off meeting held		1		1
	D1.2	Project Management Plan (PMP)		1	EUROCONTROL	3
	MS1.2	Project Management Plan approved		1		3
	D1.3	Data Management Plan (DMP)		1	EUROCONTROL	6
	MS1.3	End of Period 1 review package completed		1		18
	D1.4	Updated Project Management Plan (PMP)		1	EUROCONTROL	20
	MS1.4	Horizon Europe Review readiness confirmed		1		21
	D1.5	Updated Data Management Plan		1	EUROCONTROL	22
	D1.6	Final Data Management Plan		1	EUROCONTROL	32
	MS1.5	Exit maturity gate readiness confirmed		1		34
	D1.7	Final Project Report		1	EUROCONTROL	36
	MS1.6	Grant Agreement closure package submitted		1		36
WP2	D2.1	Communication & Dissemination Plan		2	SKYNAV	3
	D2.2	Project Website and Online presence		2	SKYNAV	3
	MS2.1	CDE Plan approved and website operational		2		3
	D2.4	Mid-project Stakeholder Workshop Report		2	EUROCONTROL	18
	MS2.2	Mid-project stakeholder workshop delivered		2		18
	D2.3	Updated CDE Plan		2	SKYNAV	20
	D2.5	End-project Stakeholder Workshop Report		2	EUROCONTROL	36
	MS2.3	Final stakeholder workshop delivered		2		36
WP3	D3.1	Initial OSED		3	SKYNAV	12
	D3.2	Initial TS/IRS		3	SKYNAV	18
	D3.3	Intermediate OSED		3	SKYNAV	18
	D3.4	Initial VALP		3	SKYNAV	18
	D3.5	Initial STAND		3	SKYNAV	18
	D3.6	Initial REG		3	ENAC IT	18
	MS3.1	Baseline specification package completed		3		18
WP4	D4.1	Initial OSED		4	EUROCONTROL	12
	D4.2	Initial TS/IRS		4	EUROCONTROL	18
	D4.3	Intermediate OSED		4	EUROCONTROL	18
	D4.4	Initial VALP		4	SKYNAV	18
	D4.5	Initial STAND		4	EUROCONTROL	18
	D4.6	Initial REG		4	ENAC IT	18
	MS4.1	Baseline specification package completed		4		18
WP5	D5.1	Final OSED		5	SKYNAV	30
	D5.2	Final VALP		5	SKYNAV	30
	D5.3	Final TS/IRS		5	SKYNAV	34
	D5.4	VALR		5	SKYNAV	34
	D5.5	Final STAND		5	SKYNAV	34
	D5.6	Final REG		5	ENAC IT	34
	MS5.1	Final solution package completed		5		34
	D5.7	CBA		5	EUROCONTROL	36
	D5.8	Contextual Note		5	SKYNAV	36
	MS5.2	Contextual Note delivered		5		36
WP6	D6.1	Final OSED		6	EUROCONTROL	30
	D6.2	Final VALP		6	DLR	30
	D6.3	Final TS/IRS		6	EUROCONTROL	34
	D6.4	VALR		6	DLR	34
	D6.5	Final STAND		6	EUROCONTROL	34
	D6.6	Final REG		6	ENAC IT	34
	MS6.1	Final solution package completed		6		34
	D6.7	CBA		6	EUROCONTROL	36
	D6.8	Contextual Note		6	EUROCONTROL	36
	MS6.2	Contextual Note delivered		6		36

Figure 2: SPARTA GANTT chart

3.2 Capacity of participants and consortium as a whole #@CON-SOR-CS@# #@PRJ-MGT-PM@#

The SPARTA consortium has been assembled to provide the operational, technical, and research capacity required to deliver two SESAR Solutions for the integration of Space Transport Operations (STO) into the European ATM system. The partnership combines the Network Manager, multiple ANSPs, major research centres, academic institutions, industry, SMEs, and user associations. This balance ensures that each stage of the lifecycle, from requirements capture to validation and standardisation, is supported by organisations with the relevant competences and infrastructure.

EUROCONTROL provides the central link to the Network Manager (NM) environment, guaranteeing that outputs are aligned with SESAR architecture and operational practice. Access to NM operational platforms and shadow/test environments allows the project to validate specifications in representative conditions without impacting live systems. Alongside EUROCONTROL, national ANSPs including DFS, LFV, ENAV, ENAIRE, and NATS contribute with operational expertise, facilities, and procedures. Their participation ensures that concepts are validated against real-world air traffic management practices across multiple FIRs.

DLR is a key technical contributor. Building on its existing Real-time Mission Monitoring (RMM) tool, developed in ECHO/ECHO2, DLR leads the evolution of this capability into the Network Real-time Mission Monitoring NRMM) tool for use at the NM Space Desk. This provides the foundation for assessing and visualising the impact of launches, re-entries, and hazard areas on the network in real time. DLR also contributes simulation capacity, safety assessment expertise, and validation methodology, ensuring that requirements and specifications are technically rigorous and directly linked to the maturity assessment process.

Other research organisations strengthen this technical base. CIRA contributes facilities for trajectory modelling and safety analysis. ENAC and LIU provide expertise in system design, modelling, and human performance, ensuring that validation covers both technical and operational acceptability dimensions. Together, these organisations ensure that SESAR artefacts such as OSED, TS/IRS, and SPR-INTEROP are supported by robust analysis and systematic validation.

Industrial and commercial actors contribute directly to exploitation and operational realism. Thales LAS ensures that system specifications are consistent with industrial development pathways and can be integrated into future ATM/CNS product lines. SaxaVord/Europe Space Centre GmbH provides access to launch site infrastructure and operator interfaces, making it possible to validate concepts against live mission scenarios. Sceye Spain contributes HAPS operations, enabling the project to test how higher airspace activities interact with STO corridors and hazard volumes. SkyNav Europe, as a specialised consultancy, provides expertise in ATM and new entrants, with a focus on regulatory alignment and higher airspace integration. It contributes directly to the drafting of key documents such as OSED, SPR-INTEROP, STAND, and REG, and supports regulatory and exploitation pathways.

Academic institutions ENAC and LIU also provide critical input in transversal areas such as human performance and training. Their role is to ensure that procedures and tools developed under SPARTA are operationally acceptable to controllers and operators, and that validation reflects the human-in-the-loop aspects required by SESAR. IFATCA brings the operational community perspective, ensuring that controller requirements and constraints are captured in specifications and assessed during validation. OpenUTM contributes technical expertise from the unmanned traffic management (UTM) domain, which is directly relevant to the data-exchange frameworks embedded in both solutions.

Critical infrastructure is accessible across the consortium. EUROCONTROL provides NM systems and shadow environments; DFS, LFV, ENAV, ENAIRE, and NATS provide ATC/ATFM systems and operational procedures; DLR, CIRA, ENAC, and LIU provide laboratories, simulators, and modelling platforms; SaxaVord contributes launch site facilities; and Sceye provides HAPS platforms. Together, this ensures that validation scenarios can be executed in environments that are representative of operational conditions, while maintaining safety and system integrity.

The consortium is complementary by design. EUROCONTROL and ANSPs anchor the work in operational practice. DLR and other research centres provide the technical basis for modelling, simulation, and safety assessment. Industry and commercial operators ensure pathways to deployment. SMEs such as SkyNav Europe and

OpenUTM provide targeted expertise in higher airspace, regulatory frameworks, and digital architectures. Associations and academic partners ensure that human factors and stakeholder needs are properly addressed.

Industrial and commercial exploitation is supported through the involvement of both large system integrators and smaller specialist consultancies, together with commercial operators providing launch and high-altitude services. This balance ensures that results can move beyond research into practical deployment pathways, covering both technology and regulatory integration. The consortium also includes organisations with a global reach, ensuring that outcomes are not limited to the European context but are aligned with international operational practice and interoperability requirements. This guarantees that the solutions developed under SPARTA are both deployable within Europe and acceptable in the wider global ATM and space operations environment.

Taken together, the consortium provides the technical, operational, and research capacity to deliver two validated SESAR Solutions at TRL 6, supported by rigorous validation, access to infrastructure, and alignment with SESAR processes.

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Tables for section 3.1

Table 3.1a: List of work packages

Work package No	Work Package Title	Lead Participant No	Lead Participant Short Name	Person-Months	Start Month	End month
WP1	Project Management & Coordination	1	EUROCONTROL	43.60	1	36
WP2	Dissemination, Exploitation, Communication, and Data Management	10	SKYNAV	48.34	1	36
WP3	Solution 1 – Flexible and Scalable Mission Planning	10	SKYNAV	114.10	1	18
WP4	Solution 2 – Dynamic Real-Time Operations	3	DLR	172.53	1	18
WP5	Solution 1 – Flexible and Scalable Mission Planning	10	SKYNAV	123.95	19	36
WP6	Solution 2 – Dynamic Real-Time Operations	3	DLR	174.02	19	36

Table 3.1b: Work package description

For each work package:

Work package number	WP1
Work package title	Project Management & Coordination

Objectives

WP1 provides the governance, coordination, and quality assurance framework that ensures SPARTA is delivered on time, to scope, and to the maturity levels required for SESAR 3 JU Industrial Research projects. Its objectives are to:

a) Establish and operate a governance structure in line with SESAR 3 JU requirements, ensuring clear decision-making, effective internal communication, and timely conflict resolution.

b) Manage all contractual, administrative, and financial aspects of the Grant Agreement, including all formal reporting to SESAR 3 JU.

c) Monitor progress against the approved Project Management Plan (PMP), work plan, and solution maturity targets, ensuring that corrective action is taken where required.

d) Deliver all mandatory SESAR milestones, reviews, and maturity exit criteria on schedule.

e) Maintain a structured quality assurance process to ensure all outputs meet SESAR evaluation, maturity assessment, and quality standards.

Description of work

WP1 runs for the full project and covers governance, reporting, quality assurance, risk management, and contractual/financial administration. EUROCONTROL, as Coordinator, leads WP1, with support from all partners.

Governance and coordination

The governance structure is based on three levels. The *Project Management Board* (PMB), chaired by the Coordinator, meets quarterly to review overall progress, resource consumption, and risks, and approves all major deliverables before submission. The *Work Package Lead* (WPL) meetings, held monthly and chaired by the Coordinator, monitor day-to-day technical progress, manage interdependencies, and resolve emerging issues. An *Advisory Board* (AB) of external stakeholders, including regulators and defence/space organisations, meets twice (midway and at project end) to provide strategic feedback and ensure external alignment. Governance activities represent around 20 person-months of effort, largely from the Coordinator but with partner contributions for reporting and representation.

Project Management Plan (PMP)

The PMP is prepared and submitted at M3 and updated at M20. It defines the final solution scope, maturity baselines, and performance expectations, and includes annexed Quality and Risk Management Plans, communication protocols, document control, and reporting templates. Drafting and internal review of the PMP requires contributions from all partners (approx. 10 person-months total) coordinated by EUROCONTROL.

Data Management Plan (DMP)

The first DMP is delivered at M6, updated at M22, and finalised at M32. WP1 ensures that technical partners provide information on datasets, metadata, and repositories, and that academic partners contribute FAIR alignment. EUROCONTROL consolidates inputs into the formal DMP. This activity represents around 6–8 person-months over the project.

Reporting and reviews

WP1 ensures timely preparation of mandatory SESAR and Horizon Europe reviews. This includes:

- Technical Project Review (M9–10): Internal dry-run organised by the Coordinator to check completeness of technical evidence.
- End of Reporting Period 1 (M18): Consolidation of technical/financial reports and updated maturity self-assessments.
- Horizon Europe Review (M20–21): Internal readiness check to confirm evidence traceability.
- Exit maturity gate (M34): Coordination of final solution packages and self-assessment evidence.
- Grant Agreement closure (M36): Preparation of the Final Project Report and archiving of documentation.

Reporting is a significant workload: approx. 25 person-months across the project, with EUROCONTROL leading and WP leaders supplying content.

Risk management

A risk register is created at project start and updated monthly through WPL meetings. Each risk is assessed for probability and impact, with mitigation actions assigned. Escalation procedures bring high-priority risks directly to the PMB. All partners contribute to identifying and tracking risks, with EUROCONTROL consolidating and reporting them. Around 8 person-months are allocated for risk monitoring and reporting.

Quality assurance

All deliverables undergo a two-stage review: an independent technical review by a partner not responsible for drafting, and a compliance review by the Coordinator to ensure alignment with SESAR templates, Horizon rules, and PMP criteria. Reviews are scheduled at least two weeks before submission to allow corrections. The quality review process consumes around 15 person-months across the consortium.

Financial and administrative management

WP1 ensures compliance with the lump-sum model by tracking person-months and deliverable completion status per WP. EUROCONTROL monitors resource allocation, ensures equitable distribution of effort, and prepares consolidated financial statements. Partners provide quarterly financial and effort reports to the Coordinator. Closure at M36 includes submission of final technical and financial reports. This requires around 20 person-months at the Coordinator, with small contributions from each partner.

Role of participants

- EUROCONTROL (Lead): Coordinates WP1, chairs PMB, prepares PMP, consolidates DMP and reports, manages contractual/financial tasks, and ensures quality and compliance.
- All partners: Participate in PMB and WPL meetings, contribute inputs for PMP/DMP/reports, and act as independent reviewers for deliverables.
- Advisory Board: Provides external input and ensures alignment with wider European and international policy context.

Work package number	WP2
Work package title	Dissemination, Exploitation, Communication, and Data Management

Objectives

WP2 ensures that SPARTA results are visible to stakeholders, disseminated through targeted technical engagement, and exploited to prepare pathways for operational and regulatory uptake. The objectives are to:

a) Produce, update, and implement a Communication and Dissemination Plan (CDE Plan) that defines objectives, audiences, channels, and performance indicators.
b) Establish and maintain the project website and online presence as a central access point for project information and outputs.
c) Organise and deliver mid-project and final stakeholder workshops as major dissemination events, with published reports capturing feedback and conclusions.
d) Define and refine exploitation pathways, including standardisation and regulatory contributions.
e) Ensure compliance with SESAR 3 JU obligations for proactive sharing of results with other projects under the same call.

Description of work

WP2 runs for the full duration of SPARTA and is led by SkyNav, supported by EUROCONTROL and other partners for outreach, content development, and event organisation. It ensures that project outputs are communicated effectively, disseminated to operational and regulatory stakeholders, and positioned for exploitation in future deployment pathways.

The work begins with the Communication & Dissemination Plan (D2.1), delivered at Month 3. This document sets the overall communication strategy, defines target audiences, key messages, and metrics, and includes an editorial calendar, event plan, and alignment with SESAR JU branding guidelines. SkyNav drafts the plan with inputs from all partners on national and domain-specific opportunities. Preparation requires approximately 2 person-months distributed across the consortium.

In parallel, the project website and online presence (D2.2) are established by Month 3. The site serves as the public repository for non-confidential deliverables, news updates, and event announcements, and links directly to the SESAR JU portal. SkyNav manages technical setup and hosting, while partners contribute content on a rolling basis. Initial setup and design account for around 1 person-month, with additional fractional effort allocated for maintenance and content updates across the project.

The Updated CDE Plan (D2.3) is prepared at Month 20. This update reflects project progress, lessons learned from the mid-project phase, and feedback from stakeholders, ensuring that dissemination remains targeted and aligned with evolving SESAR priorities. The update is concise but requires coordination and review, representing around 1 person-month of effort.

A central activity is the Mid-project Stakeholder Workshop (D2.4), organised at Month 18. This event is co-hosted by EUROCONTROL and SkyNav. The workshop presents draft specifications (OSED, TS/IRS) and validation plans to regulators, ANSPs, mission operators, and industry. Structured feedback is gathered on operational concepts and integration approaches, which is then fed into WP3 and WP4 activities for refinement. The Workshop Report documents participants, discussions, and how feedback influences the subsequent development phase. Organising and documenting this event is resource-intensive, requiring approximately 5–6 person-months across the consortium, covering preparation, facilitation, and reporting.

The final stage of WP2 is the End-project Stakeholder Workshop (D2.5) at Month 36. This dissemination event showcases the validated solutions, cost–benefit results, and exploitation pathways, targeting the same broad community of stakeholders. It acts as the primary opportunity for external uptake and alignment with regulatory and standardisation bodies. As with the mid-project event, the workshop is expected to involve 50–100 participants, combining plenary sessions with technical breakouts. The Workshop Report captures outcomes and defines recommendations for adoption. This activity requires approximately 5–6 person-months of effort for preparation, delivery, and documentation.

Alongside these milestones, WP2 also supports continuous dissemination through partner participation in SESAR events, ICAO EUR/NAT meetings, EUROCAE working groups, and technical and academic conferences. Industrial partners contribute to professional forums, while academic and research partners prepare scientific publications. SkyNav coordinates ongoing outreach through the website, infographics, social media, and newsletters. These continuous activities represent around 8 person-months of effort across the consortium, ensuring SPARTA maintains a strong and consistent external presence.

Overall, WP2 accounts for approximately 20–22 person-months, distributed across SkyNav, EUROCONTROL, and contributing partners. This level of effort is proportionate for an Industrial Research project and reflects the importance of ensuring early visibility, mid-project feedback, and structured preparation for exploitation.

Role of participants

- SkyNav (Lead): Drafts and updates the CDE Plan, manages the website and branding, leads exploitation strategy, and coordinates SESAR JU dissemination obligations.
- EUROCONTROL: Co-leads the stakeholder workshops, ensures alignment with SESAR JU communication frameworks, and supports exploitation activities through NM channels.
- All partners: Provide content for the website and communication channels, contribute to dissemination through conferences and publications, actively participate in workshops, and contribute to exploitation pathways.

Work package number	WP3
Work package title	Solution 1 – Flexible and Scalable Mission Planning (Months 1–18)

Objectives

WP3 covers the first reporting period for Solution 1, establishing the operational, technical, and validation groundwork for progression to TRL 6 in the second reporting period. The objectives are to:

a) Establish a fixed operational baseline and requirements set to underpin all subsequent documentation, architecture work, and validation.
b) Produce initial versions of some TRL 6 deliverables — OSED, SPR-INTEROP/OSED, TS/IRS, VALP, CBA, STAND, REG — together with supporting documentation such as the FRD.
c) Complete the architecture and interface definitions to a level suitable for validation against agreed operational scenarios and interoperability requirements.
d) Plan and prepare all validation activities, ensuring facilities, datasets, and environments are available, and securing test NMOC platform access (no live system integration in this phase).
e) Deliver intermediate versions of all major deliverables to SESAR 3 JU at the Horizon Europe review for feedback, to be incorporated in the second reporting period.

Description of work

WP3 runs from Month 1 to Month 18 and is led by SkyNav, supported by EUROCONTROL, ENAC, and other partners with expertise in operations, requirements engineering, and validation. The purpose of this work package is to establish the operational and technical baseline for the planning solution and deliver the first set of specifications and validation plans required to progress towards TRL 6.

The first activity is the definition of the operational baseline, captured in the OSED (D3.1, M12). This document describes the roles and responsibilities of mission operators, NM, ANSPs, State regulators, and military stakeholders; the expected timing of planning actions; and the information exchanges needed during the planning phase. The OSED forms the foundation for all downstream deliverables and ensures consistency across safety, performance, and interoperability requirements. To support traceability, an FRD is also prepared internally during early drafting. While not a formal deliverable, it is essential for ensuring that the TS/IRS remains coherent and fully aligned with the operational baseline.

The Initial TS/IRS (D3.2, M18) builds on this foundation by defining the functional behaviour and logical interfaces required for the planning capability. It specifies what services must be provided, the data to be exchanged, and how interfaces with NM systems, ANSP planning tools, and operator platforms should be logically structured. As per SESAR guidance, the TS/IRS describes the “what” rather than the “how”, leaving implementation detail open. An Intermediate OSED (D3.3, M18) is produced in parallel to capture updates from requirements workshops and validation planning, ensuring that operational assumptions remain consistent with technical specifications.

The Initial VALP (D3.4, M18) is prepared during this period, setting out the validation strategy for the solution. It defines the objectives, scenarios, KPIs, data sources, and facilities to be used in the next phase. Particular emphasis is placed on the use of shadow/test NMOC platforms, rather than live operational systems, to mitigate procedural, security, and stability risks while still enabling representative verification of interfaces and data exchanges. Execution of validation will be conducted mainly in WP6, but the VALP provides the structure and methodology to ensure that the solution can reach TRL 6.

Preparation also begins for the economic and regulatory dimensions. The CBA is initiated during this reporting period, with initial data inputs and modelling assumptions identified. This ensures that the later full CBA will be based on validation data rather than starting from scratch. In parallel, the Initial STAND (D3.5,

M18) and Initial REG (D3.6, M18) deliverables are drafted. STAND highlights candidate contributions to standardisation bodies such as EUROCAE and ICAO, with an early focus on data models and planning processes. REG captures the regulatory implications of the solution and proposes preliminary pathways for alignment with EASA and national authorities.

Integration into the SESAR architecture also begins in this phase. Model-based representations are developed from TRL 4 onwards, ensuring consistency between the OSED, TS/IRS, and programme-level architecture. A dedicated content-integration architect is appointed to coordinate with the SESAR 3 JU Point of Contact and ensure alignment with Master Plan processes.

Work in WP3 follows an iterative approach. Drafts and intermediate versions of the OSED, TS/IRS, and VALP are produced in advance of the Technical Project Review (M9–10) and the Horizon Europe mid-term review (M18–20). This enables SESAR 3 JU and partners to provide feedback and ensures deliverables are refined before they are finalised in WP5.

Risks in WP3 include delays in defining interfaces with external systems, restrictions on access to operational data for validation, and potential misalignment with architecture modelling expectations. Mitigations include early interface workshops with NM and ANSP technical teams, use of simulated or anonymised datasets where direct access is not possible, and assignment of a dedicated content-integration role to maintain architectural compliance. Quality assurance is provided through the project's two-stage review process: independent technical review by a non-authoring partner, followed by compliance review by the Coordinator.

By Month 18, WP3 will have produced a complete first iteration of all major deliverables for the planning solution. These outputs provide the baseline for refinement, validation execution, and finalisation in WP5. The workload is estimated at approximately 22–25 person-months, covering requirements capture, specification drafting, validation planning, and preparatory work for standardisation and regulation.

Milestones (Period 1)

- M3.1 (Month 6): Operational baseline and initial OSED endorsed by partners; FRD draft available for architecture work.
- M3.2 (Month 12): Draft SPR-INTEROP/OSED and TS/IRS completed; VALP structure and scenarios agreed; initial CBA inputs identified.
- M3.3 (Month 18): Intermediate versions of all TRL 6 deliverables submitted for Horizon Europe review, with documented SESAR 3 JU and partner feedback ready for WP5 integration.

Role of participants

- SkyNav (Lead): Drafts OSED, TS/IRS, and VALP; coordinates validation planning; contributes to STAND; organises stakeholder workshops.
- EUROCONTROL: Provides NM expertise; ensures consistency with SESAR architecture; supports TS/IRS drafting; contributes to validation scenarios.
- ENAC (Italy): Leads REG drafting; ensures regulatory pathways are realistic and aligned with EASA/national authorities.
- All partners: Contribute operational scenarios, provide input to specifications, review drafts, and support validation design.

Work package number	WP4
Work package title	Solution 2 – Dynamic Real-Time Operations (M1–18)

Objectives

WP4 initiates the development and early validation of a real-time coordination capability for managing high-altitude and space transport operations during execution, enabling dynamic adaptation to changing operational conditions while maintaining safe and efficient use of European airspace. The objectives for M1–18 are to:

a) Establish the operational and technical baseline for real-time mission coordination, defining roles, responsibilities, timing of actions, and required information exchanges between mission operators, ANSPs, NM, and State regulators, and military when applicable.

b) Produce initial versions of the OSED, SPR-INTEROP/OSED, TS/IRS, VALP, and supporting documents, with traceability between operational scenarios, requirements, and validation planning.

c) Develop early prototype functions for dynamic coordination in a representative non-operational test environment, ensuring logical interfaces are in place with NM, ANSP, and operator systems.

d) Conduct initial validation activities to verify baseline workflows and basic functional behaviour, identifying any issues that will need refinement in WP7.

e) Reduce risk for the final development and TRL 6 validation phase by resolving early specification gaps, integration issues, and data exchange dependencies.

Description of work

WP4 runs from Month 1 to Month 18 and is led by DLR, supported by EUROCONTROL, SkyNav, ENAC, and other technical partners. It initiates the development of a real-time coordination capability for managing space transport and higher-airspace operations during execution. The focus is on establishing the operational and technical baseline, producing first versions of the key specifications, and running early validation activities in test environments to reduce risk ahead of the full TRL 6 validation in WP6.

The first step is the definition of the operational concept, which describes how real-time mission coordination is carried out during active phases. The OSED (D4.1, M12) records stakeholder roles — including mission operators, ANSPs, NM, State regulators, and military authorities — the timing of actions, and the information exchanges needed for dynamic coordination. This provides the operational reference for safety, performance, and interoperability requirements.

To maintain requirements traceability, WP4 also prepares a Functional Requirements Document (FRD) during the drafting phase. Although not a formal deliverable under SESAR's TRL 6 framework, the FRD is essential for coherent development of the TS/IRS. It ensures that requirements are captured consistently and reduces the risk of gaps in later integration and validation.

The SPR-INTEROP/OSED (D4.3, M18) consolidates safety, performance, and interoperability requirements, supported by transversal safety and human performance assessments. Requirements are structured so they can be traced directly into validation reporting and the later CBA. In parallel, the TS/IRS (D4.2, M18) defines the functional behaviour and logical interfaces of the real-time coordination capability. It specifies how updates, hazard adjustments, and contingencies are communicated between operator platforms, NM systems, and ANSP tactical systems, using agreed data models and SWIM services.

Validation planning is captured in the Initial VALP (D4.4, M18). It defines objectives, scenarios, KPIs, data sources, facilities, and validation environments. In this first reporting period, the focus is on preparation and limited test cases in a shadow/test NMOC platform, not the live operational system. This avoids the procedural, security, and stability issues of live integration, while allowing representative interface

verification. Early validation activities will include end-to-end message exchange for basic updates, coordination of tactical hazard area adjustments against simulated traffic, and handling of late changes or degraded data inputs. Results are consolidated in an interim validation note (as part of the VALP/VALR cycle) to support updates in WP6.

Economic analysis begins in this phase with identification of the main cost and benefit drivers. Early modelling ensures that data collected during validation can be used directly for the CBA in WP6. Standardisation and regulatory work also starts here, with the Initial STAND (D4.5, M18) identifying candidate contributions to service definitions or data exchange protocols, and the Initial REG (D4.6, M18) capturing early regulatory implications for EASA and national authorities.

Integration into the SESAR architecture begins in this period. At least one model will be developed to support the draft OSED and TS/IRS, and a content-integration architect is assigned to ensure alignment with the SESAR 3 JU integration process. Draft deliverables (OSED, TS/IRS, SPR-INTEROP/OSED, VALP) will be available for the Technical Project Review and Horizon Europe review, ensuring that feedback from SESAR 3 JU and partners can be incorporated before the finalisation stage in WP6.

Risks in WP4 include delays in defining interfaces with operational systems, limited fidelity of the test environment for some scenarios, and restricted access to representative data. These are mitigated by holding early interface definition workshops with NM and ANSP technical teams, using simulated or anonymised datasets when live data is unavailable, and applying progressive integration testing to identify issues early. All outputs undergo the project's two-stage internal review: technical peer review by a non-authoring partner, followed by compliance review by the Coordinator.

By the end of Month 18, WP4 will have produced initial specifications, validation plans, and early test results, providing the baseline for full development and validation in WP6. The workload is estimated at approximately 22–24 person-months, distributed across DLR, EUROCONTROL, SkyNav, ENAC, and supporting partners.

Milestones (Period 1)

- M4.1 (Month 6): Draft operational concept for real-time coordination endorsed; FRD available for early TS/IRS drafting.
- M4.2 (Month 12): Initial OSED completed; draft SPR-INTEROP/OSED and TS/IRS in circulation; VALP structure defined.
- M4.3 (Month 18): Draft specifications and initial validation results consolidated for Horizon Europe review, with SESAR 3 JU and partner feedback documented for WP6 integration.

Role of participants

- DLR (Lead): Leads WP4, prepares FRD, develops TS/IRS, and coordinates VALP. Designs prototype functions and ensures coherence across the solution.
- EUROCONTROL: Provides NM expertise, drafts OSED and supports TS/IRS drafting, leads architecture integration, and contributes to early economic analysis.
- SkyNav: Supports OSED drafting, coordinates validation planning, drafts STAND, and contributes to REG.
- ENAC (Italy): Leads REG drafting, ensuring regulatory perspectives are included in OSED and validation design.
- All partners: Provide input to OSED and TS/IRS, support validation planning, participate in interface workshops, and contribute to initial validation exercises.

Work package number	WP5
Work package title	Solution 1 – Flexible and Scalable Mission Planning (Months 19–36)

Objectives

WP5 refines the planning solution defined in WP3 and brings it to TRL 6. Its objectives are to:

a) Finalise the OSED, TS/IRS, and SPR-INTEROP/OSED to reflect lessons from validation and stakeholder feedback.

b) Execute the validation scenarios defined in the VALP and consolidate results in the VALR.

c) Produce a comprehensive cost–benefit analysis based on validation evidence and stakeholder input.

d) Identify and prepare candidate contributions for standardisation bodies, and propose regulatory material suitable for EASA and national authorities.

e) Deliver the complete TRL 6 documentation set, including the Contextual Note, demonstrating readiness for transition to deployment.

Description of work

WP5 runs from Month 19 to Month 36 and is led by SkyNav, supported by EUROCONTROL, ENAC, and other technical partners. It refines the specifications and validation activities established in WP3 and brings the planning solution to TRL 6 maturity. The focus is on extended validation, cost–benefit analysis, and preparation of final regulatory and standardisation outputs.

Work in this period begins with refinement of the OSED (D5.1, M30), ensuring it reflects lessons from early validation activities and incorporates stakeholder feedback from the mid-project workshop and Technical Project Review. Updates address refinements in operational roles, planning workflows, and information exchanges. The OSED also serves as the operational reference for the final safety and performance assessments.

Validation activities continue with the execution of the scenarios defined in the VALP. By Month 30, the Final VALP (D5.2) is produced, documenting adjustments to objectives, scenarios, and KPIs. Execution of validation then proceeds across shadow/test NMOC platforms, fast-time simulations, and human-in-the-loop exercises. Outputs are consolidated in the VALR (D5.4, M34), which presents evidence against performance requirements, transversal safety and human performance assessments, and conclusions on the solution's maturity.

Technical specifications are finalised in the TS/IRS (D5.3, M34). This document incorporates results from validation, ensures consistency with the OSED, and confirms functional behaviours and logical interfaces for deployment. Traceability to requirements and validation evidence is maintained throughout.

Economic viability is demonstrated in the CBA (D5.7, M36), which quantifies the benefits of the planning solution against costs of adaptation and deployment. The analysis draws on validation results, performance data, and inputs from operators and ANSPs. EUROCONTROL leads the CBA, supported by partners contributing operational and cost data.

Standardisation and regulatory outputs are delivered in the second half of this work package. The Final STAND (D5.5, M34) identifies concrete candidate contributions for EUROCAE and ICAO processes, such as data model extensions or collaborative decision-making procedures for STO and HAO planning. The Final REG (D5.6, M34) proposes acceptable means of compliance or guidance material for EASA and national authorities, addressing both planning processes and integration into existing airspace management frameworks.

The Contextual Note (D5.8, M36) completes the TRL 6 package, providing a concise introduction to the solution, expected performance benefits, and recommendations for subsequent industrialisation or deployment. Together with the final OSED, TS/IRS, VALR, CBA, STAND, and REG, it demonstrates readiness for transition from research to deployment planning.

Integration into the SESAR architecture continues throughout this period. At least one final architecture model is delivered to ensure that specifications and validation results are reflected in the programme-level architecture and checked for alignment with the Master Plan. Iterative internal reviews are held ahead of each major submission to ensure deliverables are technically complete and compliant with SESAR quality assessment criteria.

Risks in WP5 include delays in completing validation exercises, inconsistency between operational and technical deliverables, and challenges in quantifying costs and benefits. Mitigation measures include maintaining buffer time in the validation schedule, assigning cross-review responsibilities between partners, and early engagement with stakeholders to secure operational and cost data.

By the end of Month 36, WP5 will have delivered the full set of TRL 6 planning solution outputs. These provide the complete evidence base required for SESAR 3 JU maturity assessment and ensure that the solution is positioned for adoption in regulatory and industrial contexts. WP5 is estimated at 25–28 person-months across the consortium, reflecting the intensive nature of validation and finalisation activities.

Milestones (Period 2)

- M5.1 (Month 24): Validation activities launched; draft updates to OSED and TS/IRS circulated.
- M5.2 (Month 30): Final OSED and VALP completed; validation scenarios executed.
- M5.3 (Month 34): Final TS/IRS, VALR, STAND, and REG submitted for review.
- M5.4 (Month 36): Contextual Note and CBA finalised; TRL 6 deliverable package submitted.

Role of participants

- SkyNav (Lead): Updates and finalises OSED and TS/IRS, leads validation execution, coordinates production of the Contextual Note, and contributes to STAND.
- EUROCONTROL: Leads the CBA, ensures validation aligns with network performance assessments, and supports architecture integration.
- ENAC (Italy): Leads REG drafting, ensuring final outputs are aligned with EASA and national regulatory frameworks.
- All partners: Provide input to validation, contribute operational and cost data, review draft deliverables, and support finalisation of specifications and assessments.

Work package number	WP6
Work package title	Solution 2 – Dynamic Real-Time Operations (M19–36)

Objectives

WP6 advances the real-time coordination solution from the specifications and preparation in WP4 to final TRL 6 maturity. Its objectives are to:

a) Refine and finalise the OSED, TS/IRS, and SPR-INTEROP/OSED for dynamic real-time coordination, incorporating feedback from validation and stakeholders.

b) Execute full-scale validation campaigns using representative scenarios, including launches, re-entries, contingencies, and cross-border coordination.

c) Consolidate results in the VALR, providing robust evidence of safety, performance, interoperability, and human performance.

d) Conduct a cost–benefit analysis to demonstrate operational and economic viability of the solution.

e) Produce final STAND and REG deliverables to support standardisation and regulatory adoption.

f) Deliver the complete TRL 6 package, including the Contextual Note, positioning the solution for uptake by regulators, ANSPs, and industry.

Description of work

WP6 runs from Month 19 to Month 36 and is led by DLR, supported by EUROCONTROL, ENAC, SkyNav, and other partners. The work refines the operational and technical definitions established in WP4 and executes the validation campaign needed to demonstrate maturity of the real-time coordination capability.

The Final OSED (D6.1, M30) consolidates the operational concept for dynamic coordination, incorporating refinements to message flows, decision-making protocols, and coordination timelines. Updates reflect both stakeholder feedback and early validation results. The Final TS/IRS (D6.3, M34) specifies functional behaviour and logical interfaces, detailing message types, service interactions, and timing requirements, ensuring alignment with SWIM and SESAR architecture. The SPR-INTEROP/OSED consolidates safety, performance, and interoperability requirements, with transversal safety and human performance assessments appended.

The Final VALP (D6.2, M30) updates the validation design to cover the full campaign. Validation activities are executed in shadow/test NMOC platforms and ANSP simulation environments, providing operationally realistic but non-live conditions. These may include:

- Nominal launch scenarios: launches from European (e.g. Andoya, Esrange, SaxaVord, CSG Kourou) and non-European sites (e.g. Cape Canaveral) to test end-to-end workflows and coordination across NM, ANSPs, and operators.
- Off-nominal launches: in-flight anomalies requiring rapid hazard area generation and dissemination to affected ANSPs under compressed timelines.
- Uncontrolled re-entry scenarios: late-notice debris corridor definition requiring expedited hazard area publication and cross-border coordination.
- Dynamic airspace release: validation that reserved volumes can be promptly released and updated in NM/ANSP systems when no longer required.
- Hazard area adaptation: adjustments to active hazard areas due to new trajectory predictions, weather, or traffic demand.
- Tactical decision support: evaluation of decision aids and situational awareness tools for time-critical responses, including human performance assessments.
- Multiple HAPS within a 4DOZ: demonstration of HAPS self-coordination within a defined zone, plus interaction with other operations (supersonic flights, STO launches) requiring coordinated NM responses.

Execution of these scenarios produces the VALR (D6.4, M34), which consolidates results and provides the evidence base for SESAR maturity assessment.

The CBA (D6.7, M36) assesses operational and economic viability, drawing on validation results and stakeholder data to quantify benefits such as reduced disruption, efficiency gains, and implementation costs. EUROCONTROL leads this task, supported by ANSPs and operators.

Exploitation outputs include the Final STAND (D6.5, M34), which identifies candidate standardisation contributions for EUROCAE and ICAO, and the Final REG (D6.6, M34), which proposes acceptable means of compliance or guidance material for EASA and national authorities.

The Contextual Note (D6.8, M36) finalises the TRL 6 documentation set, summarising the solution scope, performance, and deployment recommendations.

Integration into the SESAR architecture continues through WP6, with a fully developed model aligned with the final specifications. Quality assurance follows the project's two-stage review (independent peer review, then compliance review by the Coordinator).

Risks include difficulty in sourcing representative trajectory data for off-nominal events, limitations of testbed fidelity, and interoperability issues between distributed platforms. Mitigations include pre-agreed datasets, early joint rehearsals, and progressive integration testing.

Milestones (Period 2)

- M6.1 (Month 24): Validation campaign launched; updated OSED/TS/IRS drafts circulated.
- M6.2 (Month 30): Final OSED and VALP delivered; validation scenarios underway.
- M6.3 (Month 34): Final TS/IRS, VALR, STAND, and REG completed.
- M6.4 (Month 36): CBA and Contextual Note finalised; TRL 6 package submitted.

Role of participants

- DLR (Lead): Leads WP6; responsible for TS/IRS refinement, VALP/VALR drafting, scenario design, and execution of validation campaigns.
- EUROCONTROL: Leads the CBA and CN, responsible for OSED update and ensures NM integration and alignment with SESAR architecture, contributes to validation execution.
- ENAC (Italy): Leads REG deliverables, ensures regulatory pathways are consistent with EASA and national frameworks.
- SkyNav: Supports OSED and TS/IRS drafting, leads STAND drafting, coordinates stakeholder engagement, contributes to validation design.
- ENAV and other ANSP's will provide operational staff for the execution of validation campaigns.
- All partners: Provide input to scenarios, contribute data, support validation, and review deliverables.

Link to work package	ID Solution	Solution Title	Solution Definition	Solution Lead Beneficiary	Initial Maturity Level	Forecast Target Maturity Level	Qualitative Performance Expectation (as per project Handbook)
WP3 WP5	1	Flexible and Scalable Mission Planning	A pre-tactical NM service with a multi-State CDM process for STO/HAO. It ingests mission submissions via a common digital interface, allows impact assessments, holds defined CDM checkpoints to agree time-bounded 4D hazard proposals and danger areas, and publishes machine-readable products to ANSP and other stakeholders.	SkyNav Europe	2	6	Earlier visibility of missions across the network, fewer late network updates through a structured collaborative decision-making process, smaller and shorter airspace restrictions, more predictable demand and capacity balancing, less manual coordination, and a clear record of decisions for the Network Manager and air navigation service providers.
WP4 WP6	2	Dynamic Real-Time Operations	A real-time NM service that fuses operator status, surveillance and environmental inputs to maintain an authoritative network view of active missions. It updates 4D hazards and related FCAs in near real time, supports early release where safe, and provides decision support for targeted reroutes and flow measures, with machine-readable publication to NOP participants.	DLR	2	6	Faster reaction to mission changes, fewer unnecessary capacity reductions, reduced minutes of airspace blocked and ATFM delay on affected flows, and a consistent authoritative network picture across NM and ANSPs.

Table 3.1c: List of Deliverables

Number	Deliverable name	Short description	Work package number	Short name of lead participant	Type	Dissemination level	Delivery date (in months)
D1.1	Kick-off Meeting Report	Attendees, agenda, decisions, actions, initial risks.	1	EUROCONTROL	R	PU	1
D1.2	Project Management Plan (PMP)	Governance, roles, controls, reporting, QA, change and risk.	1	EUROCONTROL	R	PU	3
D1.3	Data Management Plan (DMP)	FAIR data handling, storage, access, licensing, retention	1	EUROCONTROL	DMP	PU	6
D1.4	Updated Project Management Plan (PMP)	PMP refresh reflecting scope, schedule or risk changes.	1	EUROCONTROL	R	PU	20
D1.5	Updated Data Management Plan	DMP refresh with datasets, repositories and access updates.	1	EUROCONTROL	DMP	PU	22
D1.6	Final Data Management Plan	Consolidated data management outcomes and final access details.	1	EUROCONTROL	R	PU	32
D1.7	Final Project Report	Technical, validation, impact and management summary	1	EUROCONTROL	R	PU	36
D2.1	Communication & Dissemination Plan	Audiences, messages, channels, KPIs, editorial calendar.	2	SKYNAV	R	PU	3
D2.2	Project Website and Online presence	Public site with news, outputs and contact.	2	SKYNAV	DEC	PU	3
D2.3	Updated CDE Plan	Mid-term update of comms/dissemination KPIs and actions.	2	SKYNAV	R	PU	20
D2.4	Mid-project Stakeholder Workshop Report	Planning, organisation and delivery of the mid-project workshop; agenda, participants, materials, outcomes and actions.	2	EUROCONTROL	R	PU	18

D2.5	End-project Stakeholder Workshop Report	Planning, organisation and delivery of the end-project workshop; agenda, participants, materials, outcomes, lessons learned and uptake/next steps.	2	EUROCONTROL	R	PU	36
D3.1	Initial OSED	Baseline concept, roles, scenarios, constraints (Solution 1).	3	SKYNAV	R	PU	12
D3.2	Initial TS/IRS	Baseline functional behaviour and interfaces (Solution 1).	3	SKYNAV	R	PU	18
D3.3	Intermediate OSED	Updated OSED with integration and review inputs (Solution 1).	3	SKYNAV	R	PU	18
D3.4	Initial VALP	Validation plan: methods, scenarios, KPIs, evidence map (Solution 1).	3	SKYNAV	R	PU	18
D3.5	Initial STAND	Initial standardisation targets and contribution roadmap.	3	SKYNAV	R	PU	18
D3.6	Initial REG	Initial regulatory analysis and draft inputs.	3	ENAC IT	R	PU	18
D4.1	Initial OSED	Baseline concept, roles, scenarios, constraints (Solution 2).	4	EUROCONTROL	R	PU	12
D4.2	Initial TS/IRS	Baseline functional behaviour and interfaces (Solution 2).	4	DLR	R	PU	18
D4.3	Intermediate OSED	Updated OSED with integration and review inputs (Solution 2).	4	EUROCONTROL	R	PU	18
D4.4	Initial VALP	Validation plan: methods, scenarios, KPIs, evidence map (Solution 2).	4	DLR	R	PU	18
D4.5	Initial STAND	Initial standardisation targets and contribution roadmap.	4	SKYNAV	R	PU	18
D4.6	Initial REG	Initial regulatory analysis and draft inputs.	4	ENAC IT	R	PU	18
D5.1	Final OSED	Consolidated operational concept (Solution 1).	5	SKYNAV	R	PU	30
D5.2	Final VALP	Finalised validation plan and acceptance criteria (Solution 1).	5	SKYNAV	R	PU	30

D5.3	Final TS/IRS	Complete technical and interface specifications (Solution 1).	5	SKYNAV	R	PU	34
D5.4	VALR	Validation results vs KPIs and acceptance criteria (Solution 1).	5	SKYNAV	R	PU	34
D5.5	Final STAND	Packaged standardisation inputs for adoption (Solution 1).	5	SKYNAV	R	PU	34
D5.6	Final REG	Final regulatory recommendations (Solution 1).	5	ENAC IT	R	PU	34
D5.7	CBA	Cost–benefit assessment and deployment business case (Solution 1).	5	EUROCONTROL	R	PU	36
D5.8	Contextual Note	Non-technical summary and policy/standardisation context (Solution 1).	5	SKYNAV	R	PU	36
D6.1	Final OSED	Consolidated operational concept (Solution 2).	6	EUROCONTROL	R	PU	30
D6.2	Final VALP	Finalised validation plan and acceptance criteria (Solution 2).	6	DLR	R	PU	30
D6.3	Final TS/IRS	Complete technical and interface specifications (Solution 2).	6	DLR	R	PU	34
D6.4	VALR	Validation results vs KPIs and acceptance criteria (Solution 2).	6	DLR	R	PU	34
D6.5	Final STAND	Packaged standardisation inputs for adoption (Solution 2).	6	SKYNAV	R	PU	34
D6.6	Final REG	Final regulatory recommendations (Solution 2).	6	ENAC IT	R	PU	34
D6.7	CBA	Cost–benefit assessment and deployment business case (Solution 2).	6	EUROCONTROL	R	PU	36
D6.8	Contextual Note	Non-technical summary and policy/standardisation context (Solution 2).	6	EUROCONTROL	R	PU	36

Table 3.1d: List of milestones

Milestone number	Milestone name	Related work package(s)	Due date (in month)	Means of verification
1.1	Kick-off meeting held	1	1	KOM minutes, attendance list, agenda submitted to SESAR 3 JU
1.2	Project Management Plan approved	1	3	PMP approved by PMB and delivered to SESAR 3 JU
2.1	CDE Plan approved and website operational	2	3	CDE Plan published, project website online and accessible
1.3	End of Period 1 review package completed	1	18	Consolidated technical and administrative reports, updated maturity self-assessments submitted
2.2	Mid-project stakeholder workshop delivered	2	18	Workshop held, participant list and report submitted
3.1	Baseline specification package completed	3	18	Initial OSED, TS/IRS, VALP, SPR-INTEROP, STAND, REG available for review
4.1	Baseline specification package completed	4	18	Initial OSED, TS/IRS, VALP, SPR-INTEROP, STAND, REG available for review
1.4	Horizon Europe Review readiness confirmed	1	21	All evidence validated internally, full package ready for HE review
1.5	Exit maturity gate readiness confirmed	1	34	Final solution packages, maturity self-assessments, supporting documentation available
5.1	Final solution package completed	5	34	Final OSED, TS/IRS, VALP, VALR, SPR-INTEROP, STAND, REG, draft CBA submitted for exit gate
6.1	Final solution package completed	6	34	Final OSED, TS/IRS, VALP, VALR, SPR-INTEROP, STAND, REG, draft CBA submitted for exit gate
1.6	Grant Agreement closure package submitted	1	36	Final report and financial closure documentation submitted

2.3	Final stakeholder workshop delivered	2	36	Workshop held, participant list and report submitted
5.2	Contextual Note delivered	5	36	Final CN and CBA submitted as solution handover
6.2	Contextual Note delivered	6	36	Final CN and CBA submitted as solution handover

Table 3.1e: Critical risks for implementation #@RSK-MGT-RM@#

Description of risk (indicate level of (i) likelihood, and (ii) severity: Low/Medium/High)	Work package(s) involved	Proposed risk-mitigation measures
Operational data/platform access delayed. Access to NM/ANSP/operator test data/environments slips and blocks integration/validation. *(L: Medium; S: High)*	WP3, WP4, WP5, WP6	Early MoUs/LoIs; define synthetic/archived datasets; use shadow/testbeds; add stage-gates tied to access.
Too few representative missions. Not enough suitable missions within the project window to exercise scenarios/KPIs. *(L: Medium; S: High)*	WP3, WP4, WP5, WP6	Pre-agree mission windows; use archived/synthetic data; diversify scenarios to reduce dependence on a single provider.
Cross-border complexity causes scope creep/delay. Multi-State coordination adds FIRs/steps and stretches timelines. *(L: Medium; S: Medium)*	WP3, WP4, WP5, WP6	Fix pilot cross-border scenarios in VALP; strict change control; cap number of FIRs; use common templates.
Validation resources/facilities constrained. Limited access to controllers/sim labs/NM testbeds or range windows. *(L: Medium; S: High)*	WP3, WP4, WP5, WP6	Book early with LoIs; reserve contingency slots; enable remote/recorded sessions; allow synthetic/archived data where live access is unavailable.
Integration & scalability underestimated. Interface effort/peak-load performance exceed plan. *(L: Medium; S: High)*	WP3, WP4, WP5, WP6	Issue ICDs early; run early integration sprints; perform load/stress tests; keep a scale-out plan.
Technical performance shortfalls. One or more components miss quality/performance thresholds in trials. *(L: Medium; S: High)*	WP3, WP4, WP5, WP6	Define KPIs in TS/IRS & VALP; benchmark early on reference datasets; staged acceptance with human-in-the-loop fallback.
Interoperability variability. Some stakeholders cannot ingest machine-readable outputs during trials. *(L: Medium; S: Medium)*	WP3, WP4, WP5, WP6	Publish schemas & examples; provide simple reference adapters; dual outputs (machine-readable + human-readable); early plug-tests.

Budget/schedule pressure → TRL shortfall. Slippage forces scope cuts below TRL-6 targets. *(L: Low; S: High)*	WP3, WP4, WP5, WP6	Prioritise TRL-critical scope; TRL gates/readiness reviews; early de-scope of non-essentials with governance approval.
Open Science vs data protection/security. FAIR openness conflicts with confidentiality/security limits. *(L: Low; S: Medium)*	WP2	Tiered access in DMP; anonymised/synthetic public sets; embargo periods; separate public/restricted artefacts.

#§RSK-MGT-RM§#

Table 3.1f: Summary of staff effort

	WP1	WP2	WP3	WP4	WP5	WP6	Total Person-Months per Participant
1 EUROCONTROL	20,0	10,0	31,0	41,0	31,0	41,0	**174,0**
2 DFS	-	-	1,6	1,3	1,2	1,3	**5,4**
3 DLR	6,0	6,0	9,0	38,0	8,0	39,0	**106,0**
4 SWEDISH CIVIL AVIATION AUTHORITY	-	-	5,7	8,1	5,7	8,1	**27,6**
5 ENAV	1,5	1,5	4,5	5,5	4,5	7,0	**24,5**
6 NATS	2,0	1,0	4,0	4,0	3,0	3,0	**17,0**
7 ENAIRE	1,0	1,8	1,2	1,0	1,0	1,0	**7,0**
8 Europe Space Centre GmbH / SaxaVord	-	-	0,8	0,8	0,6	0,6	**2,8**
9 ENAC IT	2,0	1,0	7,5	9,0	7,0	8,0	**34,5**
10 SkyNav Europe	7,5	18,0	21,0	14,0	32,0	16,0	**108,5**
11 ENAC FR	0,6	4,0	4,5	4,5	4,5	4,5	**22,6**
12 LIU	-	-	4,0	-	4,0	-	**8,0**
13 CIRA	1,0	1,0	-	20,0	-	25,0	**47,0**
14 Sceye Spain	-	-	4,3	4,3	2,5	2,5	**13,6**
15 IFATCA	2,0	2,0	3,0	3,0	3,0	5,0	**18,0**
16 OpenUTM	-	1,0	4,0	-	8,0	-	**13,0**
17 THALES LAS FRANCE SAS	-	-	-	6,0	-	-	**6,0**
18 ANRA TECHNOLOGIES UK LTD	-	1,0	8,0	12,0	8,0	12,0	**41,0**
19 HAPS Alliance							
Total Person Months	**43,6**	**48,3**	**114,1**	**172,5**	**124,0**	**174,0**	**676,5**

Should this tender be successful EUROCONTROL, as part of the consortium, will participate in the project actions without requesting funding. EUROCONTROL will, however, fully engage in the project and in particular is committed to providing the effort, contributions to deliverables and to other activities as set out in this tender and in the accompanying administrative forms.

Table 3.1g: 'Subcontracting costs' items

1/EUROCONTROL		
	Cost (€)	**Description of tasks and justification**
Subcontracting	300.000	EUROCONTROL may have to outsource part of the software development associated with the interface between the prototype N-RMM and proprietary systems used for the technical testing. EUROCONTROL, as an international organisation, follows strict rules in terms of external assistance selection and procurement. These rules will be applied for the selection of the subcontracting parties in the framework of the project.

Table 3.1h: 'Purchase costs' items (travel and subsistence, equipment and other goods, works and services)

Not applicable.

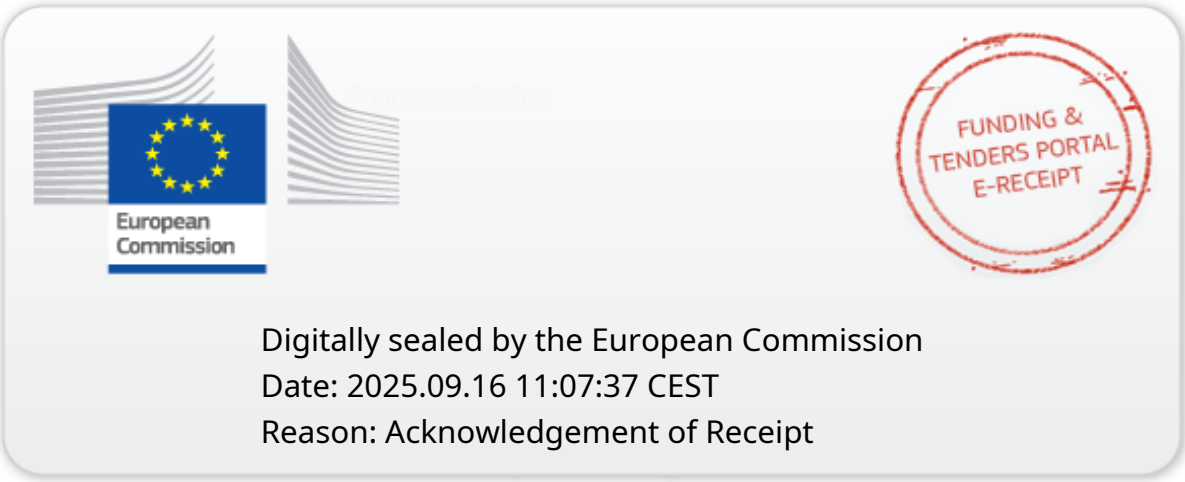
Table 3.1i: 'Other costs categories' items (e.g. internally invoiced goods and services)

Not applicable.

Table 3.1j: 'In-kind contributions' provided by third parties

Not applicable.

#§QUA-LIT-QL§# #§WRK-PLA-WP§#



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