GRANT AGREEMENT

Project 101286541 — HAVEN

PREAMBLE

This **Agreement** ('the Agreement') is **between** the following parties:

on the one part,

SESAR3 Joint Undertaking ('granting authority'), under the powers delegated by the European Commission ('European Commission'),

and

on the other part,

1. 'the coordinator':

THALES LAS FRANCE SAS (THALES LAS), PIC 999961555, established in AVENUE GAY LUSSAC 2, ELANCOURT 78990, France,

and the following other beneficiaries, if they sign their 'accession form' (see Annex 3 and Article 40):

2. **THALES AVS FRANCE SAS (THALES AVS)**, PIC 999984447, established in 75-77 AVENUE MARCEL DASSAULT, MERIGNAC 33700, France,

3. **DIRECTION DES SERVICES DE LA NAVIGATION AERIENNE (DSNA)**, PIC 928673636, established in 50 RUE HENRY FARMAN, PARIS 75720, France,

4. **LUFTFARTSVERKET (LFV)**, PIC 942346077, established in HOSPITALSGATAN 30, NORRKOPING 602 27, Sweden,

5. **NAVIAIR (NAVIAIR)**, PIC 923671249, established in NAVIAIR ALLE 1, KASTRUP 2770, Denmark,

6. **AUSTRO CONTROL OSTERREICHISCHE GESELLSCHAFT FUR ZIVILLUFTFAHRT MBH (ACG)**, PIC 998956635, established in SCHNIRCHGASSE 17, WIEN 1030, Austria,

7. **THE IRISH AIR NAVIGATION SERVICE (AIRNAV IRELAND)**, PIC 881850281, established in THE TIMES BUILDING D'OLIER STREET, DUBLIN D02 T449, Ireland,

8. **HRVATSKA KONTROLA ZRACNE PLOVIDBE DOO (CCL)**, PIC 924128216, established in RUDOLFA FIZIRA 2, VELIKA GORICA 10410, Croatia,

9. **NAVEGACAO AEREA DE PORTUGAL - NAV PORTUGAL EPE (NAV PORTUGAL)**, PIC 955596471, established in RUA D EDIFICIO 121 AEROPORTO DE, LISBOA 1700 008, Portugal,

10. **HUNGAROCONTROL MAGYAR LEGIFORGALMISZOLGALAT ZARTKORUEN MUKODO RESZVENYTARSASAG (HC)**, PIC 941767472, established in IGLO UTCA 33 35, BUDAPEST 1185, Hungary,

11. **SOPRA STERIA GROUP (SSG)**, PIC 951375807, established in ZAE LES GLAISINS 3 RUE DU PRE FAUCON, ANNECY LE VIEUX 74940, France,

12. **S.I.T.T.I. SPECIALE IMPIANTI TELESCRIVENTI TELEFONICI INTERNI SPA (SITTI)**, PIC 890100228, established in VIA CARDUCCI 8, MILANO 20123, Italy,

13. **ECOLE NATIONALE DE L AVIATION CIVILE (ENAC)**, PIC 996375756, established in AVENUE EDOUARD BELIN 7, TOULOUSE 31400, France,

14. **THALES (THALES CORTAIX)**, PIC 999751938, established in 4 RUE DE LA VERRERIE, MEUDON 92190, France,

Unless otherwise specified, references to 'beneficiary' or 'beneficiaries' include the coordinator and affiliated entities (if any).

If only one beneficiary signs the grant agreement ('mono-beneficiary grant'), all provisions referring to the 'coordinator' or the 'beneficiaries' will be considered — mutatis mutandis — as referring to the beneficiary.

The parties referred to above have agreed to enter into the Agreement.

By signing the Agreement and the accession forms, the beneficiaries accept the grant and agree to implement the action under their own responsibility and in accordance with the Agreement, with all the obligations and terms and conditions it sets out.

The Agreement is composed of:

Preamble

Terms and Conditions (including Data Sheet)

Annex 1 Description of the action[1]

Annex 2 Estimated budget for the action

Annex 3 Accession forms (if applicable)[2]

Annex 3a Declaration on joint and several liability of affiliated entities (if applicable)[3]

Annex 4 Model for the financial statements

Annex 5 Specific rules (if applicable)

[1] Template published on Portal Reference Documents.
[2] Template published on Portal Reference Documents.
[3] Template published on Portal Reference Documents.

TERMS AND CONDITIONS

TABLE OF CONTENTS

DATA SHEET

1. General data

Project summary:

Project summary
The HAVEN project aims to demonstrate the next generation of Air Traffic Services (ATS) platform for EN-ROUTE and Terminal Manoeuvring Area (TMA) operations. It involves key industry partners and major European Air Navigation Service Providers (ANSPs), addressing several topics including Artificial Intelligence, open architecture, flexible deployment, and Air Traffic Management (ATM) in the cloud. The project supports concepts like trajectory-based operations, demand capacity balancing, and environmentally friendly operations. It will also consider safety, cyber-security, standardisation, and certification with EASA support. The project is organized into two technological solutions: TS-1 "ATS platform support to advanced operational concepts in EN-ROUTE and TMA" focuses on supporting the operational concepts defined for EN-ROUTE and TMA. These will be defined in other WAs of the SESAR3 IR2 call, such as TBO, DCB, Civil/Military coordination etc. This solution will cover the way that the platform supports these different concepts and they will be prototyped and validated through real time simulations, with human in the loop (with ATC controllers involved). TS-2 "Next generation architecture and deployment architecture for ATS platform" is more technical and linked to the architecture, infrastructure and deployment patterns and intends to cover the impacts of the new service delivery model in the architecture. Transition aspects, as per the new service delivery model recommendation task force, will be studied to clarify how these services can be packaged to allow a smooth transition. Moreover, third parties services interchangability will be validated through a cross-project experimentation, and the benefit from the Cloud-ready platform, going one step further to implement different ways of deployment, taking advantage of the flexibility it offers, will be demonstrated.

Keywords:

- Demonstrate a complete set of advanced services and operations integrated or interoperable within a next generation ATS platform for en-route and TMA operations

Project number: 101286541

Project name: Highly Automated and Virtualised ATS Platform for EN-route and TMA Operations

Project acronym: HAVEN

Call: HORIZON-SESAR-2025-DES-IR-02

Topic: HORIZON-SESAR-2025-DES-IR-02-WA3-1

Type of action: HORIZON JU Research and Innovation Actions

Granting authority: SESAR3 Joint Undertaking

Grant managed through EU Funding & Tenders Portal: Yes (eGrants)

Project starting date: fixed date: 1 September 2026

Project end date: 31 August 2029

Project duration: 36 months

Consortium agreement: Yes

2. Participants

List of participants:

N°	Role	Short name	Legal name	Ctry	PIC	Max grant amount
1	COO	THALES LAS	THALES LAS FRANCE SAS	FR	999961555	17 957 316.60
2	BEN	THALES AVS	THALES AVS FRANCE SAS	FR	999984447	2 348 326.19
3	BEN	DSNA	DIRECTION DES SERVICES DE LA NAVIGATION AERIENNE	FR	928673636	1 239 700.00
4	BEN	LFV	LUFTFARTSVERKET	SE	942346077	536 633.38

N°	Role	Short name	Legal name	Ctry	PIC	Max grant amount
5	BEN	NAVIAIR	NAVIAIR	DK	923671249	116 666.34
6	BEN	ACG	AUSTRO CONTROL OSTERREICHISCHE GESELLSCHAFT FUR ZIVILLUFTFAHRT MBH	AT	998956635	116 292.76
7	BEN	AIRNAV IRELAND	THE IRISH AIR NAVIGATION SERVICE	IE	881850281	116 666.34
8	BEN	CCL	HRVATSKA KONTROLA ZRACNE PLOVIDBE DOO	HR	924128216	116 664.10
9	BEN	NAV PORTUGAL	NAVEGACAO AEREA DE PORTUGAL - NAV PORTUGAL EPE	PT	955596471	116 663.93
10	BEN	HC	HUNGAROCONTROL MAGYAR LEGIFORGALMISZOLGALAT ZARTKORUEN MUKODO RESZVENYTARSASAG	HU	941767472	91 883.32
11	BEN	SSG	SOPRA STERIA GROUP	FR	951375807	2 288 024.42
12	BEN	SITTI	S.I.T.T.I. SPECIALE IMPIANTI TELESCRIVENTI TELEFONICI INTERNI SPA	IT	890100228	1 950 060.00
13	BEN	ENAC	ECOLE NATIONALE DE L AVIATION CIVILE	FR	996375756	105 000.00
14	BEN	THALES CORTAIX	THALES	FR	999751938	400 000.00
Total						27 499 897.38

Coordinator:

– THALES LAS FRANCE SAS (THALES LAS)

3. Grant

Maximum grant amount, total estimated eligible costs and contributions and funding rate:

Maximum grant amount (Annex 2)	Maximum grant amount (award decision)
27 499 897.38	27 499 897.38

Grant form: Lump Sum

Grant mode: Action grant

Budget categories/activity types: Lump sum contributions

Cost eligibility options: n/a

Budget flexibility: No

4. Reporting, payments and recoveries

4.1 Continuous reporting (art 21)

Deliverables: see Funding & Tenders Portal Continuous Reporting tool

4.2 Periodic reporting and payments

Reporting and payment schedule (art 21, 22):

Reporting					Payments	
Reporting periods			Type	Deadline	Type	Deadline (time to pay)
RP No	Month from	Month to				
					Initial prefinancing	30 days from entry into force/10 days before starting date – whichever is the latest
1	1	18	Periodic report	60 days after end of reporting period	Interim payment	90 days from receiving periodic report
2	19	36	Periodic report	60 days after end of reporting period	Final payment	90 days from receiving periodic report

Prefinancing payments and guarantees:

Prefinancing payment	
Type	Amount
Prefinancing 1 (initial)	16 499 938.43

Reporting and payment modalities (art 21, 22):

Mutual Insurance Mechanism (MIM): Yes

MIM contribution: 5% of the maximum grant amount (1 374 994.87), retained from the initial prefinancing

Restrictions on distribution of initial prefinancing: The prefinancing may be distributed only if the minimum number of beneficiaries set out in the call condititions (if any) have acceded to the Agreement and only to beneficiaries that have acceded.

Interim payment ceiling (if any): 90% of the maximum grant amount

No-profit rule: n/a

Late payment interest: ECB + 3.5%

Bank account for payments:

FR7630004008130002173771051 BNPAFRPPXXX

Conversion into euros: n/a

Reporting language: Language of the Agreement

4.3 Certificates (art 24): n/a

4.4 Recoveries (art 22)

First-line liability for recoveries:

Beneficiary termination: Beneficiary concerned

Final payment: Each beneficiary for their own debt

After final payment: Beneficiary concerned

Joint and several liability for enforced recoveries (in case of non-payment):

Individual financial responsibility: Each beneficiary is liable only for its own debts (and those of its affiliated entities, if any)

Joint and several liability of affiliated entities — n/a

5. Consequences of non-compliance, applicable law & dispute settlement forum

Suspension and termination:

Additional suspension grounds (art 31)

Additional termination grounds (art 32)

Applicable law (art 43):

Standard applicable law regime: EU law + law of Belgium

Dispute settlement forum (art 43):

Standard dispute settlement forum:

EU beneficiaries: EU General Court + EU Court of Justice (on appeal)

Non-EU beneficiaries: Courts of Brussels, Belgium (unless an international agreement provides for the enforceability of EU court judgements)

6. Other

Specific rules (Annex 5): Yes

Standard time-limits after project end:

Confidentiality (for X years after final payment): 5

Record-keeping (for X years after final payment): 5 (or 3 for grants of not more than EUR 60 000)

Reviews (up to X years after final payment): 2

Audits (up to X years after final payment): 2

Extension of findings from other grants to this grant (no later than X years after final payment): 2

Impact evaluation (up to X years after final payment): 5 (or 3 for grants of not more than EUR 60 000)

CHAPTER 1 GENERAL

ARTICLE 1 — SUBJECT OF THE AGREEMENT

This Agreement sets out the rights and obligations and terms and conditions applicable to the grant awarded for the implementation of the action set out in Chapter 2.

ARTICLE 2 — DEFINITIONS

For the purpose of this Agreement, the following definitions apply:

Actions — The project which is being funded in the context of this Agreement.

Grant — The grant awarded in the context of this Agreement.

EU grants — Grants awarded by EU institutions, bodies, offices or agencies (including EU executive agencies, EU regulatory agencies, EDA, joint undertakings, etc.).

Participants — Entities participating in the action as beneficiaries, affiliated entities, associated partners, third parties giving in-kind contributions, subcontractors or recipients of financial support to third parties.

Beneficiaries (BEN) — The signatories of this Agreement (either directly or through an accession form).

Affiliated entities (AE) — Entities affiliated to a beneficiary within the meaning of Article 190 of EU Financial Regulation 2024/2509[4] which participate in the action with similar rights and obligations as the beneficiaries (obligation to implement action tasks and right to charge costs and claim contributions).

Associated partners (AP) — Entities which participate in the action, but without the right to charge costs or claim contributions.

Purchases — Contracts for goods, works or services needed to carry out the action (e.g. equipment, consumables and supplies) but which are not part of the action tasks (see Annex 1).

Subcontracting — Contracts for goods, works or services that are part of the action tasks (see Annex 1).

In-kind contributions — In-kind contributions within the meaning of Article 2(38) of EU Financial Regulation 2024/2509, i.e. non-financial resources made available free of charge by third parties.

[4] For the definition, see Article 190 Regulation (EU, Euratom) 2024/2509 of the European Parliament and of the Council of 23 September 2024 on the financial rules applicable to the general budget of the Union (recast) ('EU Financial Regulation') (OJ L, 2024/2509, 26.9.2024): "**affiliated entities** [are]:
(a) entities that form a sole beneficiary [(i.e. where an entity is formed of several entities that satisfy the criteria for being awarded a grant, including where the entity is specifically established for the purpose of implementing an action to be financed by a grant)];
(b) entities that satisfy the eligibility criteria and that do not fall within one of the situations referred to in Article 138(1) and 143(1) and that have a link with the beneficiary, in particular a legal or capital link, which is neither limited to the action nor established for the sole purpose of its implementation".

Fraud — Fraud within the meaning of Article 3 of EU Directive 2017/1371[5] and Article 1 of the Convention on the protection of the European Communities' financial interests, drawn up by the Council Act of 26 July 1995[6], as well as any other wrongful or criminal deception intended to result in financial or personal gain.

Irregularities — Any type of breach (regulatory or contractual) which could impact the EU financial interests, including irregularities within the meaning of Article 1(2) of EU Regulation 2988/95[7].

Grave professional misconduct — Any type of unacceptable or improper behaviour in exercising one's profession, especially by employees, including grave professional misconduct within the meaning of Article 138(1)(c) of EU Financial Regulation 2024/2509[8].

Applicable EU, international and national law — Any legal acts or other (binding or non-binding) rules and guidance in the area concerned.

Portal — EU Funding & Tenders Portal; electronic portal and exchange system managed by the European Commission and used by itself and other EU institutions, bodies, offices or agencies for the management of their funding programmes (grants, procurements, prizes, etc.).

CHAPTER 2 ACTION

ARTICLE 3 — ACTION

The grant is awarded for the action **101286541** — **HAVEN** ('action'), as described in Annex 1.

ARTICLE 4 — DURATION AND STARTING DATE

The duration and the starting date of the action are set out in the Data Sheet (see Point 1).

CHAPTER 3 GRANT

ARTICLE 5 — GRANT

5.1 Form of grant

[5] Directive (EU) 2017/1371 of the European Parliament and of the Council of 5 July 2017 on the fight against fraud to the Union's financial interests by means of criminal law (OJ L 198, 28.7.2017, p. 29).

[6] OJ C 316, 27.11.1995, p. 48.

[7] Council Regulation (EC, Euratom) No 2988/95 of 18 December 1995 on the protection of the European Communities financial interests (OJ L 312, 23.12.1995, p. 1).

[8] 'Professional misconduct' includes, in particular, the following: violation of ethical standards of the profession; wrongful conduct with impact on professional credibility; breach of generally accepted professional ethical standards; false declarations/misrepresentation of information; participation in a cartel or other agreement distorting competition; violation of IPR; attempting to influence decision-making processes by taking advantage, through misrepresentation, of a conflict of interests, or to obtain confidential information from public authorities to gain an advantage; incitement to discrimination, hatred or violence or similar activities contrary to the EU values where negatively affecting or risking to affect the performance of a legal commitment.

The grant is an action grant[9] which takes the form of a lump sum grant for the completion of work packages.

5.2 Maximum grant amount

The maximum grant amount is set out in the Data Sheet (see Point 3) and in the estimated budget (Annex 2).

5.3 Funding rate

Not applicable

5.4 Estimated budget, budget categories and forms of funding

The estimated budget for the action (lump sum breakdown) is set out in Annex 2.

It contains the estimated eligible contributions for the action (lump sum contributions), broken down by participant and work package.

Annex 2 also shows the types of contributions (forms of funding)[10] to be used for each work package.

5.5 Budget flexibility

Budget flexibility does not apply; changes to the estimated budget (lump sum breakdown) always require an amendment (see Article 39).

Amendments for transfers between *work packages* are moreover possible only if:

- the work packages concerned are not already completed (and declared in a financial statement) and
- the transfers are justified by the technical implementation of the action.

ARTICLE 6 — ELIGIBLE AND INELIGIBLE CONTRIBUTIONS

6.1 and 6.2 General and specific eligibility conditions

Lump sum contributions are eligible ('eligible contributions'), if:

(a) they are set out in Annex 2 and

(b) the work packages are completed and the work is properly implemented by the beneficiaries and/or the results are achieved, in accordance with Annex 1 and during in the period set out in Article 4 (with the exception of work/results relating to the submission of the final periodic report, which may be achieved afterwards; see Article 21)

They will be calculated on the basis of the amounts set out in Annex 2.

[9] For the definition, see Article 183(2)(a) EU Financial Regulation 2024/2509: '**action grant**' means an EU grant to finance "an action intended to help achieve a Union policy objective".

[10] See Article 125 EU Financial Regulation 2024/2509.

6.3 Ineligible contributions

'Ineligible contributions' are:

(a) lump sum contributions that do not comply with the conditions set out above (see Article 6.1 and 6.2)

(b) lump sum contributions for activities already funded under other EU grants (or grants awarded by an EU Member State, non-EU country or other body implementing the EU budget), except for the following case:

(i) Synergy actions: not applicable

(c) other:

(i) country restrictions for eligible costs: not applicable.

6.4 Consequences of non-compliance

If a beneficiary declares lump sum contributions that are ineligible, they will be rejected (see Article 27).

This may also lead to other measures described in Chapter 5.

CHAPTER 4 GRANT IMPLEMENTATION

SECTION 1 CONSORTIUM: BENEFICIARIES, AFFILIATED ENTITIES AND OTHER PARTICIPANTS

ARTICLE 7 — BENEFICIARIES

The beneficiaries, as signatories of the Agreement, are fully responsible towards the granting authority for implementing it and for complying with all its obligations.

They must implement the Agreement to their best abilities, in good faith and in accordance with all the obligations and terms and conditions it sets out.

They must have the appropriate resources to implement the action and implement the action under their own responsibility and in accordance with Article 11. If they rely on affiliated entities or other participants (see Articles 8 and 9), they retain sole responsibility towards the granting authority and the other beneficiaries.

They are jointly responsible for the *technical* implementation of the action. If one of the beneficiaries fails to implement their part of the action, the other beneficiaries must ensure that this part is implemented by someone else (without being entitled to an increase of the maximum grant amount and subject to an amendment; see Article 39). The *financial* responsibility of each beneficiary in case of recoveries is governed by Article 22.

The beneficiaries (and their action) must remain eligible under the EU programme funding the grant

for the entire duration of the action. Lump sum contributions will be eligible only as long as the beneficiary and the action are eligible.

The **internal roles and responsibilities** of the beneficiaries are divided as follows:

(a) Each beneficiary must:

(i) keep information stored in the Portal Participant Register up to date (see Article 19)

(ii) inform the granting authority (and the other beneficiaries) immediately of any events or circumstances likely to affect significantly or delay the implementation of the action (see Article 19)

(iii) submit to the coordinator in good time:

- the prefinancing guarantees (if required; see Article 23)
- the financial statements and certificates on the financial statements (CFS): not applicable
- the contribution to the deliverables and technical reports (see Article 21)
- any other documents or information required by the granting authority under the Agreement

(iv) submit via the Portal data and information related to the participation of their affiliated entities.

(b) The coordinator must:

(i) monitor that the action is implemented properly (see Article 11)

(ii) act as the intermediary for all communications between the consortium and the granting authority, unless the Agreement or granting authority specifies otherwise, and in particular:

- submit the prefinancing guarantees to the granting authority (if any)
- request and review any documents or information required and verify their quality and completeness before passing them on to the granting authority
- submit the deliverables and reports to the granting authority
- inform the granting authority about the payments made to the other beneficiaries (report on the distribution of payments; if required, see Articles 22 and 32)

(iii) distribute the payments received from the granting authority to the other beneficiaries without unjustified delay (see Article 22).

The coordinator may not delegate or subcontract the above-mentioned tasks to any other beneficiary or third party (including affiliated entities).

However, coordinators which are public bodies may delegate the tasks set out in Point (b)(ii) last

indent and (iii) above to entities with 'authorisation to administer' which they have created or which are controlled by or affiliated to them. In this case, the coordinator retains sole responsibility for the payments and for compliance with the obligations under the Agreement.

Moreover, coordinators which are 'sole beneficiaries'[11] (or similar, such as European research infrastructure consortia (ERICs)) may delegate the tasks set out in Point (b)(i) to (iii) above to one of their members. The coordinator retains sole responsibility for compliance with the obligations under the Agreement.

The beneficiaries must have **internal arrangements** regarding their operation and co-ordination, to ensure that the action is implemented properly.

If required by the granting authority (see Data Sheet, Point 1), these arrangements must be set out in a written **consortium agreement** between the beneficiaries, covering for instance:

- the internal organisation of the consortium
- the management of access to the Portal
- different distribution keys for the payments and financial responsibilities in case of recoveries (if any)
- additional rules on rights and obligations related to background and results (see Article 16)
- settlement of internal disputes
- liability, indemnification and confidentiality arrangements between the beneficiaries.

The internal arrangements must not contain any provision contrary to this Agreement.

ARTICLE 8 — AFFILIATED ENTITIES

Not applicable

ARTICLE 9 — OTHER PARTICIPANTS INVOLVED IN THE ACTION

9.1 Associated partners

Not applicable

9.2 Third parties giving in-kind contributions to the action

Other third parties may give in-kind contributions to the action (i.e. personnel, equipment, other goods, works and services, etc. which are free-of-charge) if necessary for the implementation.

Third parties giving in-kind contributions do not implement any action tasks. They may not charge contributions to the action (no lump sum contributions) and their costs are considered entirely covered by the lump sum contributions paid to the beneficiaries.

[11] For the definition, see Article 190(2) EU Financial Regulation 2024/2509: "Where several entities satisfy the criteria for being awarded a grant and together form one entity, that entity may be treated as the **sole beneficiary**, including where it is specifically established for the purpose of implementing the action financed by the grant."

The third parties and their in-kind contributions should be set out in Annex 1.

9.3 Subcontractors

Subcontractors may participate in the action, if necessary for the implementation.

Subcontractors must implement their action tasks in accordance with Article 11. The beneficiaries' costs for subcontracting are considered entirely covered by the lump sum contributions for implementing the work packages (irrespective of the actual subcontracting costs incurred, if any).

The beneficiaries must ensure that their contractual obligations under Articles 11 (proper implementation), 12 (conflict of interest), 13 (confidentiality and security), 14 (ethics), 17.2 (visibility), 18 (specific rules for carrying out action), 19 (information) and 20 (record-keeping) also apply to the subcontractors.

The beneficiaries must ensure that the bodies mentioned in Article 25 (e.g. granting authority, OLAF, Court of Auditors (ECA), etc.) can exercise their rights also towards the subcontractors.

9.4 Recipients of financial support to third parties

If the action includes providing financial support to third parties (e.g. grants, prizes or similar forms of support), the beneficiaries must ensure that their contractual obligations under Articles 12 (conflict of interest), 13 (confidentiality and security), 14 (ethics), 17.2 (visibility), 18 (specific rules for carrying out action), 19 (information) and 20 (record-keeping)also apply to the third parties receiving the support (recipients).

The beneficiaries must also ensure that the bodies mentioned in Article 25 (e.g. granting authority, OLAF, Court of Auditors (ECA), etc.) can exercise their rights also towards the recipients.

ARTICLE 10 — PARTICIPANTS WITH SPECIAL STATUS

10.1 Non-EU participants

Participants which are established in a non-EU country (if any) undertake to comply with their obligations under the Agreement and:

- to respect general principles (including fundamental rights, values and ethical principles, environmental and labour standards, rules on classified information, intellectual property rights, visibility of funding and protection of personal data)
- for the submission of certificates under Article 24: use qualified external auditors which are independent and comply with comparable standards as those set out in EU Directive 2006/43/EC[12]
- for the controls under Article 25: allow for checks, reviews, audits and investigations (including on-the-spot checks, visits and inspections) by the bodies mentioned in that Article (e.g. granting authority, OLAF, Court of Auditors (ECA), etc.).

[12] Directive 2006/43/EC of the European Parliament and of the Council of 17 May 2006 on statutory audits of annual accounts and consolidated accounts (OJ L 157, 9.6.2006, p. 87).

Special rules on dispute settlement apply (see Data Sheet, Point 5).

10.2 Participants which are international organisations

Participants which are international organisations (IOs; if any) undertake to comply with their obligations under the Agreement and:

- to respect general principles (including fundamental rights, values and ethical principles, environmental and labour standards, rules on classified information, intellectual property rights, visibility of funding and protection of personal data)
- for the submission of certificates under Article 24: to use either independent public officers or external auditors which comply with comparable standards as those set out in EU Directive 2006/43/EC[13]
- for the controls under Article 25: to allow for the checks, reviews, audits and investigations by the bodies mentioned in that Article, taking into account the specific agreements concluded by them and the EU (if any).

For such participants, nothing in the Agreement will be interpreted as a waiver of their privileges or immunities, as accorded by their constituent documents or international law.

Special rules on applicable law and dispute settlement apply (see Article 43 and Data Sheet, Point 5).

10.3 Pillar-assessed participants

Pillar-assessed participants (if any) may rely on their own systems, rules and procedures, in so far as they have been positively assessed and do not call into question the decision awarding the grant or breach the principle of equal treatment of applicants or beneficiaries.

'Pillar-assessment' means a review by the European Commission on the systems, rules and procedures which participants use for managing EU grants (in particular internal control system, accounting system, external audits, financing of third parties, rules on recovery and exclusion, information on recipients and protection of personal data; see Article 157 EU Financial Regulation 2024/2509).

Participants with a positive pillar assessment may rely on their own systems, rules and procedures, in particular for:

- record-keeping (Article 20): may be done in accordance with internal standards, rules and procedures
- currency conversion for financial statements (Article 21): may be done in accordance with usual accounting practices
- guarantees (Article 23): for public law bodies, prefinancing guarantees are not needed
- certificates (Article 24):
    - certificates on the financial statements (CFS): may be provided by their regular internal

[13] Directive 2006/43/EC of the European Parliament and of the Council of 17 May 2006 on statutory audits of annual accounts and consolidated accounts (OJ L 157, 9.6.2006, p. 87).

or external auditors and in accordance with their internal financial regulations and procedures

- certificates on usual accounting practices (CoMUC): are not needed if those practices are covered by an ex-ante assessment

and use the following specific rules, for:

- recoveries (Article 22): in case of financial support to third parties, there will be no recovery if the participant has done everything possible to retrieve the undue amounts from the third party receiving the support (including legal proceedings) and non-recovery is not due to an error or negligence on its part

- checks, reviews, audits and investigations by the EU (Article 25): will be conducted taking into account the rules and procedures specifically agreed between them and the framework agreement (if any)

- impact evaluation (Article 26): will be conducted in accordance with the participant's internal rules and procedures and the framework agreement (if any)

- grant agreement termination (Article 32): the final grant amount and final payment will be calculated taking into account also costs relating to contracts due for execution only after termination takes effect, if the contract was entered into before the pre-information letter was received and could not reasonably be terminated on legal grounds

- liability for damages (Article 33.2): the granting authority must be compensated for damage it sustains as a result of the implementation of the action or because the action was not implemented in full compliance with the Agreement only if the damage is due to an infringement of the participant's internal rules and procedures or due to a violation of third parties' rights by the participant or one of its employees or individual for whom the employees are responsible.

Participants whose pillar assessment covers procurement and granting procedures may also do purchases, subcontracting and financial support to third parties (Article 6.2) in accordance with their internal rules and procedures for purchases, subcontracting and financial support.

Participants whose pillar assessment covers data protection rules may rely on their internal standards, rules and procedures for data protection (Article 15).

The participants may however not rely on provisions which would breach the principle of equal treatment of applicants or beneficiaries or call into question the decision awarding the grant, such as in particular:

- eligibility (Article 6)

- consortium roles and set-up (Articles 7-9)

- security and ethics (Articles 13, 14)

- IPR (including background and results, access rights and rights of use), communication, dissemination and visibility (Articles 16 and 17)

- information obligation (Article 19)
- payment, reporting and amendments (Articles 21, 22 and 39)
- rejections, reductions, suspensions and terminations (Articles 27, 28, 29-32)

If the pillar assessment was subject to remedial measures, reliance on the internal systems, rules and procedures is subject to compliance with those remedial measures.

Participants must inform the coordinator without delay of any changes to the systems, rules and procedures that were part of the pillar assessment. The coordinator must immediately inform the granting authority.

Pillar-assessed participants that have also concluded a framework agreement with the EU, may moreover — under the same conditions as those above (i.e. not call into question the decision awarding the grant or breach the principle of equal treatment of applicants or beneficiaries) — rely on provisions set out in that framework agreement.

SECTION 2 RULES FOR CARRYING OUT THE ACTION

ARTICLE 11 — PROPER IMPLEMENTATION OF THE ACTION

11.1 Obligation to properly implement the action

The beneficiaries must implement the action as described in Annex 1 and in compliance with the provisions of the Agreement, the call conditions and all legal obligations under applicable EU, international and national law.

11.2 Consequences of non-compliance

If a beneficiary breaches any of its obligations under this Article, the grant may be reduced (see Article 28).

Such breaches may also lead to other measures described in Chapter 5.

ARTICLE 12 — CONFLICT OF INTERESTS

12.1 Conflict of interests

The beneficiaries must take all measures to prevent any situation where the impartial and objective implementation of the Agreement could be compromised for reasons involving family, emotional life, political or national affinity, economic interest or any other direct or indirect interest (‘conflict of interests’).

They must formally notify the granting authority without delay of any situation constituting or likely to lead to a conflict of interests and immediately take all the necessary steps to rectify this situation.

The granting authority may verify that the measures taken are appropriate and may require additional measures to be taken by a specified deadline.

12.2 Consequences of non-compliance

If a beneficiary breaches any of its obligations under this Article, the grant may be reduced (see Article 28) and the grant or the beneficiary may be terminated (see Article 32).

Such breaches may also lead to other measures described in Chapter 5.

ARTICLE 13 — CONFIDENTIALITY AND SECURITY

13.1 Sensitive information

The parties must keep confidential any data, documents or other material (in any form) that is identified as sensitive in writing ('sensitive information') — during the implementation of the action and for at least until the time-limit set out in the Data Sheet (see Point 6).

If a beneficiary requests, the granting authority may agree to keep such information confidential for a longer period.

Unless otherwise agreed between the parties, they may use sensitive information only to implement the Agreement.

The beneficiaries may disclose sensitive information to their personnel or other participants involved in the action only if they:

(a) need to know it in order to implement the Agreement and

(b) are bound by an obligation of confidentiality.

The granting authority may disclose sensitive information to its staff and to other EU institutions and bodies.

It may moreover disclose sensitive information to third parties, if:

(a) this is necessary to implement the Agreement or safeguard the EU financial interests and

(b) the recipients of the information are bound by an obligation of confidentiality.

The confidentiality obligations no longer apply if:

(a) the disclosing party agrees to release the other party

(b) the information becomes publicly available, without breaching any confidentiality obligation

(c) the disclosure of the sensitive information is required by EU, international or national law.

Specific confidentiality rules (if any) are set out in Annex 5.

13.2 Classified information

The parties must handle classified information in accordance with the applicable EU, international or national law on classified information (in particular, Decision 2015/444[14] and its implementing rules).

[14] Commission Decision 2015/444/EC, Euratom of 13 March 2015 on the security rules for protecting EU classified information (OJ L 72, 17.3.2015, p. 53).

Deliverables which contain classified information must be submitted according to special procedures agreed with the granting authority.

Action tasks involving classified information may be subcontracted only after explicit approval (in writing) from the granting authority.

Classified information may not be disclosed to any third party (including participants involved in the action implementation) without prior explicit written approval from the granting authority.

Specific security rules (if any) are set out in Annex 5.

13.3 Consequences of non-compliance

If a beneficiary breaches any of its obligations under this Article, the grant may be reduced (see Article 28).

Such breaches may also lead to other measures described in Chapter 5.

ARTICLE 14 — ETHICS AND VALUES

14.1 Ethics

The action must be carried out in line with the highest ethical standards and the applicable EU, international and national law on ethical principles.

Specific ethics rules (if any) are set out in Annex 5.

14.2 Values

The beneficiaries must commit to and ensure the respect of basic EU values (such as respect for human dignity, freedom, democracy, equality, the rule of law and human rights, including the rights of minorities).

Specific rules on values (if any) are set out in Annex 5.

14.3 Consequences of non-compliance

If a beneficiary breaches any of its obligations under this Article, the grant may be reduced (see Article 28).

Such breaches may also lead to other measures described in Chapter 5.

ARTICLE 15 — DATA PROTECTION

15.1 Data processing by the granting authority

Any personal data under the Agreement will be processed under the responsibility of the data controller of the granting authority in accordance with and for the purposes set out in the Portal Privacy Statement.

For grants where the granting authority is the European Commission, an EU regulatory or executive agency, joint undertaking or other EU body, the processing will be subject to Regulation 2018/1725[15].

15.2 Data processing by the beneficiaries

The beneficiaries must process personal data under the Agreement in compliance with the applicable EU, international and national law on data protection (in particular, Regulation 2016/679[16]).

They must ensure that personal data is:

- processed lawfully, fairly and in a transparent manner in relation to the data subjects
- collected for specified, explicit and legitimate purposes and not further processed in a manner that is incompatible with those purposes
- adequate, relevant and limited to what is necessary in relation to the purposes for which they are processed
- accurate and, where necessary, kept up to date
- kept in a form which permits identification of data subjects for no longer than is necessary for the purposes for which the data is processed and
- processed in a manner that ensures appropriate security of the data.

The beneficiaries may grant their personnel access to personal data only if it is strictly necessary for implementing, managing and monitoring the Agreement. The beneficiaries must ensure that the personnel is under a confidentiality obligation.

The beneficiaries must inform the persons whose data are transferred to the granting authority and provide them with the Portal Privacy Statement.

15.3 Consequences of non-compliance

If a beneficiary breaches any of its obligations under this Article, the grant may be reduced (see Article 28).

Such breaches may also lead to other measures described in Chapter 5.

ARTICLE 16 — INTELLECTUAL PROPERTY RIGHTS (IPR) — BACKGROUND AND RESULTS —ACCESS RIGHTS AND RIGHTS OF USE

16.1 Background and access rights to background

[15] Regulation (EU) 2018/1725 of the European Parliament and of the Council of 23 October 2018 on the protection of natural persons with regard to the processing of personal data by the Union institutions, bodies, offices and agencies and on the free movement of such data, and repealing Regulation (EC) No 45/2001 and Decision No 1247/2002/EC (OJ L 295, 21.11.2018, p. 39).

[16] Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (‘GDPR’) (OJ L 119, 4.5.2016, p. 1).

The beneficiaries must give each other and the other participants access to the background identified as needed for implementing the action, subject to any specific rules in Annex 5.

'Background' means any data, know-how or information — whatever its form or nature (tangible or intangible), including any rights such as intellectual property rights — that is:

(a) held by the beneficiaries before they acceded to the Agreement and

(b) needed to implement the action or exploit the results.

If background is subject to rights of a third party, the beneficiary concerned must ensure that it is able to comply with its obligations under the Agreement.

16.2 Ownership of results

The granting authority does not obtain ownership of the results produced under the action.

'Results' means any tangible or intangible effect of the action, such as data, know-how or information, whatever its form or nature, whether or not it can be protected, as well as any rights attached to it, including intellectual property rights.

16.3 Rights of use of the granting authority on materials, documents and information received for policy, information, communication, dissemination and publicity purposes

The granting authority has the right to use non-sensitive information relating to the action and materials and documents received from the beneficiaries (notably summaries for publication, deliverables, as well as any other material, such as pictures or audio-visual material, in paper or electronic form) for policy information, communication, dissemination and publicity purposes — during the action or afterwards.

The right to use the beneficiaries' materials, documents and information is granted in the form of a royalty-free, non-exclusive and irrevocable licence, which includes the following rights:

(a) **use for its own purposes** (in particular, making them available to persons working for the granting authority or any other EU service (including institutions, bodies, offices, agencies, etc.) or EU Member State institution or body; copying or reproducing them in whole or in part, in unlimited numbers; and communication through press information services)

(b) **distribution to the public** (in particular, publication as hard copies and in electronic or digital format, publication on the internet, as a downloadable or non-downloadable file, broadcasting by any channel, public display or presentation, communicating through press information services, or inclusion in widely accessible databases or indexes)

(c) **editing or redrafting** (including shortening, summarising, inserting other elements (e.g. meta-data, legends, other graphic, visual, audio or text elements), extracting parts (e.g. audio or video files), dividing into parts, use in a compilation)

(d) **translation**

(e) **storage** in paper, electronic or other form

(f) **archiving**, in line with applicable document-management rules

(g) the right to authorise **third parties** to act on its behalf or sub-license to third parties the modes of use set out in Points (b), (c), (d) and (f), if needed for the information, communication and publicity activity of the granting authority and

(h) **processing**, analysing, aggregating the materials, documents and information received and **producing derivative works**.

The rights of use are granted for the whole duration of the industrial or intellectual property rights concerned.

If materials or documents are subject to moral rights or third party rights (including intellectual property rights or rights of natural persons on their image and voice), the beneficiaries must ensure that they comply with their obligations under this Agreement (in particular, by obtaining the necessary licences and authorisations from the rights holders concerned).

Where applicable, the granting authority will insert the following information:

"© – [year] – [name of the copyright owner]. All rights reserved. Licensed to the [name of granting authority] under conditions."

16.4 Specific rules on IPR, results and background

Specific rules regarding intellectual property rights, results and background (if any) are set out in Annex 5.

16.5 Consequences of non-compliance

If a beneficiary breaches any of its obligations under this Article, the grant may be reduced (see Article 28).

Such a breach may also lead to other measures described in Chapter 5.

ARTICLE 17 — COMMUNICATION, DISSEMINATION AND VISIBILITY

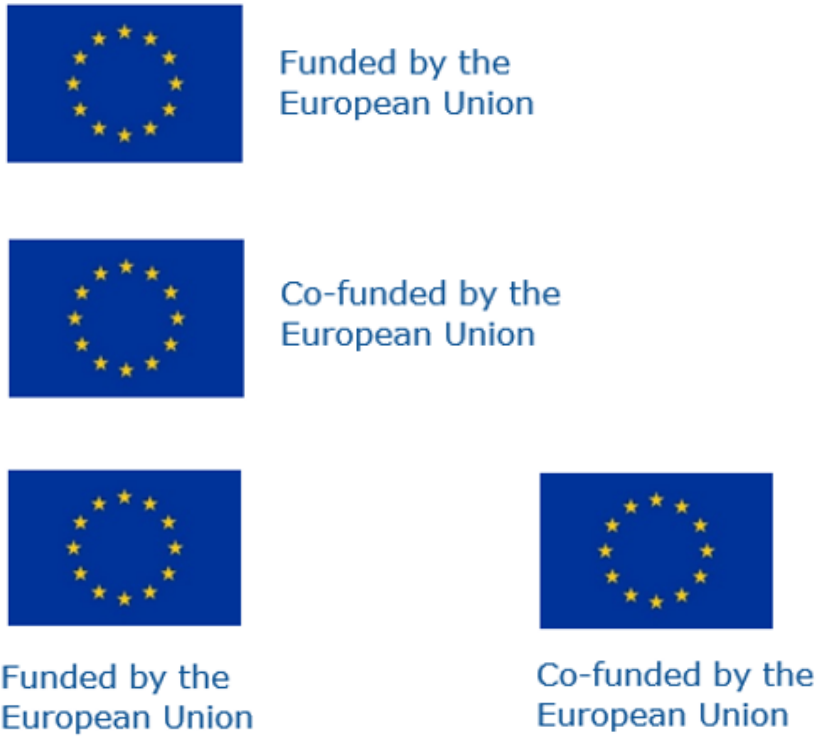
17.1 Communication — Dissemination — Promoting the action

Unless otherwise agreed with the granting authority, the beneficiaries must promote the action and its results by providing targeted information to multiple audiences (including the media and the public), in accordance with Annex 1 and in a strategic, coherent and effective manner.

Before engaging in a communication or dissemination activity expected to have a major media impact, the beneficiaries must inform the granting authority.

17.2 Visibility — European flag and funding statement

Unless otherwise agreed with the granting authority, communication activities of the beneficiaries related to the action (including media relations, conferences, seminars, information material, such as brochures, leaflets, posters, presentations, etc., in electronic form, via traditional or social media, etc.), dissemination activities and any infrastructure, equipment, vehicles, supplies or major result funded by the grant must acknowledge the EU support and display the European flag (emblem) and funding statement (translated into local languages, where appropriate):



The emblem must remain distinct and separate and cannot be modified by adding other visual marks, brands or text.

Apart from the emblem, no other visual identity or logo may be used to highlight the EU support.

When displayed in association with other logos (e.g. of beneficiaries or sponsors), the emblem must be displayed at least as prominently and visibly as the other logos.

For the purposes of their obligations under this Article, the beneficiaries may use the emblem without first obtaining approval from the granting authority. This does not, however, give them the right to exclusive use. Moreover, they may not appropriate the emblem or any similar trademark or logo, either by registration or by any other means.

17.3 Quality of information — Disclaimer

Any communication or dissemination activity related to the action must use factually accurate information.

Moreover, it must indicate the following disclaimer (translated into local languages where appropriate):

> "Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or [name of the granting authority]. Neither the European Union nor the granting authority can be held responsible for them."

17.4 Specific communication, dissemination and visibility rules

Specific communication, dissemination and visibility rules (if any) are set out in Annex 5.

17.5 Consequences of non-compliance

If a beneficiary breaches any of its obligations under this Article, the grant may be reduced (see Article 28).

Such breaches may also lead to other measures described in Chapter 5.

ARTICLE 18 — SPECIFIC RULES FOR CARRYING OUT THE ACTION

18.1 Specific rules for carrying out the action

Specific rules for implementing the action (if any) are set out in Annex 5.

18.2 Consequences of non-compliance

If a beneficiary breaches any of its obligations under this Article, the grant may be reduced (see Article 28).

Such a breach may also lead to other measures described in Chapter 5.

SECTION 3 GRANT ADMINISTRATION

ARTICLE 19 — GENERAL INFORMATION OBLIGATIONS

19.1 Information requests

The beneficiaries must provide — during the action or afterwards and in accordance with Article 7 — any information requested in order to verify eligibility of the lump sum contributions declared, proper implementation of the action and compliance with the other obligations under the Agreement.

The information provided must be accurate, precise and complete and in the format requested, including electronic format.

19.2 Participant Register data updates

The beneficiaries must keep — at all times, during the action or afterwards — their information stored in the Portal Participant Register up to date, in particular, their name, address, legal representatives, legal form and organisation type.

19.3 Information about events and circumstances which impact the action

The beneficiaries must immediately inform the granting authority (and the other beneficiaries) of any of the following:

(a) **events** which are likely to affect or delay the implementation of the action or affect the EU's financial interests, in particular:

(i) changes in their legal, financial, technical, organisational or ownership situation (including changes linked to one of the exclusion grounds listed in the declaration of honour signed before grant signature)

(ii) linked action information: not applicable

(b) **circumstances** affecting:

(i) the decision to award the grant or

(ii) compliance with requirements under the Agreement.

19.4 Consequences of non-compliance

If a beneficiary breaches any of its obligations under this Article, the grant may be reduced (see Article 28).

Such breaches may also lead to other measures described in Chapter 5.

ARTICLE 20 — RECORD-KEEPING

20.1 Keeping records and supporting documents

The beneficiaries must — at least until the time-limit set out in the Data Sheet (see Point 6) — keep records and other supporting documents to prove the proper implementation of the action (proper implementation of the work and/or achievement of the results as described in Annex 1) in line with the accepted standards in the respective field (if any); beneficiaries do not need to keep specific records on the actual costs incurred.

The records and supporting documents must be made available upon request (see Article 19) or in the context of checks, reviews, audits or investigations (see Article 25).

If there are on-going checks, reviews, audits, investigations, litigation or other pursuits of claims under the Agreement (including the extension of findings; see Article 25), the beneficiaries must keep these records and other supporting documentation until the end of these procedures.

The beneficiaries must keep the original documents. Digital and digitalised documents are considered originals if they are authorised by the applicable national law. The granting authority may accept non-original documents if they offer a comparable level of assurance.

20.2 Consequences of non-compliance

If a beneficiary breaches any of its obligations under this Article, lump sum contributions insufficiently substantiated will be ineligible (see Article 6) and will be rejected (see Article 27), and the grant may be reduced (see Article 28).

Such breaches may also lead to other measures described in Chapter 5.

ARTICLE 21 — REPORTING

21.1 Continuous reporting

The beneficiaries must report on the progress of the action (e.g. **deliverables, milestones, outputs/ outcomes, critical risks, indicators,** etc; if any), in the Portal Continuous Reporting tool and in accordance with the timing and conditions it sets out (as agreed with the granting authority).

Standardised deliverables (e.g. progress reports not linked to payments, reports on cumulative expenditure, special reports, etc; if any) must be submitted using the templates published on the Portal.

21.2 Periodic reporting: Technical reports and financial statements

In addition, the beneficiaries must provide reports to request payments, in accordance with the schedule and modalities set out in the Data Sheet (see Point 4.2):

- for additional prefinancings (if any): **an additional prefinancing report**
- for interim payments (if any) and the final payment: a **periodic report**

The prefinancing and periodic reports include a technical and financial part.

The technical part includes an overview of the action implementation. It must be prepared using the template available in the Portal Periodic Reporting tool.

The financial part of the additional prefinancing report includes a statement on the use of the previous prefinancing payment.

The financial part of the periodic report includes:

- the financial statement (consolidated statement for the consortium)
- the explanation on the use of resources (or detailed cost reporting table): not applicable
- the certificates on the financial statements (CFS): not applicable.

The **financial statement** must contain the lump sum contributions indicated in Annex 2, for the work packages that were completed during the reporting period.

For the last reporting period, the beneficiaries may exceptionally also declare partial lump sum contributions for work packages that were not completed (e.g. due to force majeure or technical impossibility).

Lump sum contributions which are not declared in a financial statement will not be taken into account by the granting authority.

By signing the financial statement (directly in the Portal Periodic Reporting tool), the coordinator confirms (on behalf of the consortium) that:

- the information provided is complete, reliable and true
- the lump sum contributions declared are eligible (in particular, the work packages have been completed, that the work has been properly implemented and/or the results were achieved in accordance with Annex 1; see Article 6)
- the proper implementation and/or achievement can be substantiated by adequate records and supporting documents (see Article 20) that will be produced upon request (see Article 19) or in the context of checks, reviews, audits and investigations (see Article 25).

In case of recoveries (see Article 22), beneficiaries will be held responsible also for the lump sum contributions declared for their affiliated entities (if any).

21.3 Currency for financial statements and conversion into euros

The financial statements must be drafted in euro.

21.4 Reporting language

The reporting must be in the language of the Agreement, unless otherwise agreed with the granting authority (see Data Sheet, Point 4.2).

21.5 Consequences of non-compliance

If a report submitted does not comply with this Article, the granting authority may suspend the payment deadline (see Article 29) and apply other measures described in Chapter 5.

If the coordinator breaches its reporting obligations, the granting authority may terminate the grant or the coordinator's participation (see Article 32) or apply other measures described in Chapter 5.

ARTICLE 22 — PAYMENTS AND RECOVERIES — CALCULATION OF AMOUNTS DUE

22.1 Payments and payment arrangements

Payments will be made in accordance with the schedule and modalities set out in the Data Sheet (see Point 4.2).

They will be made in euro to the bank account indicated by the coordinator (see Data Sheet, Point 4.2) and must be distributed without unjustified delay (restrictions may apply to distribution of the initial prefinancing payment; see Data Sheet, Point 4.2).

Payments to this bank account will discharge the granting authority from its payment obligation.

The cost of payment transfers will be borne as follows:

- the granting authority bears the cost of transfers charged by its bank
- the beneficiary bears the cost of transfers charged by its bank
- the party causing a repetition of a transfer bears all costs of the repeated transfer.

Payments by the granting authority will be considered to have been carried out on the date when they are debited to its account.

22.2 Recoveries

Recoveries will be made, if — at beneficiary termination, final payment or afterwards — it turns out that the granting authority has paid too much and needs to recover the amounts undue.

Each beneficiary's financial responsibility in case of recovery is in principle limited to their own debt and undue amounts of their affiliated entities.

In case of enforced recoveries (see Article 22.4), affiliated entities will be held liable for repaying debts of their beneficiaries, if required by the granting authority (see Data Sheet, Point 4.4).

22.3 Amounts due

22.3.1 Prefinancing payments

The aim of the prefinancing is to provide the beneficiaries with a float.

It remains the property of the EU until the final payment.

For **initial prefinancings** (if any), the amount due, schedule and modalities are set out in the Data Sheet (see Point 4.2).

For **additional prefinancings** (if any), the amount due, schedule and modalities are also set out in the Data Sheet (see Point 4.2). However, if the statement on the use of the previous prefinancing payment shows that less than 70% was used, the amount set out in the Data Sheet will be reduced by the difference between the 70% threshold and the amount used.

The contribution to the Mutual Insurance Mechanism will be retained from the prefinancing payments (at the rate and in accordance with the modalities set out in the Data Sheet, see Point 4.2) and transferred to the Mechanism.

Prefinancing payments (or parts of them) may be offset (without the beneficiaries' consent) against amounts owed by a beneficiary to the granting authority — up to the amount due to that beneficiary.

For grants where the granting authority is the European Commission or an EU executive agency, offsetting may also be done against amounts owed to other Commission services or executive agencies.

Payments will not be made if the payment deadline or payments are suspended (see Articles 29 and 30).

22.3.2 Amount due at beneficiary termination — Recovery

In case of beneficiary termination, the granting authority will determine the provisional amount due for the beneficiary concerned.

This will be done on the basis of work packages already completed in previous interim payments. Payments for ongoing/not yet completed work packages which the beneficiary was working on before termination (if any) will therefore be made only later on, with the next interim or final payments when those work packages have been completed.

The **amount due** will be calculated in the following step:

Step 1 — Calculation of the total accepted EU contribution

Step 1 — Calculation of the total accepted EU contribution

The granting authority will first calculate the 'accepted EU contribution' for the beneficiary, on the basis of the beneficiary's lump sum contributions for the work packages which were approved in previous interim payments.

After that, the granting authority will take into account grant reductions (if any). The resulting amount is the 'total accepted EU contribution' for the beneficiary.

The **balance** is then calculated by deducting the payments received (if any; see report on the distribution of payments in Article 32), from the total accepted EU contribution:

{total accepted EU contribution for the beneficiary

minus

{prefinancing and interim payments received (if any)}}.

If the balance is **negative**, it will be **recovered** in accordance with the following procedure:

The granting authority will send a **pre-information letter** to the beneficiary concerned:

- formally notifying the intention to recover, the amount due, the amount to be recovered and the reasons why and
- requesting observations within 30 days of receiving notification.

If no observations are submitted (or the granting authority decides to pursue recovery despite the observations it has received), it will confirm the amount to be recovered and ask this amount to be paid to the coordinator (**confirmation letter**).

If payment is not made to the coordinator by the date specified in the confirmation letter, the granting authority may call on the Mutual Insurance Mechanism to intervene, if continuation of the action is guaranteed and the conditions set out in the rules governing the Mechanism are met.

In this case, it will send a **beneficiary recovery letter**, together with a **debit note** with the terms and date for payment.

The debit note for the beneficiary will include the amount calculated for the affiliated entities which also had to end their participation (if any).

If payment is not made by the date specified in the debit note, the granting authority will **enforce recovery** in accordance with Article 22.4.

22.3.3 Interim payments

Interim payments reimburse the eligible lump sum contributions claimed for work packages implemented during the reporting periods (if any).

Interim payments (if any) will be made in accordance with the schedule and modalities set out the Data Sheet (see Point 4.2).

Payment is subject to the approval of the periodic report and the work packages declared. Their approval does not imply recognition of compliance, authenticity, completeness or correctness of their content.

Incomplete work packages and work packages that have not been delivered or cannot be approved will be rejected (see Article 27).

The **interim payment** will be calculated by the granting authority in the following steps:

Step 1 — Calculation of the total accepted EU contribution

Step 2 — Limit to the interim payment ceiling

Step 1 — Calculation of the total accepted EU contribution

The granting authority will first calculate the 'accepted EU contribution' for the action for the reporting period, by calculating the lump sum contributions for the approved work packages.

After that, the granting authority will take into account grant reductions from beneficiary termination (if any). The resulting amount is the 'total accepted EU contribution'.

Step 2 — Limit to the interim payment ceiling

The resulting amount is then capped to ensure that the total amount of prefinancing and interim payments (if any) does not exceed the interim payment ceiling set out in the Data Sheet (see Point 4.2).

Interim payments (or parts of them) may be offset (without the beneficiaries' consent) against amounts owed by a beneficiary to the granting authority — up to the amount due to that beneficiary.

For grants where the granting authority is the European Commission or an EU executive agency, offsetting may also be done against amounts owed to other Commission services or executive agencies.

Payments will not be made if the payment deadline or payments are suspended (see Articles 29 and 30).

22.3.4 Final payment — Final grant amount — Revenues and Profit — Recovery

The final payment (payment of the balance) reimburses the remaining eligible lump sum contributions claimed for the implemented work packages (if any).

The final payment will be made in accordance with the schedule and modalities set out in the Data Sheet (see Point 4.2).

Payment is subject to the approval of the final periodic report and the work packages declared. Their approval does not imply recognition of compliance, authenticity, completeness or correctness of their content.

Work packages (or parts of them) that have not been delivered or cannot be approved will be rejected (see Article 27).

The **final grant amount for the action** will be calculated in the following steps:

Step 1 — Calculation of the total accepted EU contribution

Step 2 — Limit to the maximum grant amount

Step 3 — Reduction due to the no-profit rule

Step 1 — Calculation of the total accepted EU contribution

The granting authority will first calculate the 'accepted EU contribution' for the action for all reporting periods, by calculating the lump sum contributions for the approved work packages.

After that, the granting authority will take into account grant reductions (if any). The resulting amount is the 'total accepted EU contribution'.

Step 2 — Limit to the maximum grant amount

Not applicable

Step 3 — Reduction due to the no-profit rule

Not applicable

The **balance** (final payment) is then calculated by deducting the total amount of prefinancing and interim payments already made (if any), from the final grant amount:

{final grant amount

minus

{prefinancing and interim payments made (if any)}}.

If the balance is **positive**, it will be **paid** to the coordinator.

The amount retained for the Mutual Insurance Mechanism (see above) will be released and **paid** to the coordinator (in accordance with the rules governing the Mechanism).

The final payment (or part of it) may be offset (without the beneficiaries' consent) against amounts owed by a beneficiary to the granting authority — up to the amount due to that beneficiary.

For grants where the granting authority is the European Commission or an EU executive agency, offsetting may also be done against amounts owed to other Commission services or executive agencies.

Payments will not be made if the payment deadline or payments are suspended (see Articles 29 and 30).

If — despite the release of the Mutual Insurance Mechanism contribution — the balance is **negative**, it will be **recovered** in accordance with the following procedure:

The granting authority will send a **pre-information letter** to the coordinator:

- formally notifying the intention to recover, the final grant amount, the amount to be recovered and the reasons why
- requesting a report on the distribution of payments to the beneficiaries within 30 days of receiving notification and
- requesting observations within 30 days of receiving notification.

If no observations are submitted (or the granting authority decides to pursue recovery despite the observations it has received) and the coordinator has submitted the report on the distribution of payments, it will calculate the **share of the debt per beneficiary**, by:

(a) identifying the beneficiaries for which the amount calculated as follows is negative:

{{{total accepted EU contribution for the beneficiary

divided by

total accepted EU contribution for the action}

multiplied by

final grant amount for the action},

minus

{prefinancing and interim payments received by the beneficiary (if any)}}

and

(b) dividing the debt:

{{amount calculated according to point (a) for the beneficiary concerned

divided by

the sum of the amounts calculated according to point (a) for all the beneficiaries identified according to point (a)}

multiplied by

the amount to be recovered}.

and confirm the amount to be recovered from each beneficiary concerned (**confirmation letter**), together with **debit notes** with the terms and date for payment.

The debit notes for beneficiaries will include the amounts calculated for their affiliated entities (if any).

If the coordinator has not submitted the report on the distribution of payments, the granting authority will **recover** the full amount from the coordinator (**confirmation letter** and **debit note** with the terms and date for payment).

If payment is not made by the date specified in the debit note, the granting authority will **enforce recovery** in accordance with Article 22.4.

22.3.5 Audit implementation after final payment — Revised final grant amount — Recovery

If — after the final payment (in particular, after checks, reviews, audits or investigations; see Article 25) — the granting authority rejects lump sum contributions (see Article 27) or reduces the grant (see Article 28), it will calculate the **revised final grant amount** for the beneficiary concerned.

The **beneficiary revised final grant amount** will be calculated in the following step:

Step 1 — Calculation of the revised total accepted EU contribution

Step 1 — Calculation of the revised total accepted EU contribution

The granting authority will first calculate the ‘revised accepted EU contribution’ for the beneficiary, by calculating the ‘revised accepted contributions’.

After that, it will take into account grant reductions (if any). The resulting 'revised total accepted EU contribution' is the beneficiary revised final grant amount.

If the revised final grant amount is lower than the beneficiary's final grant amount (i.e. its share in the final grant amount for the action), it will be **recovered** in accordance with the following procedure:

The **beneficiary final grant amount** (i.e. share in the final grant amount for the action) is calculated as follows:

{{total accepted EU contribution for the beneficiary

divided by

total accepted EU contribution for the action}

multiplied by

final grant amount for the action}.

The granting authority will send a **pre-information letter** to the beneficiary concerned:

- formally notifying the intention to recover, the amount to be recovered and the reasons why and
- requesting observations within 30 days of receiving notification.

If no observations are submitted (or the granting authority decides to pursue recovery despite the observations it has received), it will confirm the amount to be recovered (**confirmation letter**), together with a **debit note** with the terms and the date for payment.

Recoveries against affiliated entities (if any) will be handled through their beneficiaries.

If payment is not made by the date specified in the debit note, the granting authority will **enforce recovery** in accordance with Article 22.4.

22.4 Enforced recovery

If payment is not made by the date specified in the debit note, the amount due will be recovered:

(a) by offsetting the amount — without the coordinator or beneficiary's consent — against any amounts owed to the coordinator or beneficiary by the granting authority.

In exceptional circumstances, to safeguard the EU financial interests, the amount may be offset before the payment date specified in the debit note.

For grants where the granting authority is the European Commission or an EU executive agency, debts may also be offset against amounts owed by other Commission services or executive agencies.

(b) financial guarantee(s): not applicable

(c) joint and several liability of beneficiaries: not applicable

(d) by holding affiliated entities jointly and severally liable (if any, see Data Sheet, Point 4.4)

(e) by taking legal action (see Article 43) or, provided that the granting authority is the European

Commission or an EU executive agency, by adopting an enforceable decision under Article 299 of the Treaty on the Functioning of the EU (TFEU) and Article 100(2) of EU Financial Regulation 2024/2509.

If the Mutual Insurance Mechanism was called on by the granting authority to intervene, recovery will be continued in the name of the Mutual Insurance Mechanism. If two debit notes were sent, the second one (in the name of the Mutual Insurance Mechanism) will be considered to replace the first one (in the name of the granting authority). Where the MIM intervened, offsetting, enforceable decisions or any other of the above-mentioned forms of enforced recovery may be used mutatis mutandis.

The amount to be recovered will be increased by **late-payment interest** at the rate set out in Article 23.5, from the day following the payment date in the debit note, up to and including the date the full payment is received.

Partial payments will be first credited against expenses, charges and late-payment interest and then against the principal.

Bank charges incurred in the recovery process will be borne by the beneficiary, unless Directive 2015/2366[17] applies.

For grants where the granting authority is an EU executive agency, enforced recovery by offsetting or enforceable decision will be done by the services of the European Commission (see also Article 43).

22.5 Consequences of non-compliance

22.5.1 If the granting authority does not pay within the payment deadlines (see above), the beneficiaries are entitled to **late-payment interest** at the reference rate applied by the European Central Bank (ECB) for its main refinancing operations in euros, plus the percentage specified in the Data Sheet (Point 4.2). The ECB reference rate to be used is the rate in force on the first day of the month in which the payment deadline expires, as published in the C series of the *Official Journal of the European Union*.

If the late-payment interest is lower than or equal to EUR 200, it will be paid to the coordinator only on request submitted within two months of receiving the late payment.

Late-payment interest is not due if all beneficiaries are EU Member States (including regional and local government authorities or other public bodies acting on behalf of a Member State for the purpose of this Agreement).

If payments or the payment deadline are suspended (see Articles 29 and 30), payment will not be considered as late.

Late-payment interest covers the period running from the day following the due date for payment (see above), up to and including the date of payment.

Late-payment interest is not considered for the purposes of calculating the final grant amount.

[17] Directive (EU) 2015/2366 of the European Parliament and of the Council of 25 November 2015 on payment services in the internal market, amending Directives 2002/65/EC, 2009/110/EC and 2013/36/EU and Regulation (EU) No 1093/2010, and repealing Directive 2007/64/EC (OJ L 337, 23.12.2015, p. 35).

22.5.2 If the coordinator breaches any of its obligations under this Article, the grant may be reduced (see Article 28) and the grant or the coordinator may be terminated (see Article 32).

Such breaches may also lead to other measures described in Chapter 5.

ARTICLE 23 — GUARANTEES

Not applicable

ARTICLE 24 — CERTIFICATES

Not applicable

ARTICLE 25 — CHECKS, REVIEWS, AUDITS AND INVESTIGATIONS — EXTENSION OF FINDINGS

25.1 Granting authority checks, reviews and audits

25.1.1 Internal checks

The granting authority may — during the action or afterwards — check the proper implementation of the action and compliance with the obligations under the Agreement, including assessing lump sum contributions, deliverables and reports.

25.1.2 Project reviews

The granting authority may carry out reviews on the proper implementation of the action and compliance with the obligations under the Agreement (general project reviews or specific issues reviews).

Such project reviews may be started during the implementation of the action and until the time-limit set out in the Data Sheet (see Point 6). They will be formally notified to the coordinator or beneficiary concerned and will be considered to start on the date of the notification.

If needed, the granting authority may be assisted by independent, outside experts. If it uses outside experts, the coordinator or beneficiary concerned will be informed and have the right to object on grounds of commercial confidentiality or conflict of interest.

The coordinator or beneficiary concerned must cooperate diligently and provide — within the deadline requested — any information and data in addition to deliverables and reports already submitted. The granting authority may request beneficiaries to provide such information to it directly. Sensitive information and documents will be treated in accordance with Article 13.

The coordinator or beneficiary concerned may be requested to participate in meetings, including with the outside experts.

For **on-the-spot visits**, the beneficiary concerned must allow access to sites and premises (including to the outside experts) and must ensure that information requested is readily available.

Information provided must be accurate, precise and complete and in the format requested, including electronic format.

On the basis of the review findings, a **project review report** will be drawn up.

The granting authority will formally notify the project review report to the coordinator or beneficiary concerned, which has 30 days from receiving notification to make observations.

Project reviews (including project review reports) will be in the language of the Agreement, unless otherwise agreed with the granting authority (see Data Sheet, Point 4.2).

25.1.3 Audits

The granting authority may carry out audits on the proper implementation of the action and compliance with the obligations under the Agreement.

Such audits may be started during the implementation of the action and until the time-limit set out in the Data Sheet (see Point 6). They will be formally notified to the beneficiary concerned and will be considered to start on the date of the notification.

The granting authority may use its own audit service, delegate audits to a centralised service or use external audit firms. If it uses an external firm, the beneficiary concerned will be informed and have the right to object on grounds of commercial confidentiality or conflict of interest.

The beneficiary concerned must cooperate diligently and provide — within the deadline requested — any information (including complete accounts, individual salary statements or other personal data) to verify compliance with the Agreement. Sensitive information and documents will be treated in accordance with Article 13.

For **on-the-spot** visits, the beneficiary concerned must allow access to sites and premises (including for the external audit firm) and must ensure that information requested is readily available.

Information provided must be accurate, precise and complete and in the format requested, including electronic format.

On the basis of the audit findings, a **draft audit report** will be drawn up.

The auditors will formally notify the draft audit report to the beneficiary concerned, which has 30 days from receiving notification to make observations (contradictory audit procedure).

The **final audit report** will take into account observations by the beneficiary concerned and will be formally notified to them.

Audits (including audit reports) will be in the language of the Agreement, unless otherwise agreed with the granting authority (see Data Sheet, Point 4.2).

25.2 European Commission checks, reviews and audits in grants of other granting authorities

Where the granting authority is not the European Commission, the latter has the same rights of checks, reviews and audits as the granting authority.

25.3 Access to records for assessing simplified forms of funding

The beneficiaries must give the European Commission access to their statutory records for the periodic assessment of simplified forms of funding which are used in EU programmes.

25.4 OLAF, EPPO and ECA audits and investigations

The following bodies may also carry out checks, reviews, audits and investigations — during the action or afterwards:

- the European Anti-Fraud Office (OLAF) under Regulations No 883/2013[18] and No 2185/96[19]
- the European Public Prosecutor's Office (EPPO) under Regulation 2017/1939
- the European Court of Auditors (ECA) under Article 287 of the Treaty on the Functioning of the EU (TFEU) and Article 263 of EU Financial Regulation 2024/2509.

If requested by these bodies, the beneficiary concerned must provide full, accurate and complete information in the format requested (including complete accounts, individual salary statements or other personal data, including in electronic format) and allow access to sites and premises for on-the-spot visits or inspections — as provided for under these Regulations.

To this end, the beneficiary concerned must keep all relevant information relating to the action, at least until the time-limit set out in the Data Sheet (Point 6) and, in any case, until any ongoing checks, reviews, audits, investigations, litigation or other pursuits of claims have been concluded.

25.5 Consequences of checks, reviews, audits and investigations — Extension of findings

25.5.1 Consequences of checks, reviews, audits and investigations in this grant

Findings in checks, reviews, audits or investigations carried out in the context of this grant may lead to rejections (see Article 27), grant reduction (see Article 28) or other measures described in Chapter 5.

Rejections or grant reductions after the final payment will lead to a revised final grant amount (see Article 22).

Findings in checks, reviews, audits or investigations during the action implementation may lead to a request for amendment (see Article 39), to change the description of the action set out in Annex 1.

Checks, reviews, audits or investigations that find systemic or recurrent errors, irregularities, fraud or breach of obligations in any EU grant may also lead to consequences in other EU grants awarded under similar conditions ('extension to other grants').

Moreover, findings arising from an OLAF or EPPO investigation may lead to criminal prosecution under national law.

25.5.2 Extension from other grants

[18] Regulation (EU, Euratom) No 883/2013 of the European Parliament and of the Council of 11 September 2013 concerning investigations conducted by the European Anti-Fraud Office (OLAF) and repealing Regulation (EC) No 1073/1999 of the European Parliament and of the Council and Council Regulation (Euratom) No 1074/1999 (OJ L 248, 18/09/2013, p. 1).

[19] Council Regulation (Euratom, EC) No 2185/96 of 11 November 1996 concerning on-the-spot checks and inspections carried out by the Commission in order to protect the European Communities' financial interests against fraud and other irregularities (OJ L 292, 15/11/1996, p. 2).

Findings of checks, reviews, audits or investigations in other grants may be extended to this grant, if:

(a) the beneficiary concerned is found, in other EU grants awarded under similar conditions, to have committed systemic or recurrent errors, irregularities, fraud or breach of obligations that have a material impact on this grant and

(b) those findings are formally notified to the beneficiary concerned — together with the list of grants affected by the findings — within the time-limit for audits set out in the Data Sheet (see Point 6).

The granting authority will formally notify the beneficiary concerned of the intention to extend the findings and the list of grants affected.

If the extension concerns **rejections of lump sum contributions**: the notification will include:

(a) an invitation to submit observations on the list of grants affected by the findings

(b) the request to submit revised financial statements for all grants affected

(c) the correction rate for extrapolation, established on the basis of the systemic or recurrent errors, to calculate the amounts to be rejected, if the beneficiary concerned:

(i) considers that the submission of revised financial statements is not possible or practicable or

(ii) does not submit revised financial statements.

If the extension concerns **grant reductions**: the notification will include:

(a) an invitation to submit observations on the list of grants affected by the findings and

(b) the **correction rate for extrapolation**, established on the basis of the systemic or recurrent errors and the principle of proportionality.

The beneficiary concerned has **60 days** from receiving notification to submit observations, revised financial statements or to propose a duly substantiated **alternative correction method/rate**.

On the basis of this, the granting authority will analyse the impact and decide on the implementation (i.e. start rejection or grant reduction procedures, either on the basis of the revised financial statements or the announced/alternative method/rate or a mix of those; see Articles 27 and 28).

25.6 Consequences of non-compliance

If a beneficiary breaches any of its obligations under this Article, lump sum contributions insufficiently substantiated will be ineligible (see Article 6) and will be rejected (see Article 27), and the grant may be reduced (see Article 28).

Such breaches may also lead to other measures described in Chapter 5.

ARTICLE 26 — IMPACT EVALUATIONS

26.1 Impact evaluation

The granting authority may carry out impact evaluations of the action, measured against the objectives and indicators of the EU programme funding the grant.

Such evaluations may be started during implementation of the action and until the time-limit set out in the Data Sheet (see Point 6). They will be formally notified to the coordinator or beneficiaries and will be considered to start on the date of the notification.

If needed, the granting authority may be assisted by independent outside experts.

The coordinator or beneficiaries must provide any information relevant to evaluate the impact of the action, including information in electronic format.

26.2 Consequences of non-compliance

If a beneficiary breaches any of its obligations under this Article, the granting authority may apply the measures described in Chapter 5.

CHAPTER 5 CONSEQUENCES OF NON-COMPLIANCE

SECTION 1 REJECTIONS AND GRANT REDUCTION

ARTICLE 27 — REJECTION OF CONTRIBUTIONS

27.1 Conditions

The granting authority will — at interim payment, final payment or afterwards — reject any lump sum contributions which are ineligible (see Article 6), in particular following checks, reviews, audits or investigations (see Article 25).

The rejection may also be based on the extension of findings from other grants to this grant (see Article 25).

Ineligible lump sum contributions will be rejected.

27.2 Procedure

If the rejection does not lead to a recovery, the granting authority will formally notify the coordinator or beneficiary concerned of the rejection, the amounts and the reasons why. The coordinator or beneficiary concerned may — within 30 days of receiving notification — submit observations if it disagrees with the rejection (payment review procedure).

If the rejection leads to a recovery, the granting authority will follow the contradictory procedure with pre-information letter set out in Article 22.

27.3 Effects

If the granting authority rejects lump sum contributions, it will deduct them from the lump sum contributions declared and then calculate the amount due (and, if needed, make a recovery; see Article 22).

ARTICLE 28 — GRANT REDUCTION

28.1 Conditions

The granting authority may — at beneficiary termination, final payment or afterwards — reduce the grant for a beneficiary, if:

(a) the beneficiary (or a person having powers of representation, decision-making or control, or person essential for the award/implementation of the grant) has committed:

(i) substantial errors, irregularities or fraud or

(ii) serious breach of obligations under this Agreement or during its award (including improper implementation of the action, non-compliance with the call conditions, submission of false information, failure to provide required information, breach of ethics or security rules (if applicable), failure to cooperate with checks, reviews, audits and investigations, etc.), or

(b) the beneficiary (or a person having powers of representation, decision-making or control, or person essential for the award/implementation of the grant) has committed — in other EU grants awarded to it under similar conditions — systemic or recurrent errors, irregularities, fraud or serious breach of obligations that have a material impact on this grant (extension of findings; see Article 25.5).

The amount of the reduction will be calculated for each beneficiary concerned and proportionate to the seriousness and the duration of the errors, irregularities or fraud or breach of obligations, by applying an individual reduction rate to their accepted EU contribution.

28.2 Procedure

If the grant reduction does not lead to a recovery, the granting authority will formally notify the coordinator or beneficiary concerned of the reduction, the amount to be reduced and the reasons why. The coordinator or beneficiary concerned may — within 30 days of receiving notification — submit observations if it disagrees with the reduction (payment review procedure).

If the grant reduction leads to a recovery, the granting authority will follow the contradictory procedure with pre-information letter set out in Article 22.

28.3 Effects

If the granting authority reduces the grant, it will deduct the reduction and then calculate the amount due (and, if needed, make a recovery; see Article 22).

SECTION 2 SUSPENSION AND TERMINATION

ARTICLE 29 — PAYMENT DEADLINE SUSPENSION

29.1 Conditions

The granting authority may — at any moment — suspend the payment deadline if a payment cannot be processed because:

(a) the required report (see Article 21) has not been submitted or is not complete or additional information is needed

(b) there are doubts about the amount to be paid (e.g. ongoing extension procedure, queries about eligibility, need for a grant reduction, etc.) and additional checks, reviews, audits or investigations are necessary, or

(c) there are other issues affecting the EU financial interests.

29.2 Procedure

The granting authority will formally notify the coordinator of the suspension and the reasons why.

The suspension will **take effect** the day the notification is sent.

If the conditions for suspending the payment deadline are no longer met, the suspension will be **lifted** — and the remaining time to pay (see Data Sheet, Point 4.2) will resume.

If the suspension exceeds two months, the coordinator may request the granting authority to confirm if the suspension will continue.

If the payment deadline has been suspended due to the non-compliance of the report and the revised report is not submitted (or was submitted but is also rejected), the granting authority may also terminate the grant or the participation of the coordinator (see Article 32).

ARTICLE 30 — PAYMENT SUSPENSION

30.1 Conditions

The granting authority may — at any moment — suspend payments, in whole or in part for one or more beneficiaries, if:

(a) a beneficiary (or a person having powers of representation, decision-making or control, or person essential for the award/implementation of the grant) has committed or is suspected of having committed:

(i) substantial errors, irregularities or fraud or

(ii) serious breach of obligations under this Agreement or during its award (including improper implementation of the action, non-compliance with the call conditions, submission of false information, failure to provide required information, breach of ethics or security rules (if applicable), failure to cooperate with checks, reviews, audits and investigations, etc.), or

(b) a beneficiary (or a person having powers of representation, decision-making or control, or person essential for the award/implementation of the grant) has committed — in other EU grants awarded to it under similar conditions — systemic or recurrent errors, irregularities, fraud or serious breach of obligations that have a material impact on this grant (extension of findings; see Article 25.5).

If payments are suspended for one or more beneficiaries, the granting authority will make partial payment(s) for the part(s) not suspended. If suspension concerns the final payment, the payment (or

recovery) of the remaining amount after suspension is lifted will be considered to be the payment that closes the action.

30.2 Procedure

Before suspending payments, the granting authority will send a **pre-information letter** to the beneficiary concerned:

- formally notifying the intention to suspend payments and the reasons why and
- requesting observations within 30 days of receiving notification.

If the granting authority does not receive observations or decides to pursue the procedure despite the observations it has received, it will confirm the suspension (**confirmation letter**). Otherwise, it will formally notify that the procedure is discontinued.

At the end of the suspension procedure, the granting authority will also inform the coordinator.

The suspension will **take effect** the day after the confirmation notification is sent.

If the conditions for resuming payments are met, the suspension will be **lifted**. The granting authority will formally notify the beneficiary concerned (and the coordinator) and set the suspension end date.

During the suspension, no prefinancing will be paid to the beneficiaries concerned. For interim payments, the periodic reports for all reporting periods except the last one (see Article 21) must not contain any financial statements from the beneficiary concerned (or its affiliated entities). The coordinator must include them in the next periodic report after the suspension is lifted or — if suspension is not lifted before the end of the action — in the last periodic report.

ARTICLE 31 — GRANT AGREEMENT SUSPENSION

31.1 Consortium-requested GA suspension

31.1.1 Conditions and procedure

The beneficiaries may request the suspension of the grant or any part of it, if exceptional circumstances — in particular *force majeure* (see Article 35) — make implementation impossible or excessively difficult.

The coordinator must submit a request for **amendment** (see Article 39), with:

- the reasons why
- the date the suspension takes effect; this date may be before the date of the submission of the amendment request and
- the expected date of resumption.

The suspension will **take effect** on the day specified in the amendment.

Once circumstances allow for implementation to resume, the coordinator must immediately request another **amendment** of the Agreement to set the suspension end date, the resumption date (one day

after suspension end date), extend the duration and make other changes necessary to adapt the action to the new situation (see Article 39) — unless the grant has been terminated (see Article 32). The suspension will be **lifted** with effect from the suspension end date set out in the amendment. This date may be before the date of the submission of the amendment request.

During the suspension, no prefinancing will be paid. Moreover, no work may be done. Ongoing work packages must be interrupted and no new work packages may be started.

31.2 EU-initiated GA suspension

31.2.1 Conditions

The granting authority may suspend the grant or any part of it, if:

(a) a beneficiary (or a person having powers of representation, decision-making or control, or person essential for the award/implementation of the grant) has committed or is suspected of having committed:

  (i) substantial errors, irregularities or fraud or

  (ii) serious breach of obligations under this Agreement or during its award (including improper implementation of the action, non-compliance with the call conditions, submission of false information, failure to provide required information, breach of ethics or security rules (if applicable), failure to cooperate with checks, reviews, audits and investigations, etc.), or

(b) a beneficiary (or a person having powers of representation, decision-making or control, or person essential for the award/implementation of the grant) has committed — in other EU grants awarded to it under similar conditions — systemic or recurrent errors, irregularities, fraud or serious breach of obligations that have a material impact on this grant (extension of findings; see Article 25.5)

(c) other:

  (i) linked action issues: not applicable

  (ii) the action has lost its scientific or technological relevance, for EIC Accelerator actions: the action has lost its economic relevance, for challenge-based EIC Pathfinder actions and Horizon Europe Missions: the action has lost its relevance as part of the Portfolio for which it has been initially selected

31.2.2 Procedure

Before suspending the grant, the granting authority will send a **pre-information letter** to the coordinator:

- formally notifying the intention to suspend the grant and the reasons why and
- requesting observations within 30 days of receiving notification.

If the granting authority does not receive observations or decides to pursue the procedure despite the

observations it has received, it will confirm the suspension (**confirmation letter**). Otherwise, it will formally notify that the procedure is discontinued.

The suspension will **take effect** the day after the confirmation notification is sent (or on a later date specified in the notification).

Once the conditions for resuming implementation of the action are met, the granting authority will formally notify the coordinator a **lifting of suspension letter**, in which it will set the suspension end date and invite the coordinator to request an amendment of the Agreement to set the resumption date (one day after suspension end date), extend the duration and make other changes necessary to adapt the action to the new situation (see Article 39) — unless the grant has been terminated (see Article 32). The suspension will be **lifted** with effect from the suspension end date set out in the lifting of suspension letter. This date may be before the date on which the letter is sent.

During the suspension, no prefinancing will be paid. Moreover, no work may be done. Ongoing work packages must be interrupted and no new work packages may be started.

The beneficiaries may not claim damages due to suspension by the granting authority (see Article 33).

Grant suspension does not affect the granting authority's right to terminate the grant or a beneficiary (see Article 32) or reduce the grant (see Article 28).

ARTICLE 32 — GRANT AGREEMENT OR BENEFICIARY TERMINATION

32.1 Consortium-requested GA termination

32.1.1 Conditions and procedure

The beneficiaries may request the termination of the grant.

The coordinator must submit a request for **amendment** (see Article 39), with:

- the reasons why
- the date the consortium ends work on the action ('end of work date') and
- the date the termination takes effect ('termination date'); this date must be after the date of the submission of the amendment request.

The termination will **take effect** on the termination date specified in the amendment.

If no reasons are given or if the granting authority considers the reasons do not justify termination, it may consider the grant terminated improperly.

32.1.2 Effects

The coordinator must — within 60 days from when termination takes effect — submit a **periodic report** (for the open reporting period until termination).

The granting authority will calculate the final grant amount and final payment on the basis of the report submitted and taking into account the lump sum contributions for activities implemented before

the end of work date (see Article 22). Partial lump sum contributions for work packages that were not completed (e.g. due to technical reasons) may exceptionally be taken into account.

If the granting authority does not receive the report within the deadline, only lump sum contributions which are included in an approved periodic report will be taken into account (no contributions if no periodic report was ever approved).

Improper termination may lead to a grant reduction (see Article 28).

After termination, the beneficiaries' obligations (in particular Articles 13 (confidentiality and security), 16 (IPR), 17 (communication, dissemination and visibility), 21 (reporting), 25 (checks, reviews, audits and investigations), 26 (impact evaluation), 27 (rejections), 28 (grant reduction) and 42 (assignment of claims)) continue to apply.

32.2 Consortium-requested beneficiary termination

32.2.1 Conditions and procedure

The coordinator may request the termination of the participation of one or more beneficiaries, on request of the beneficiary concerned or on behalf of the other beneficiaries.

The coordinator must submit a request for **amendment** (see Article 39), with:

- the reasons why
- the opinion of the beneficiary concerned (or proof that this opinion has been requested in writing)
- the date the beneficiary ends work on the action ('end of work date')
- the date the termination takes effect ('termination date'); this date must be after the date of the submission of the amendment request.

If the termination concerns the coordinator and is done without its agreement, the amendment request must be submitted by another beneficiary (acting on behalf of the consortium).

The termination will **take effect** on the termination date specified in the amendment.

If no information is given or if the granting authority considers that the reasons do not justify termination, it may consider the beneficiary to have been terminated improperly.

32.2.2 Effects

The coordinator must — within 60 days from when termination takes effect — submit:

(i) a **report on the distribution of payments** to the beneficiary concerned

(ii) a **termination report** from the beneficiary concerned, for the open reporting period until termination, containing an overview of the progress of the work

(iii) a second **request for amendment** (see Article 39) with other amendments needed (e.g. reallocation of the tasks and the estimated budget of the terminated beneficiary; addition of a new beneficiary to replace the terminated beneficiary; change of coordinator, etc.).

The granting authority will calculate the amount due to the beneficiary on the basis of the reports submitted in previous interim payments (i.e. beneficiary's lump sum contributions for completed and approved work packages).

Lump sum contributions for ongoing/not yet completed work packages will have to be included in the periodic report for the next reporting periods when those work packages have been completed.

If the granting authority does not receive the report on the distribution of payments within the deadline, it will consider that:

- the coordinator did not distribute any payment to the beneficiary concerned and that
- the beneficiary concerned must not repay any amount to the coordinator.

If the second request for amendment is accepted by the granting authority, the Agreement is **amended** to introduce the necessary changes (see Article 39).

If the second request for amendment is rejected by the granting authority (because it calls into question the decision awarding the grant or breaches the principle of equal treatment of applicants), the grant may be terminated (see Article 32).

Improper termination may lead to a reduction of the grant (see Article 31) or grant termination (see Article 32).

After termination, the concerned beneficiary's obligations (in particular Articles 13 (confidentiality and security), 16 (IPR), 17 (communication, dissemination and visibility), 21 (reporting), 25 (checks, reviews, audits and investigations), 26 (impact evaluation), 27 (rejections), 28 (grant reduction) and 42 (assignment of claims)) continue to apply.

32.3 EU-initiated GA or beneficiary termination

32.3.1 Conditions

The granting authority may terminate the grant or the participation of one or more beneficiaries, if:

(a) one or more beneficiaries do not accede to the Agreement (see Article 40)

(b) a change to the action or the legal, financial, technical, organisational or ownership situation of a beneficiary is likely to substantially affect the implementation of the action or calls into question the decision to award the grant (including changes linked to one of the exclusion grounds listed in the declaration of honour)

(c) following termination of one or more beneficiaries, the necessary changes to the Agreement (and their impact on the action) would call into question the decision awarding the grant or breach the principle of equal treatment of applicants

(d) implementation of the action has become impossible or the changes necessary for its continuation would call into question the decision awarding the grant or breach the principle of equal treatment of applicants

(e) a beneficiary (or person with unlimited liability for its debts) is subject to bankruptcy

proceedings or similar (including insolvency, winding-up, administration by a liquidator or court, arrangement with creditors, suspension of business activities, etc.)

(f) a beneficiary (or person with unlimited liability for its debts) is in breach of social security or tax obligations

(g) a beneficiary (or person having powers of representation, decision-making or control, or person essential for the award/implementation of the grant) has been found guilty of grave professional misconduct

(h) a beneficiary (or person having powers of representation, decision-making or control, or person essential for the award/implementation of the grant) has committed fraud, corruption, or is involved in a criminal organisation, money laundering, terrorism-related crimes (including terrorism financing), child labour or human trafficking

(i) a beneficiary (or person having powers of representation, decision-making or control, or person essential for the award/implementation of the grant) was created under a different jurisdiction with the intent to circumvent fiscal, social or other legal obligations in the country of origin (or created another entity with this purpose)

(j) a beneficiary (or person having powers of representation, decision-making or control, or person essential for the award/implementation of the grant) has committed:

  (i) substantial errors, irregularities or fraud or

  (ii) serious breach of obligations under this Agreement or during its award (including improper implementation of the action, non-compliance with the call conditions, submission of false information, failure to provide required information, breach of ethics or security rules (if applicable), failure to cooperate with checks, reviews, audits and investigations, etc.)

(k) a beneficiary (or person having powers of representation, decision-making or control, or person essential for the award/implementation of the grant) has committed — in other EU grants awarded to it under similar conditions — systemic or recurrent errors, irregularities, fraud or serious breach of obligations that have a material impact on this grant (extension of findings; see Article 25.5)

(l) despite a specific request by the granting authority, a beneficiary does not request — through the coordinator — an amendment to the Agreement to end the participation of one of its affiliated entities or associated partners that is in one of the situations under points (d), (f), (e), (g), (h), (i) or (j) and to reallocate its tasks, or

(m) other:

  (i) linked action issues: not applicable

  (ii) the action has lost its scientific or technological relevance, for EIC Accelerator actions: the action has lost its economic relevance, for challenge-based EIC Pathfinder actions and Horizon Europe Missions: the action has lost its relevance as part of the Portfolio for which it has been initially selected

32.3.2 Procedure

Before terminating the grant or participation of one or more beneficiaries, the granting authority will send **a pre-information letter** to the coordinator or beneficiary concerned:

- formally notifying the intention to terminate and the reasons why and
- requesting observations within 30 days of receiving notification.

If the granting authority does not receive observations or decides to pursue the procedure despite the observations it has received, it will confirm the termination and the date it will take effect (**confirmation letter**). Otherwise, it will formally notify that the procedure is discontinued.

For beneficiary terminations, the granting authority will — at the end of the procedure — also inform the coordinator.

The termination will **take effect** the day after the confirmation notification is sent (or on a later date specified in the notification; 'termination date').

32.3.3 Effects

(a) for **GA termination**:

The coordinator must — within 60 days from when termination takes effect — submit a **periodic report** (for the last open reporting period until termination).

The granting authority will calculate the final grant amount and final payment on the basis of the report submitted and taking into account the lump sum contributions for activities implemented before termination takes effect (see Article 22). Partial lump sum contributions for work packages that were not completed (e.g. due to technical reasons) may exceptionally be taken into account.

If the grant is terminated for breach of the obligation to submit reports, the coordinator may not submit any report after termination.

If the granting authority does not receive the report within the deadline, only lump sum contributions which are included in an approved periodic report will be taken into account (no contributions if no periodic report was ever approved).

Termination does not affect the granting authority's right to reduce the grant (see Article 28) or to impose administrative sanctions (see Article 34).

The beneficiaries may not claim damages due to termination by the granting authority (see Article 33).

After termination, the beneficiaries' obligations (in particular Articles 13 (confidentiality and security), 16 (IPR), 17 (communication, dissemination and visibility), 21 (reporting), 25 (checks, reviews, audits and investigations), 26 (impact evaluation), 27 (rejections), 28 (grant reduction) and 42 (assignment of claims)) continue to apply.

(b) for **beneficiary termination**:

The coordinator must — within 60 days from when termination takes effect — submit:

(i) a **report on the distribution of payments** to the beneficiary concerned

(ii) a **termination report** from the beneficiary concerned, for the open reporting period until termination, containing an overview of the progress of the work

(iii) a **request for amendment** (see Article 39) with any amendments needed (e.g. reallocation of the tasks and the estimated budget of the terminated beneficiary; addition of a new beneficiary to replace the terminated beneficiary; change of coordinator, etc.).

The granting authority will calculate the amount due to the beneficiary on the basis of the reports submitted in previous interim payments (i.e. beneficiary's lump sum contributions for completed and approved work packages).

Lump sum contributions for ongoing/not yet completed work packages will have to be included in the periodic report for the next reporting periods when those work packages have been completed.

If the granting authority does not receive the report on the distribution of payments within the deadline, it will consider that:

- the coordinator did not distribute any payment to the beneficiary concerned and that
- the beneficiary concerned must not repay any amount to the coordinator.

If the request for amendment is accepted by the granting authority, the Agreement is **amended** to introduce the necessary changes (see Article 39).

If the request for amendment is rejected by the granting authority (because it calls into question the decision awarding the grant or breaches the principle of equal treatment of applicants), the grant may be terminated (see Article 32).

After termination, the concerned beneficiary's obligations (in particular Articles 13 (confidentiality and security), 16 (IPR), 17 (communication, dissemination and visibility), 21 (reporting), 25 (checks, reviews, audits and investigations), 26 (impact evaluation), 27 (rejections), 28 (grant reduction) and 42 (assignment of claims)) continue to apply.

SECTION 3 OTHER CONSEQUENCES: DAMAGES AND ADMINISTRATIVE SANCTIONS

ARTICLE 33 — DAMAGES

33.1 Liability of the granting authority

The granting authority cannot be held liable for any damage caused to the beneficiaries or to third parties as a consequence of the implementation of the Agreement, including for gross negligence.

The granting authority cannot be held liable for any damage caused by any of the beneficiaries or other participants involved in the action, as a consequence of the implementation of the Agreement.

33.2 Liability of the beneficiaries

The beneficiaries must compensate the granting authority for any damage it sustains as a result of the implementation of the action or because the action was not implemented in full compliance with the Agreement, provided that it was caused by gross negligence or wilful act.

The liability does not extend to indirect or consequential losses or similar damage (such as loss of profit, loss of revenue or loss of contracts), provided such damage was not caused by wilful act or by a breach of confidentiality.

ARTICLE 34 — ADMINISTRATIVE SANCTIONS AND OTHER MEASURES

Nothing in this Agreement may be construed as preventing the adoption of administrative sanctions (i.e. exclusion from EU award procedures and/or financial penalties) or other public law measures, in addition or as an alternative to the contractual measures provided under this Agreement (see, for instance, Articles 137 to 148 EU Financial Regulation 2024/2509 and Articles 4 and 7 of Regulation 2988/95[20]).

SECTION 4 FORCE MAJEURE

ARTICLE 35 — FORCE MAJEURE

A party prevented by force majeure from fulfilling its obligations under the Agreement cannot be considered in breach of them.

'Force majeure' means any situation or event that:

- prevents either party from fulfilling their obligations under the Agreement
- was unforeseeable, exceptional situation and beyond the parties' control
- was not due to error or negligence on their part (or on the part of other participants involved in the action) and
- proves to be inevitable in spite of exercising all due diligence.

Any situation constituting force majeure must be formally notified to the other party without delay, stating the nature, likely duration and foreseeable effects.

The parties must immediately take all the necessary steps to limit any damage due to force majeure and do their best to resume implementation of the action as soon as possible.

CHAPTER 6 FINAL PROVISIONS

ARTICLE 36 — COMMUNICATION BETWEEN THE PARTIES

36.1 Forms and means of communication — Electronic management

EU grants are managed fully electronically through the EU Funding & Tenders Portal ('Portal').

[20] Council Regulation (EC, Euratom) No 2988/95 of 18 December 1995 on the protection of the European Communities financial interests (OJ L 312, 23.12.1995, p. 1).

All communications must be made electronically through the Portal in accordance with the Portal Terms and Conditions and using the forms and templates provided there (except if explicitly instructed otherwise by the granting authority).

Communications must be made in writing and clearly identify the grant agreement (project number and acronym).

Communications must be made by persons authorised according to the Portal Terms and Conditions. For naming the authorised persons, each beneficiary must have designated — before the signature of this Agreement — a 'legal entity appointed representative (LEAR)'. The role and tasks of the LEAR are stipulated in their appointment letter (see Portal Terms and Conditions).

If the electronic exchange system is temporarily unavailable, instructions will be given on the Portal.

36.2 Date of communication

The sending date for communications made through the Portal will be the date and time of sending, as indicated by the time logs.

The receiving date for communications made through the Portal will be the date and time the communication is accessed, as indicated by the time logs. Formal notifications that have not been accessed within 10 days after sending, will be considered to have been accessed (see Portal Terms and Conditions).

If a communication is exceptionally made on paper (by e-mail or postal service), general principles apply (i.e. date of sending/receipt). Formal notifications by registered post with proof of delivery will be considered to have been received either on the delivery date registered by the postal service or the deadline for collection at the post office.

If the electronic exchange system is temporarily unavailable, the sending party cannot be considered in breach of its obligation to send a communication within a specified deadline.

36.3 Addresses for communication

The Portal can be accessed via the Europa website.

The address for paper communications to the granting authority (if exceptionally allowed) is the official mailing address indicated on its website.

For beneficiaries, it is the legal address specified in the Portal Participant Register.

ARTICLE 37 — INTERPRETATION OF THE AGREEMENT

The provisions in the Data Sheet take precedence over the rest of the Terms and Conditions of the Agreement.

Annex 5 takes precedence over the Terms and Conditions.

The Terms and Conditions take precedence over the Annexes other than Annex 5.

Annex 2 takes precedence over Annex 1.

ARTICLE 38 — CALCULATION OF PERIODS AND DEADLINES

In accordance with Regulation No 1182/71[21], periods expressed in days, months or years are calculated from the moment the triggering event occurs.

The day during which that event occurs is not considered as falling within the period.

'Days' means calendar days, not working days.

ARTICLE 39 — AMENDMENTS

39.1 Conditions

The Agreement may be amended, unless the amendment entails changes to the Agreement which would call into question the decision awarding the grant or breach the principle of equal treatment of applicants.

Amendments may be requested by any of the parties.

39.2 Procedure

The party requesting an amendment must submit a request for amendment signed directly in the Portal Amendment tool.

The coordinator submits and receives requests for amendment on behalf of the beneficiaries (see Annex 3). If a change of coordinator is requested without its agreement, the submission must be done by another beneficiary (acting on behalf of the other beneficiaries).

The request for amendment must include:

- the reasons why
- the appropriate supporting documents and
- for a change of coordinator without its agreement: the opinion of the coordinator (or proof that this opinion has been requested in writing).

The granting authority may request additional information.

If the party receiving the request agrees, it must sign the amendment in the tool within 45 days of receiving notification (or any additional information the granting authority has requested). If it does not agree, it must formally notify its disagreement within the same deadline. The deadline may be extended, if necessary for the assessment of the request. If no notification is received within the deadline, the request is considered to have been rejected.

An amendment **enters into force** on the day of the signature of the receiving party.

An amendment **takes effect** on the date of entry into force or other date specified in the amendment.

[21] Regulation (EEC, Euratom) No 1182/71 of the Council of 3 June 1971 determining the rules applicable to periods, dates and time-limits (OJ L 124, 8/6/1971, p. 1).

ARTICLE 40 — ACCESSION AND ADDITION OF NEW BENEFICIARIES

40.1 Accession of the beneficiaries mentioned in the Preamble

The beneficiaries which are not coordinator must accede to the grant by signing the accession form (see Annex 3) directly in the Portal Grant Preparation tool, within 30 days after the entry into force of the Agreement (see Article 44).

They will assume the rights and obligations under the Agreement with effect from the date of its entry into force (see Article 44).

If a beneficiary does not accede to the grant within the above deadline, the coordinator must — within 30 days — request an amendment (see Article 39) to terminate the beneficiary and make any changes necessary to ensure proper implementation of the action. This does not affect the granting authority's right to terminate the grant (see Article 32).

40.2 Addition of new beneficiaries

In justified cases, the beneficiaries may request the addition of a new beneficiary.

For this purpose, the coordinator must submit a request for amendment in accordance with Article 39. It must include an accession form (see Annex 3) signed by the new beneficiary directly in the Portal Amendment tool.

New beneficiaries will assume the rights and obligations under the Agreement with effect from the date of their accession specified in the accession form (see Annex 3).

Additions are also possible in mono-beneficiary grants.

ARTICLE 41 — TRANSFER OF THE AGREEMENT

In justified cases, the beneficiary of a mono-beneficiary grant may request the transfer of the grant to a new beneficiary, provided that this would not call into question the decision awarding the grant or breach the principle of equal treatment of applicants.

The beneficiary must submit a request for **amendment** (see Article 39), with

- the reasons why
- the accession form (see Annex 3) signed by the new beneficiary directly in the Portal Amendment tool and
- additional supporting documents (if required by the granting authority).

The new beneficiary will assume the rights and obligations under the Agreement with effect from the date of accession specified in the accession form (see Annex 3).

ARTICLE 42 — ASSIGNMENTS OF CLAIMS FOR PAYMENT AGAINST THE GRANTING AUTHORITY

The beneficiaries may not assign any of their claims for payment against the granting authority to

any third party, except if expressly approved in writing by the granting authority on the basis of a reasoned, written request by the coordinator (on behalf of the beneficiary concerned).

If the granting authority has not accepted the assignment or if the terms of it are not observed, the assignment will have no effect on it.

In no circumstances will an assignment release the beneficiaries from their obligations towards the granting authority.

ARTICLE 43 — APPLICABLE LAW AND SETTLEMENT OF DISPUTES

43.1 Applicable law

The Agreement is governed by the applicable EU law, supplemented if necessary by the law of Belgium.

Special rules may apply for beneficiaries which are international organisations (if any; see Data Sheet, Point 5).

43.2 Dispute settlement

If a dispute concerns the interpretation, application or validity of the Agreement, the parties must bring action before the EU General Court — or, on appeal, the EU Court of Justice — under Article 272 of the Treaty on the Functioning of the EU (TFEU).

For non-EU beneficiaries (if any), such disputes must be brought before the courts of Brussels, Belgium — unless an international agreement provides for the enforceability of EU court judgements.

For beneficiaries with arbitration as special dispute settlement forum (if any; see Data Sheet, Point 5), the dispute will — in the absence of an amicable settlement — be settled in accordance with the Rules for Arbitration published on the Portal.

If a dispute concerns administrative sanctions, offsetting or an enforceable decision under Article 299 TFEU (see Articles 22 and 34), the beneficiaries must bring action before the General Court — or, on appeal, the Court of Justice — under Article 263 TFEU.

For grants where the granting authority is an EU executive agency (see Preamble), actions against offsetting and enforceable decisions must be brought against the European Commission (not against the granting authority; see also Article 22).

ARTICLE 44 — ENTRY INTO FORCE

The Agreement will enter into force on the day of signature by the granting authority or the coordinator, depending on which is later.

SIGNATURES

For the coordinator

Marc Dufourmantelle with ECAS id n00ll0rx signed in the Participant Portal on 13/05/2026 at 10:41:17 (transaction id SigId-13385-phY4D1efIND5o0brcaZTtZDAnDqrizdGoFeAzWUtsx83JjckTuV2zNiSUf1fzPCt8Al6yzuv2UXrg5FT8StWVOf-R2zIpfT8xjMVQv7ei6TcSG-jPwNdh4bhwzHS8Z1RDjURciCtUW2o9axTIE5fvhRYG51v5NG4czTF32WSn3Dd8B1Sxll33ilt0twN5rhzQHXXRW). Timestamp by third party at 2026.05.13 10:41:23 CEST

For the granting authority

Signed by Andreas BOSCHEN with ECAS id iboscand as an authorised representative on 13-05-2026 12:40:53 (transaction id SigId-14490-g9KRg1unaTRstkOAtwvnG36UA5ubWzwvU48rQ1IUqdeuSyjbOKvkXvszrTZfaswRkzkQzZJFOeT08Y1E8f2OkzN-R2zIpfT8xjMVQv7ei6TcSG-9MQBbWRAs5tpMnMSvznlldvdnb2IFNqnWkO3IRO8AOgs6McOTaIMgW6BisX1cQLR1RQWzUAdExM82tWYTtnfa0)
2026.05.13 12:41:04 CEST

ANNEX 1

Horizon Europe (HORIZON)

Description of the action (DoA)

Part A

Part B

DESCRIPTION OF THE ACTION (PART A)

COVER PAGE

Part A of the Description of the Action (DoA) must be completed directly on the Portal Grant Preparation screens.

PROJECT *Grant Preparation (General Information screen) — Enter the info.*	
Project number:	101286541
Project name:	Highly Automated and Virtualised ATS Platform for EN-route and TMA Operations
Project acronym:	HAVEN
Call:	HORIZON-SESAR-2025-DES-IR-02
Topic:	HORIZON-SESAR-2025-DES-IR-02-WA3-1
Type of action:	HORIZON-JU-RIA
Service:	SESAR
Project starting date:	fixed date: 1 September 2026
Project duration:	36 months

TABLE OF CONTENTS

PROJECT SUMMARY

Project summary

Grant Preparation (General Information screen) — Provide an overall description of your project (including context and overall objectives, planned activities and main achievements, and expected results and impacts (on target groups, change procedures, capacities, innovation etc)). This summary should give readers a clear idea of what your project is about.

Use the project summary from your proposal.

The HAVEN project aims to demonstrate the next generation of Air Traffic Services (ATS) platform for EN-ROUTE and Terminal Manoeuvring Area (TMA) operations. It involves key industry partners and major European Air Navigation Service Providers (ANSPs), addressing several topics including Artificial Intelligence, open architecture, flexible deployment, and Air Traffic Management (ATM) in the cloud. The project supports concepts like trajectory-based operations, demand capacity balancing, and environmentally friendly operations. It will also consider safety, cyber-security, standardisation, and certification with EASA support.

The project is organized into two technological solutions:
TS-1 “ATS platform support to advanced operational concepts in EN-ROUTE and TMA” focuses on supporting the operational concepts defined for EN-ROUTE and TMA.
These will be defined in other WAs of the SESAR3 IR2 call, such as TBO, DCB, Civil/Military coordination etc. This solution will cover the way that the platform supports these different concepts and they will be prototyped and validated through real time simulations, with human in the loop (with ATC controllers involved).
TS-2 “Next generation architecture and deployment architecture for ATS platform” is more technical and linked to the architecture, infrastructure and deployment patterns and intends to cover the impacts of the new service delivery model in the architecture.
Transition aspects, as per the new service delivery model recommendation task force, will be studied to clarify how these services can be packaged to allow a smooth transition.
Moreover, third parties services interchangability will be validated through a cross-project experimentation, and the benefit from the Cloud-ready platform, going one step further to implement different ways of deployment, taking advantage of the flexibility it offers, will be demonstrated.

LIST OF PARTICIPANTS

PARTICIPANTS

Grant Preparation (Beneficiaries screen) — Enter the info.

Number	Role	Short name	Legal name	Country	PIC
1	COO	THALES LAS	THALES LAS FRANCE SAS	FR	999961555
2	BEN	THALES AVS	THALES AVS FRANCE SAS	FR	999984447
3	BEN	DSNA	DIRECTION DES SERVICES DE LA NAVIGATION AERIENNE	FR	928673636
4	BEN	LFV	LUFTFARTSVERKET	SE	942346077
5	BEN	NAVIAIR	NAVIAIR	DK	923671249
6	BEN	ACG	AUSTRO CONTROL OSTERREICHISCHE GESELLSCHAFT FUR ZIVILLUFTFAHRT MBH	AT	998956635
7	BEN	AIRNAV IRELAND	THE IRISH AIR NAVIGATION SERVICE	IE	881850281
8	BEN	CCL	HRVATSKA KONTROLA ZRACNE PLOVIDBE DOO	HR	924128216

PARTICIPANTS

Grant Preparation (Beneficiaries screen) — Enter the info.

Number	Role	Short name	Legal name	Country	PIC
9	BEN	NAV PORTUGAL	NAVEGACAO AEREA DE PORTUGAL - NAV PORTUGAL EPE	PT	955596471
10	BEN	HC	HUNGAROCONTROL MAGYAR LEGIFORGALMISZOLGALAT ZARTKORUEN MUKODO RESZVENYTARSASAG	HU	941767472
11	BEN	SSG	SOPRA STERIA GROUP	FR	951375807
12	BEN	SITTI	S.I.T.T.I. SPECIALE IMPIANTI TELESCRIVENTI TELEFONICI INTERNI SPA	IT	890100228
13	BEN	ENAC	ECOLE NATIONALE DE L AVIATION CIVILE	FR	996375756
14	BEN	THALES CORTAIX	THALES	FR	999751938

LIST OF WORK PACKAGES

Work packages

Grant Preparation (Work Packages screen) — Enter the info.

Work Package No	Work Package name	Lead Beneficiary	Effort (Person-Months)	Start Month	End Month	Deliverables
WP1	Project Management & Coordination - first period	1 - THALES LAS	70.88	1	18	D1.1 – Project Management Plan (PMP) - initial D1.2 – Communication, Dissemination and Exploitation Plan (CDE) - initial D1.3 – Data Management Plan (DMP) - initial D1.4 – Management Progress Report 2026 D1.5 – Communication, Dissemination and Exploitation Plan (CDE) - Update
WP2	Support to advanced operational concepts - first period	1 - THALES LAS	544.99	1	18	D2.1 – Technical specifications/interface requirements TS/IRS ATM Solution 1 - initial D2.2 – Technological validation plan TVALP ATM Solution 1 - initial D2.3 – Technological validation report TVALR ATM Solution 1 - initial D2.4 – Cost-Benefit Analysis - Technological CBAT ATM Solution 1 - initial D2.5 – Standardisation STAND ATM Solution 1 - initial D2.6 – REG ATM Solution 1 - initial D2.7 – REG ATM Solution 1 - update D2.8 – Solution 1 Slides - PRM1
WP3	Next generation ATS platform architecture & deployment - first period	1 - THALES LAS	781.18	1	18	D3.1 – Technical specifications/interface requirements TS/IRS ATM Solution 2 - initial

Work packages

Grant Preparation (Work Packages screen) — Enter the info.

Work Package No	Work Package name	Lead Beneficiary	Effort (Person-Months)	Start Month	End Month	Deliverables
						D3.2 – Technological validation plan TVALP ATM Solution 2 - initial D3.3 – Technological validation report TVALR ATM Solution 2 - initial D3.4 – Cost-Benefit Analysis - Technological CBAT ATM Solution 2 - initial D3.5 – Standardisation STAND ATM Solution 2 - initial D3.6 – REG ATM Solution 2 - initial D3.7 – Standardisation STAND ATM Solution 2 - update D3.8 – REG ATM Solution 2 - update D3.9 – Solution 2 Slides - PRM1
WP4	Project Management & Coordination - second period	1 - THALES LAS	91.55	19	36	D4.1 – Project Management Plan (PMP) - final D4.2 – Communication, Dissemination and Exploitation Plan (CDE) - final D4.3 – Data Management Plan (DMP) - final D4.4 – Management Progress Report 2027 D4.5 – Management Progress Report 2028 D4.6 – Project Closure Report D4.7 – Communication, Dissemination and Exploitation Plan (CDE) - second update
WP5	Support to advanced operational concepts - second period	1 - THALES LAS	407.70	19	36	D5.1 – Contextual note ATM Solution 1 – final D5.2 – Technical specifications/interface requirements TS/IRS ATM Solution 1 - intermediate

Work packages

Grant Preparation (Work Packages screen) — Enter the info.

Work Package No	Work Package name	Lead Beneficiary	Effort (Person-Months)	Start Month	End Month	Deliverables
						D5.3 – Technological validation plan TVALP ATM Solution 1 - final D5.4 – Technological validation report TVALR ATM Solution 1 - final D5.5 – Cost-Benefit Analysis - Technological CBAT ATM Solution 1 - final D5.6 – Standardisation STAND ATM Solution 1 - intermediate D5.7 – Contextual note ATM Solution 1 – initial D5.8 – Technical specifications/interface requirements TS/IRS ATM Solution 1 - final Update D5.9 – Standardisation STAND ATM Solution 1 - final update D5.10 – REG ATM Solution 1 - final update D5.11 – REG ATM Solution 1 - intermediate D5.12 – Solution 1 Slides - PRM2 D5.13 – Solution 1 Slides - MG
WP6	Next generation ATS platform architecture & deployment - second period	1 - THALES LAS	958.77	19	36	D6.1 – Contextual note ATM Solution 2 - final D6.2 – Technical specifications/interface requirements TS/IRS ATM Solution 2 - intermediate D6.3 – Technological validation plan TVALP ATM Solution 2 - final D6.4 – Technological validation report TVALR ATM Solution 2 - final

Work packages

Grant Preparation (Work Packages screen) — Enter the info.

Work Package No	Work Package name	Lead Beneficiary	Effort (Person-Months)	Start Month	End Month	Deliverables
						D6.5 – Cost-Benefit Analysis - Technological CBAT ATM Solution 2 - final D6.6 – Standardisation STAND ATM Solution 2 - intermediate D6.7 – REG ATM Solution 2 - intermediate D6.8 – Contextual note ATM Solution 2 - initial D6.9 – Technical specifications/interface requirements TS/IRS ATM Solution 2 - final Update D6.10 – Standardisation STAND ATM Solution 2 - final update D6.11 – REG ATM Solution 2 - final update D6.12 – Solution 2 Slides - PRM2 D6.13 – Solution 2 Slides - MG

Work package WP1 – Project Management & Coordination - first period

Work Package Number	WP1	Lead Beneficiary	1 - THALES LAS
Work Package Name	Project Management & Coordination - first period		
Start Month	1	End Month	18

Objectives
The primary objective of this work package is to implement project management best practices to ensure the timely and budget-compliant delivery of the HAVEN SESAR Solutions, as outlined in the grant agreement and SESAR3JU Project Handbook. Additionally, it aims to engage with relevant stakeholders as per the communications and dissemination plan. The WP main objectives are: Project Monitoring Coordinate and oversee the project's progress, ensuring adherence to the time schedule, cost, and milestones. Management Handle legal, contractual, quality, financial, and data management aspects, and report to the SESAR Joint Undertaking (SJU). Deliverables Ensure the timely delivery and quality of all project deliverables. Stakeholder Engagement: Reach out to target groups that may affect or be affected by the solution outcomes, as defined in the communications and dissemination plan. Compliance Ensure the project is carried out in accordance with the processes and required quality described in the SESAR3JU Project Handbook

Description
Throughout the project's lifecycle, the Project Management and Coordination work package will ensure the smooth operation and successful delivery of the project. Led by THALES LAS FRANCE, with the involvement of all partners, this work package will encompass a range of activities to maintain project momentum, quality, and stakeholder engagement. Project Monitoring and Control will be a continuous process, with day-to-day oversight of project progress, timetable adherence, and deliverables acceptance. The project manager will ensure that the project's quality aligns with the standards defined in the project management handbook, and that all partners are actively contributing to the overall project objectives. Administrative tasks, including ethical aspects and gender equality considerations, will be managed in accordance with the Grant Agreement. To facilitate effective decision-making and communication, Steering Committees will be organized twice a year, and Project Management Board meetings will be held monthly. Regular progress reports will be submitted to the SESAR Joint Undertaking (SJU), with the project manager being accountable for Maturity Gates. Communication, Exploitation, and Dissemination activities will be managed to maximize the project's impact and visibility. A dedicated Communication, Exploitation, and Dissemination Plan will be developed and regularly updated, with input from communication experts at THALES LAS FRNACE and the SJU. An Advisory Board will be established to provide strategic guidance and support the project's objectives. Transversal Activities will address cross-cutting aspects of the project. Risk Management will involve the identification, monitoring, and mitigation of risks, issues, and opportunities (RIO) using a structured approach. Data Management will be governed by a Data Management Plan (DMP), outlining data usage, governance, and storage. Content Integration will ensure the technical coordination between project components and the SESAR architecture, while contributing to the overall SESAR program roadmap. Grant Management will involve close coordination with relevant teams and the SJU grant manager to ensure timely and accurate periodic reporting and management of any grant amendments. The project manager will be responsible for the formal reporting to the SJU and addressing any queries raised during the deliverable assessment process. Quality Assessment of Deliverables will ensure that all project outputs meet the required standards and are submitted in a timely manner. A quality checklist will be implemented to minimize issues and reduce rework. The project manager will oversee the resolution of any queries raised by the SJU during the formal assessment of deliverables. Main deliverables Initial versions of the following documents will be delivered at the end of the first period. Project Management Plan (PMP) (D1.1), Communication, Dissemination and Exploitation Plan (CDE) (D1.2), Data Management Plan (DMP) (D1.3), 1.4 – Management Progress Report 2026 (D1.4),D1.5 – Communication, Dissemination and Exploitation Plan (CDE) - Update. WP1 includes three milestones : M1 (Kickoff meeting) , M5 (Project Review 1) and M13 (Benefits Impact Mechanism) applicable to both solutions (SOL1 and SOL2).

Work package WP2 – Support to advanced operational concepts - first period

Work Package Number	WP2	Lead Beneficiary	1 - THALES LAS

Work Package Name	Support to advanced operational concepts - first period		
Start Month	1	End Month	18

Objectives

The core objective of this Work Package is to define, develop and tests the ATM solution 1 " Enabling advanced operational concepts " in accordance with the SESAR Project Handbook (edition 02.00, 19 December 2024). This includes the development of elementary tools within an AI-based digital assistant to automate different types of Air Traffic Controllers (ATCO) tasks (in accordance with EASA AI Roadmap 2.0).
Existing operational concepts will be refined, and specific use cases will be refined and defined to assess the human factors impacts and operational benefits of the prototyped automated features. Target groups of users will participate in validation session to assess these benefits through real time simuation exercises.

Description

Description of work Dependencies The main inputs for this work package are the OSED/SPR/INTEROP either from existing SESAR project in previous calls, or from granted SESAR3 IR2 projects, and in particular those covering the WA1, WA3 and WA5. Solution Management The Solution project manager will coordinate all activities for the implementation of the following processes defined in the SESAR Project Handbook (edition 02.00, 19 December 2024) for the solution-specific aspects related to the work package : management of changes in the project's R&I work; content integration and maturity assessment. Additionally, monthly progess meetings with the solution partners will be held to steer its execution.
Requirements developments

Refine the existing OSED/SPR/INTEROP to complement any items that need to comply with the solution, including Safety and Security cases as long as human performance cases. Maturity Assessment tasks

The Solution project manager will lead the maturity assessment process at solution level. The initial starting maturity level will be assessed and the target TRL6 will be verified through concept validation activities performed in this work package. In particular, this assessment will be done thanks to concept validation through real time simulation exercises and initial prototypes demonstrating technical feasibility and potential benefits of the technological solution.

Technical Specification Based on available CONOPS, the system impacts will be assessed, and the system requirements and interfaces will be defined (Inter-operability, system architecture, data model and governance, IT and cyber security, Service Level Agreements, integration). The components that constitute the Solution will be identified and specified, as long as the Solution environmental performance monitoring strategy (KPIs, monitoring tools,process). To validate the targeted specification a first step of fast prototyping / early validation will be conducted in order to formalise the initial User EXperience/User Interface (UX/UI) and validate the expectations from the target user group of ATCOs. Dedicated workshops will be held in support to the activities to describe the expected Solution HMI with operators.
The AI components that constitute the Solution will be assessed for basic robustness and will be delivered with a learning assurance report based on simplified EASA guidance

Validation Plan Development of the Validation Plan covering both planning and execution phase. The exercise leaders will contribute exercise descriptions to be included in the validation plan. The validation exercises will be conducted in accordance with the VALP.

Development and validation The ATM Solution 1 comprises expert groups of ATCO that will contribute to real time simulation and live trials exercises. Thales LAS and Thales AVS will develop prototypes and platforms, in accordance with the initial TS/IRS, and for the purposes of supporting the validation exercises. One exercise leader per ANSP will oversee the testing and acceptance testing of the prototype and platform configuration prior to the validation exercise, considering readiness to perform the validation exercise and any limitations. The exercise leaders will oversee the conduct of the validation exercises that will cover a set of subjects through Real-Time Simulation sessions to Human-In-the-Loop evaluations. These will validate the feasibility and benefits of the fully automated ATC solution in a very high complexity airspace, and the behaviour and procedures to be applied in case of degradation.

Safety and Human Performance

The main contributors will be the ANSPs and airspace users. The Safety and Human Performance assessment plans will form a part of the VALP and, as such, will be subject to an assessment by the SJU. These sections of the VALP will be developed considering the results of the validation exercises.

Regarding AI-driven voice-recognition the consortium recognises that gender influences both the technical performance and user experience. To ensure inclusive, unbiased outcomes, the project will perform a data audit (verify that training corpora contain balanced representation of gender identities, subject to data accessibility and GDPR compliance). In any case there is already a disparity in the training dataset directly linked to the gender representation within ATCOs and pilots.
The project will collect performance metrics (e.g., word-error rate, latency) during model validation and report any gender disparities.
In term of human-AI teaming the project will give the opportunity to assess the different level of interaction starting from AI helping the ATCO in their daily work to ATCO supervising AI fully performing the air traffic control tasks (from EASA Level 2A to 3A). To do so the project will develop some explainability capabilities of the AI components. These capabilities should help to pave the way to AI safety assurance demonstration.

AI Trustworthiness and EASA AI Roadmap 2.0 Compliance
IA considerations will be assessed as part of the VALP, such as:
- Robustness, including stress testing, performance degradation analysis, and behaviour under abnormal or degraded operational conditions;
- Explainability, including the selection and implementation of explainable AI techniques appropriate to the AI models used, and the provision of human-understandable outputs supporting operational decision-making;
- Learning assurance, including data governance measures, training/validation dataset control, bias monitoring, model versioning, and change management procedures;
- Human–AI teaming, including role allocation, authority management, transparency of AI recommendations, and fallback mechanisms.
These AI-related validation results will be incorporated in the maturity assessment and TRL progression

Cost-Benefit Analysis and Performance Assessment

develop the TRL6 CBA for the SESAR Technical Solution 1. An initial CBA will be submitted to the SJU as a formal deliverable at the end of the first period phase of the WP2. The document will then be updated, considering the results of the validation exercises and the performance assessment results, and will then be submitted as a formal deliverable for the final data pack.

STAND and REG Identify the standards and/or regulations pertaining to the solution, and to make a reasoned evaluation of whether additional standards and/or regulation elements are needed.
Set-up EASA service contract with the consortium and obtain initial contribution of the agency to the project. Set-up agreement with Eurocae WG130 and Eurocontrol on a work plan to share and validate conclusions for standardisation needs.

Main deliverables of WP2 are the following :

D2.1 – Technical specifications/interface requirements TS/IRS ATM Solution 1 - initial
D2.2 – Technological validation plan TVALP ATM Solution 1 - initial
D2.3 – Technological validation report TVALR ATM Solution 1 - initial
D2.4 – Cost-Benefit Analysis - Technological CBAT ATM Solution 1 - initial
D2.5 – Standardisation STAND ATM Solution 1 - initial
D2.6 – REG ATM Solution 1 - initial
D2.7 – REG ATM Solution 1 - update
D2.8 – Solution 1 Slides - PRM1

Work package WP3 – Next generation ATS platform architecture & deployment - first period

Work Package Number	WP3	**Lead Beneficiary**	1 - THALES LAS
Work Package Name	Next generation ATS platform architecture & deployment - first period		
Start Month	1	**End Month**	18

Objectives

The core objective of this Work Package is to define, develop and tests the ATM solution 2 " Architecture and infrastructure of future ATS platform " in accordance with the SESAR Project Handbook (edition 02.00, 19 December 2024). This covers two primary axes. First, it will delve into the impacts of the New Service Delivery Model, focusing on defining and prototyping services, and conducting experiments to ensure interchangeability concept feasibility. Second, it will cover activities to prototype and experiment with "ATM in the cloud," scrutinizing deployment patterns and performing rigorous analysis of performance and overall impact. The goal is to develop and demonstrate technical prototypes that achieve Technology Readiness Level 6 (TRL6).

Description

Description of work
Dependencies Level 2 Architecture defined in the New Service Delivery Model. Provision for the services available from third parties.

Solution Management The Solution project manager will coordinate all activities for the implementation of the following processes defined in the SESAR Project Handbook (edition 02.00, 19 December 2024) for the solution-specific aspects related to the work package: management of changes in the project's R&I work; content integration and maturity assessment. Additionally, monthly progress meetings with the solution partners will be held to steer its execution.

Maturity Assessment tasks The Solution project manager will lead the maturity assessment process at solution level. The initial starting maturity level will be assessed and the target TRL6 will be verified through concept validation activities performed in this work package. In particular, this assessment will be done thanks to concept validation through real time simulation exercises and initial prototypes demonstrating technical feasibility and potential benefits of the technological solution.

WP3.1 Leveraging Service Oriented Architecture

Technical Specification Identify the technical use cases that will validate the reliability, performance, constraints and interfaces. The system impacts will be assessed, and the system requirements and interfaces will be defined (Inter-operability, system architecture, data model and governance, Safety, IT and cyber security, Service Level Agreements, integration). The SWIM services that constitute the Solution will be identified and specified, and the Solution environmental performance monitoring strategy (KPIs, monitoring tools, process), and the associated SWIM interfaces will be published in the SWIM Registry. Development and validation Package and integrate SWIM services. Creation and packaging of the selected SWIM services with their publication to the SWIM Registry, adaptation of the ATS platform to consume the services. At least one service will be made available to third parties to have them shared and experimented openly. The SWIM service will be published in the SWIM registry. Technical demonstrations will be run to validate the behaviour and performance of the solution.

An early task to define and baseline concrete SWIM/AIRM aligned API schemas, including security and access control mechanisms, using recognised open standards. An interface catalogue will be established and maintained throughout the project to document services, data models, versions, and responsibilities.

WP3.2 ATM in the Cloud

Technical Specification Defining the cloud-based ATM platform in line with New Service Delivery Model and the associated Strategic Deployment Objective (SDO) from the European ATM Master Plan (2025 Edition). Identification and definition of the concept of operations, the architecture patterns, including the underlying technologies and a proposal for how to address performances, safety and security aspects. Development and validation Provide a flexible, scalable, resilient, and highly available cloud based ATS platform. Development of software prototypes and pre-integration at software level. Procurement and deployment of the necessary cloud infrastructure to support the functioning of the ATC services, including acquisition of cloud services, software licenses, and associated costs such as infrastructure support and maintenance, deployment of the prototype and integration. Technical validation exercise(s) unrolling the different use cases (documentation of validation exercises and evidence provision).

Cost-Benefit Analysis and Performance Assessment develop the TRL6/ V3 CBA for the SESAR Technical Solution 2. An initial CBA will be submitted to the SJU as a formal deliverable at the end of the first period phase of the WP2. The document will then be updated, considering the results of the validation exercises and the performance assessment results, and will then be submitted as a formal deliverable for the final data pack.

STAND and REG Identify the standards and/or regulations pertaining to the solution, and to make a reasoned evaluation of whether additional standards and/or regulation elements are needed. Set-up EASA service contract with the consortium and obtain initial contribution of the agency to the project. Set-up agreement with Eurocae WG130 and Eurocontrol on a work plan to share and validate conclusions for standardisation needs

Main deliverables of WP3 are the following :
D3.1 – Technical specifications/interface requirements TS/IRS ATM Solution 2 - initial
D3.2 – Technological validation plan TVALP ATM Solution 2 - initial
D3.3 – Technological validation report TVALR ATM Solution 2 - initial
D3.4 – Cost-Benefit Analysis - Technological CBAT ATM Solution 2 - initial
D3.5 – Standardisation STAND ATM Solution 2 - initial
D3.6 – REG ATM Solution 2 - initial
D3.7 – Standardisation STAND ATM Solution 2 - update
D3.8 – REG ATM Solution 2 - update
D3.9 – Solution 2 Slides - PRM1

Work package WP4 – Project Management & Coordination - second period

Work Package Number	WP4	**Lead Beneficiary**	1 - THALES LAS
Work Package Name	Project Management & Coordination - second period		
Start Month	19	**End Month**	36

Objectives
The objective of this work package is the same as the WP1 covering the period from month M19 to M36.

Description
The main activities and tasks for WP4 are the same as the ones on WP1. Project Closure Upon completion of the project's objectives and deliverables, the project manager will oversee the Formal Closure of the project, ensuring that all administrative and financial aspects are properly concluded. WP4 deliverables are the following : D4.1 – Project Management Plan (PMP) - final D4.2 – Communication, Dissemination and Exploitation Plan (CDE) - final D4.3 – Data Management Plan (DMP) - final D4.4 – Management Progress Report 2027 D4.5 – Management Progress Report 2028 D4.6 – Project Closure Report D4.7 – Communication, Dissemination and Exploitation Plan (CDE) - second update

Work package WP5 – Support to advanced operational concepts - second period

Work Package Number	WP5	**Lead Beneficiary**	1 - THALES LAS
Work Package Name	Support to advanced operational concepts - second period		
Start Month	19	**End Month**	36

Objectives
The objective of this work package is the same as the WP2 covering the period from month M19 to M36.

Description
The main activities and tasks for WP5 are the same as the ones on WP2. WP5 deliverables are the following : D5.1 – Contextual note ATM Solution 1 – final D5.2 – Technical specifications/interface requirements TS/IRS ATM Solution 1 - intermediate D5.3 – Technological validation plan TVALP ATM Solution 1 - final D5.4 – Technological validation report TVALR ATM Solution 1 - final D5.5 – Cost-Benefit Analysis - Technological CBAT ATM Solution 1 - final D5.6 – Standardisation STAND ATM Solution 1 - intermediate D5.7 – Contextual note ATM Solution 1 – initial D5.8 – Technical specifications/interface requirements TS/IRS ATM Solution 1 - final Update D5.9 – Standardisation STAND ATM Solution 1 - final update D5.10 – REG ATM Solution 1 - final update D5.11 – REG ATM Solution 1 - intermediate D5.12 – Solution 1 Slides - PRM2 D5.13 – Solution 1 Slides - MG

Work package WP6 – Next generation ATS platform architecture & deployment - second period

Work Package Number	WP6	**Lead Beneficiary**	1 - THALES LAS
Work Package Name	Next generation ATS platform architecture & deployment - second period		
Start Month	19	**End Month**	36

Objectives
The objective of this work package is the same as the WP3 covering the period from month M19 to M36.

Description
The main activities and tasks for WP6 are the same as the ones on WP3. WP6 deliverables are the following : D6.1 – Contextual note ATM Solution 2 - final D6.2 – Technical specifications/interface requirements TS/IRS ATM Solution 2 - intermediate D6.3 – Technological validation plan TVALP ATM Solution 2 - final D6.4 – Technological validation report TVALR ATM Solution 2 - final D6.5 – Cost-Benefit Analysis - Technological CBAT ATM Solution 2 - final D6.6 – Standardisation STAND ATM Solution 2 - intermediate D6.7 – REG ATM Solution 2 - intermediate D6.8 – Contextual note ATM Solution 2 - initial D6.9 – Technical specifications/interface requirements TS/IRS ATM Solution 2 - final Update D6.10 – Standardisation STAND ATM Solution 2 - final update D6.11 – REG ATM Solution 2 - final update D6.12 – Solution 2 Slides - PRM2 D6.13 – Solution 2 Slides - MG

STAFF EFFORT

Staff effort per participant

Grant Preparation (Work packages - Effort screen) — Enter the info.

Participant	WP1	WP2	WP3	WP4	WP5	WP6	Total Person-Months
1 - THALES LAS	39.77	307.34	668.91	48.77	286.55	661.22	2012.56
2 - THALES AVS	21.83	104.60	21.82			124.00	272.25
3 - DSNA	1.78	9.50	19.45	1.78	19.10	32.05	83.66
4 - LFV		19.30			28.90		48.20
5 - NAVIAIR		4.55			4.55		9.10
6 - ACG		4.50			4.50		9.00
7 - AIRNAV IRELAND		4.55			4.55		9.10
8 - CCL		4.40			4.40		8.80
9 - NAV PORTUGAL		4.50			4.90		9.40
10 - HC	0.50	4.25	1.00	0.50	4.25	1.00	11.50
11 - SSG		31.50	2.00	33.50		72.50	139.50
12 - SITTI	7.00	19.00	68.00	7.00	19.00	68.00	188.00
13 - ENAC		8.00			8.00		16.00
14 - THALES CORTAIX		19.00			19.00		38.00
Total Person-Months	70.88	544.99	781.18	91.55	407.70	958.77	2855.07

LIST OF DELIVERABLES

Deliverables

Grant Preparation (Deliverables screen) — Enter the info.

The labels used mean:

Public — fully open (⚠ automatically posted online)
Sensitive — limited under the conditions of the Grant Agreement
EU classified —RESTREINT-UE/EU-RESTRICTED, CONFIDENTIEL-UE/EU-CONFIDENTIAL, SECRET-UE/EU-SECRET under Decision 2015/444

Deliverable No	Deliverable Name	Work Package No	Lead Beneficiary	Type	Dissemination Level	Due Date (month)
D1.1	Project Management Plan (PMP) - initial	WP1	1 - THALES LAS	R — Document, report	SEN - Sensitive	3
D1.2	Communication, Dissemination and Exploitation Plan (CDE) - initial	WP1	1 - THALES LAS	R — Document, report	PU - Public	3
D1.3	Data Management Plan (DMP) - initial	WP1	1 - THALES LAS	DMP — Data Management Plan	SEN - Sensitive	6
D1.4	Management Progress Report 2026	WP1	1 - THALES LAS	R — Document, report	PU - Public	9
D1.5	Communication, Dissemination and Exploitation Plan (CDE) - Update	WP1	1 - THALES LAS	R — Document, report	PU - Public	8
D2.1	Technical specifications/interface requirements TS/IRS ATM Solution 1 - initial	WP2	1 - THALES LAS	R — Document, report	PU - Public	5
D2.2	Technological validation plan TVALP ATM Solution 1 - initial	WP2	1 - THALES LAS	R — Document, report	PU - Public	8
D2.3	Technological validation report TVALR ATM Solution 1 - initial	WP2	1 - THALES LAS	R — Document, report	PU - Public	17
D2.4	Cost-Benefit Analysis - Technological CBAT ATM Solution 1 - initial	WP2	1 - THALES LAS	R — Document, report	PU - Public	17

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Deliverable No	Deliverable Name	Work Package No	Lead Beneficiary	Type	Dissemination Level	Due Date (month)
D2.5	Standardisation STAND ATM Solution 1 - initial	WP2	1 - THALES LAS	R — Document, report	PU - Public	3
D2.6	REG ATM Solution 1 - initial	WP2	1 - THALES LAS	R — Document, report	PU - Public	3
D2.7	REG ATM Solution 1 - update	WP2	1 - THALES LAS	R — Document, report	PU - Public	8
D2.8	Solution 1 Slides - PRM1	WP2	1 - THALES LAS	R — Document, report	PU - Public	8
D3.1	Technical specifications/interface requirements TS/IRS ATM Solution 2 - initial	WP3	1 - THALES LAS	R — Document, report	PU - Public	5
D3.2	Technological validation plan TVALP ATM Solution 2 - initial	WP3	1 - THALES LAS	R — Document, report	PU - Public	8
D3.3	Technological validation report TVALR ATM Solution 2 - initial	WP3	1 - THALES LAS	R — Document, report	PU - Public	17
D3.4	Cost-Benefit Analysis - Technological CBAT ATM Solution 2 - initial	WP3	1 - THALES LAS	R — Document, report	PU - Public	17
D3.5	Standardisation STAND ATM Solution 2 - initial	WP3	1 - THALES LAS	R — Document, report	PU - Public	3
D3.6	REG ATM Solution 2 - initial	WP3	1 - THALES LAS	R — Document, report	PU - Public	3
D3.7	Standardisation STAND ATM Solution 2 - update	WP3	1 - THALES LAS	R — Document, report	PU - Public	8

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Deliverable No	Deliverable Name	Work Package No	Lead Beneficiary	Type	Dissemination Level	Due Date (month)
D3.8	REG ATM Solution 2 - update	WP3	1 - THALES LAS	R — Document, report	PU - Public	8
D3.9	Solution 2 Slides - PRM1	WP3	1 - THALES LAS	R — Document, report	PU - Public	8
D4.1	Project Management Plan (PMP) - final	WP4	1 - THALES LAS	R — Document, report	SEN - Sensitive	32
D4.2	Communication, Dissemination and Exploitation Plan (CDE) - final	WP4	1 - THALES LAS	R — Document, report	PU - Public	34
D4.3	Data Management Plan (DMP) - final	WP4	1 - THALES LAS	DMP — Data Management Plan	PU - Public	34
D4.4	Management Progress Report 2027	WP4	1 - THALES LAS	R — Document, report	PU - Public	21
D4.5	Management Progress Report 2028	WP4	1 - THALES LAS	R — Document, report	PU - Public	33
D4.6	Project Closure Report	WP4	1 - THALES LAS	R — Document, report	PU - Public	36
D4.7	Communication, Dissemination and Exploitation Plan (CDE) - second update	WP4	1 - THALES LAS	R — Document, report	PU - Public	20
D5.1	Contextual note ATM Solution 1 – final	WP5	1 - THALES LAS	R — Document, report	PU - Public	32
D5.2	Technical specifications/interface requirements TS/IRS ATM Solution 1 - intermediate	WP5	1 - THALES LAS	R — Document, report	PU - Public	20
D5.3	Technological validation plan TVALP ATM Solution 1 - final	WP5	1 - THALES LAS	R — Document, report	PU - Public	25

Deliverables

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Deliverable No	Deliverable Name	Work Package No	Lead Beneficiary	Type	Dissemination Level	Due Date (month)
D5.4	Technological validation report TVALR ATM Solution 1 - final	WP5	1 - THALES LAS	R — Document, report	PU - Public	31
D5.5	Cost-Benefit Analysis - Technological CBAT ATM Solution 1 - final	WP5	1 - THALES LAS	R — Document, report	PU - Public	31
D5.6	Standardisation STAND ATM Solution 1 - intermediate	WP5	1 - THALES LAS	R — Document, report	PU - Public	20
D5.7	Contextual note ATM Solution 1 – initial	WP5	1 - THALES LAS	R — Document, report	PU - Public	20
D5.8	Technical specifications/interface requirements TS/IRS ATM Solution 1 - final Update	WP5	1 - THALES LAS	R — Document, report	PU - Public	31
D5.9	Standardisation STAND ATM Solution 1 - final update	WP5	1 - THALES LAS	R — Document, report	PU - Public	32
D5.10	REG ATM Solution 1 - final update	WP5	1 - THALES LAS	R — Document, report	PU - Public	32
D5.11	REG ATM Solution 1 - intermediate	WP5	1 - THALES LAS	R — Document, report	PU - Public	20
D5.12	Solution 1 Slides - PRM2	WP5	2 - THALES AVS	R — Document, report	PU - Public	20
D5.13	Solution 1 Slides - MG	WP5	1 - THALES LAS	R — Document, report	PU - Public	33
D6.1	Contextual note ATM Solution 2 - final	WP6	1 - THALES LAS	R — Document, report	PU - Public	32
D6.2	Technical specifications/interface	WP6	1 - THALES LAS	R — Document, report	PU - Public	20

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Deliverable No	Deliverable Name	Work Package No	Lead Beneficiary	Type	Dissemination Level	Due Date (month)
	requirements TS/IRS ATM Solution 2 - intermediate					
D6.3	Technological validation plan TVALP ATM Solution 2 - final	WP6	1 - THALES LAS	R — Document, report	PU - Public	25
D6.4	Technological validation report TVALR ATM Solution 2 - final	WP6	1 - THALES LAS	R — Document, report	PU - Public	31
D6.5	Cost-Benefit Analysis - Technological CBAT ATM Solution 2 - final	WP6	1 - THALES LAS	R — Document, report	PU - Public	31
D6.6	Standardisation STAND ATM Solution 2 - intermediate	WP6	1 - THALES LAS	R — Document, report	PU - Public	20
D6.7	REG ATM Solution 2 - intermediate	WP6	1 - THALES LAS	R — Document, report	PU - Public	20
D6.8	Contextual note ATM Solution 2 - initial	WP6	1 - THALES LAS	R — Document, report	PU - Public	20
D6.9	Technical specifications/interface requirements TS/IRS ATM Solution 2 - final Update	WP6	1 - THALES LAS	R — Document, report	PU - Public	31
D6.10	Standardisation STAND ATM Solution 2 - final update	WP6	1 - THALES LAS	R — Document, report	PU - Public	32
D6.11	REG ATM Solution 2 - final update	WP6	1 - THALES LAS	R — Document, report	PU - Public	32
D6.12	Solution 2 Slides - PRM2	WP6	1 - THALES LAS	R — Document, report	PU - Public	20
D6.13	Solution 2 Slides - MG	WP6	1 - THALES LAS	R — Document, report	PU - Public	33

Deliverable D1.1 – Project Management Plan (PMP) - initial

Deliverable Number	D1.1	**Lead Beneficiary**	1 - THALES LAS
Deliverable Name	Project Management Plan (PMP) - initial		
Type	R — Document, report	**Dissemination Level**	SEN - Sensitive
Due Date (month)	3	**Work Package No**	WP1

Description
The Project Management Plan (PMP) defines how the project is executed, monitored and controlled, and finally closed.

Deliverable D1.2 – Communication, Dissemination and Exploitation Plan (CDE) - initial

Deliverable Number	D1.2	**Lead Beneficiary**	1 - THALES LAS
Deliverable Name	Communication, Dissemination and Exploitation Plan (CDE) - initial		
Type	R — Document, report	**Dissemination Level**	PU - Public
Due Date (month)	3	**Work Package No**	WP1

Description
The Communication, Dissemination and Exploitation Plan (CDE) defines how the project activities and results are communicated and shared to the community, and how the results can be used and extended to the interest of the community.

Deliverable D1.3 – Data Management Plan (DMP) - initial

Deliverable Number	D1.3	**Lead Beneficiary**	1 - THALES LAS
Deliverable Name	Data Management Plan (DMP) - initial		
Type	DMP — Data Management Plan	**Dissemination Level**	SEN - Sensitive
Due Date (month)	6	**Work Package No**	WP1

Description
The Data Management Plan (DMP) defines a set of rules for document and data production and delivery that are to be applied across the project, including amongst all project members and sub-contractors.

Deliverable D1.4 – Management Progress Report 2026

Deliverable Number	D1.4	**Lead Beneficiary**	1 - THALES LAS
Deliverable Name	Management Progress Report 2026		
Type	R — Document, report	**Dissemination Level**	PU - Public
Due Date (month)	9	**Work Package No**	WP1

Description
Summary of the project review.

Deliverable D1.5 – Communication, Dissemination and Exploitation Plan (CDE) - Update

Deliverable Number	D1.5	**Lead Beneficiary**	1 - THALES LAS
Deliverable Name	Communication, Dissemination and Exploitation Plan (CDE) - Update		
Type	R — Document, report	**Dissemination Level**	PU - Public
Due Date (month)	8	**Work Package No**	WP1

Description
The Communication, Dissemination and Exploitation Plan (CDE) defines how the project activities and results are communicated and shared to the community, and how the results can be used and extended to the interest of the community.

Deliverable D2.1 – Technical specifications/interface requirements TS/IRS ATM Solution 1 - initial

Deliverable Number	D2.1	**Lead Beneficiary**	1 - THALES LAS
Deliverable Name	Technical specifications/interface requirements TS/IRS ATM Solution 1 - initial		
Type	R — Document, report	**Dissemination Level**	PU - Public
Due Date (month)	5	**Work Package No**	WP2

Description
The TS/IRS document outlines the functional, non-functional, and interface requirements for the ATM Solution. It specifies what the solution should do, not how, focusing on functional descriptions and logical interfaces with the ATM system. The initial version will cover the sub-scope of the first period.

Deliverable D2.2 – Technological validation plan TVALP ATM Solution 1 - initial

Deliverable Number	D2.2	**Lead Beneficiary**	1 - THALES LAS
Deliverable Name	Technological validation plan TVALP ATM Solution 1 - initial		
Type	R — Document, report	**Dissemination Level**	PU - Public
Due Date (month)	8	**Work Package No**	WP2

Description
The validation plan outlines how to prepare and execute validation exercises to achieve validation objectives. It includes necessary exercises to ensure the Solution progresses from the initial to the target maturity level. The initial version will cover the sub-scope of the first period.

Deliverable D2.3 – Technological validation report TVALR ATM Solution 1 - initial

Deliverable Number	D2.3	**Lead Beneficiary**	1 - THALES LAS
Deliverable Name	Technological validation report TVALR ATM Solution 1 - initial		
Type	R — Document, report	**Dissemination Level**	PU - Public
Due Date (month)	17	**Work Package No**	WP2

Description
The validation report compiles the validation results for the Solution once the validation activities for a specific maturity level are completed. The initial version will cover the sub-scope of the first period.

Deliverable D2.4 – Cost-Benefit Analysis - Technological CBAT ATM Solution 1 - initial

Deliverable Number	D2.4	**Lead Beneficiary**	1 - THALES LAS
Deliverable Name	Cost-Benefit Analysis - Technological CBAT ATM Solution 1 - initial		
Type	R — Document, report	**Dissemination Level**	PU - Public
Due Date (month)	17	**Work Package No**	WP2

Description
The initial cost-benefit analysis (CBA) documents the potential benefits of deploying the Solution in the applicable environment(s).

Deliverable D2.5 – Standardisation STAND ATM Solution 1 - initial

Deliverable Number	D2.5	**Lead Beneficiary**	1 - THALES LAS
Deliverable Name	Standardisation STAND ATM Solution 1 - initial		
Type	R — Document, report	**Dissemination Level**	PU - Public
Due Date (month)	3	**Work Package No**	WP2

Description
The Standardisation document provides the detailed activities for standardisation of the Solution. The initial version will be a draft version.

Deliverable D2.6 – REG ATM Solution 1 - initial

Deliverable Number	D2.6	**Lead Beneficiary**	1 - THALES LAS
Deliverable Name	REG ATM Solution 1 - initial		
Type	R — Document, report	**Dissemination Level**	PU - Public
Due Date (month)	3	**Work Package No**	WP2

Description
The Regulation document provides the means of compliance to demonstrate compliance with the SES basic regulation and its implementing rules.

Deliverable D2.7 – REG ATM Solution 1 - update

Deliverable Number	D2.7	**Lead Beneficiary**	1 - THALES LAS
Deliverable Name	REG ATM Solution 1 - update		
Type	R — Document, report	**Dissemination Level**	PU - Public

Due Date (month)	8	Work Package No	WP2

Description
The Regulation document provides the means of compliance to demonstrate compliance with the SES basic regulation and its implementing rules.

Deliverable D2.8 – Solution 1 Slides - PRM1

Deliverable Number	D2.8	Lead Beneficiary	1 - THALES LAS
Deliverable Name	Solution 1 Slides - PRM1		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	8	Work Package No	WP2

Description
Solution slides to support the Project Review.

Deliverable D3.1 – Technical specifications/interface requirements TS/IRS ATM Solution 2 - initial

Deliverable Number	D3.1	Lead Beneficiary	1 - THALES LAS
Deliverable Name	Technical specifications/interface requirements TS/IRS ATM Solution 2 - initial		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	5	Work Package No	WP3

Description
The TS/IRS document outlines the functional, non-functional, and interface requirements for the ATM Solution. It specifies what the solution should do, not how, focusing on functional descriptions and logical interfaces with the ATM system. The initial version will cover the sub-scope of the first period.

Deliverable D3.2 – Technological validation plan TVALP ATM Solution 2 - initial

Deliverable Number	D3.2	Lead Beneficiary	1 - THALES LAS
Deliverable Name	Technological validation plan TVALP ATM Solution 2 - initial		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	8	Work Package No	WP3

Description
The validation plan outlines how to prepare and execute validation exercises to achieve validation objectives. It includes necessary exercises to ensure the Solution progresses from the initial to the target maturity level. The initial version will cover the sub-scope of the first period.

Deliverable D3.3 – Technological validation report TVALR ATM Solution 2 - initial

Deliverable Number	D3.3	**Lead Beneficiary**	1 - THALES LAS
Deliverable Name	Technological validation report TVALR ATM Solution 2 - initial		
Type	R — Document, report	**Dissemination Level**	PU - Public
Due Date (month)	17	**Work Package No**	WP3

Description
The validation report compiles the validation results for the Solution once the validation activities for a specific maturity level are completed. The initial version will cover the sub-scope of the first period.

Deliverable D3.4 – Cost-Benefit Analysis - Technological CBAT ATM Solution 2 - initial

Deliverable Number	D3.4	**Lead Beneficiary**	1 - THALES LAS
Deliverable Name	Cost-Benefit Analysis - Technological CBAT ATM Solution 2 - initial		
Type	R — Document, report	**Dissemination Level**	PU - Public
Due Date (month)	17	**Work Package No**	WP3

Description
The initial cost-benefit analysis (CBA) documents the potential benefits of deploying the Solution in the applicable environment(s).

Deliverable D3.5 – Standardisation STAND ATM Solution 2 - initial

Deliverable Number	D3.5	**Lead Beneficiary**	1 - THALES LAS
Deliverable Name	Standardisation STAND ATM Solution 2 - initial		
Type	R — Document, report	**Dissemination Level**	PU - Public
Due Date (month)	3	**Work Package No**	WP3

Description
The Standardisation document provides the detailed activities for standardisation of the Solution. The initial version will be a draft version.

Deliverable D3.6 – REG ATM Solution 2 - initial

Deliverable Number	D3.6	**Lead Beneficiary**	1 - THALES LAS
Deliverable Name	REG ATM Solution 2 - initial		
Type	R — Document, report	**Dissemination Level**	PU - Public
Due Date (month)	3	**Work Package No**	WP3

Description
The Regulation document provides the means of compliance to demonstrate compliance with the SES basic regulation and its implementing rules.

Deliverable D3.7 – Standardisation STAND ATM Solution 2 - update

Deliverable Number	D3.7	**Lead Beneficiary**	1 - THALES LAS
Deliverable Name	Standardisation STAND ATM Solution 2 - update		
Type	R — Document, report	**Dissemination Level**	PU - Public
Due Date (month)	8	**Work Package No**	WP3

Description
The Standardisation document provides the detailed activities for standardisation of the Solution. The version will be an update of the initial draft.

Deliverable D3.8 – REG ATM Solution 2 - update

Deliverable Number	D3.8	**Lead Beneficiary**	1 - THALES LAS
Deliverable Name	REG ATM Solution 2 - update		
Type	R — Document, report	**Dissemination Level**	PU - Public
Due Date (month)	8	**Work Package No**	WP3

Description
The Regulation document provides the means of compliance to demonstrate compliance with the SES basic regulation and its implementing rules.

Deliverable D3.9 – Solution 2 Slides - PRM1

Deliverable Number	D3.9	**Lead Beneficiary**	1 - THALES LAS
Deliverable Name	Solution 2 Slides - PRM1		
Type	R — Document, report	**Dissemination Level**	PU - Public
Due Date (month)	8	**Work Package No**	WP3

Description
Solution slides to support project review

Deliverable D4.1 – Project Management Plan (PMP) - final

Deliverable Number	D4.1	**Lead Beneficiary**	1 - THALES LAS
Deliverable Name	Project Management Plan (PMP) - final		
Type	R — Document, report	**Dissemination Level**	SEN - Sensitive
Due Date (month)	32	**Work Package No**	WP4

Description
The Project Management Plan (PMP) defines how the project is executed, monitored and controlled, and finally closed.

Deliverable D4.2 – Communication, Dissemination and Exploitation Plan (CDE) - final

Deliverable Number	D4.2	**Lead Beneficiary**	1 - THALES LAS
Deliverable Name	Communication, Dissemination and Exploitation Plan (CDE) - final		
Type	R — Document, report	**Dissemination Level**	PU - Public
Due Date (month)	34	**Work Package No**	WP4

Description
The Communication, Dissemination and Exploitation Plan (CDE) defines how the project activities and results are communicated and shared to the community, and how the results can be used and extended to the interest of the community.

Deliverable D4.3 – Data Management Plan (DMP) - final

Deliverable Number	D4.3	**Lead Beneficiary**	1 - THALES LAS
Deliverable Name	Data Management Plan (DMP) - final		
Type	DMP — Data Management Plan	**Dissemination Level**	PU - Public
Due Date (month)	34	**Work Package No**	WP4

Description
The Data Management Plan (DMP) defines a set of rules for document and data production and delivery that are to be applied across the project, including amongst all project members and sub-contractors.

Deliverable D4.4 – Management Progress Report 2027

Deliverable Number	D4.4	**Lead Beneficiary**	1 - THALES LAS
Deliverable Name	Management Progress Report 2027		
Type	R — Document, report	**Dissemination Level**	PU - Public
Due Date (month)	21	**Work Package No**	WP4

Description
Summary of the project review.

Deliverable D4.5 – Management Progress Report 2028

Deliverable Number	D4.5	**Lead Beneficiary**	1 - THALES LAS
Deliverable Name	Management Progress Report 2028		
Type	R — Document, report	**Dissemination Level**	PU - Public
Due Date (month)	33	**Work Package No**	WP4

Description
Summary of the project review.

Deliverable D4.6 – Project Closure Report

Deliverable Number	D4.6	Lead Beneficiary	1 - THALES LAS
Deliverable Name	Project Closure Report		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	36	Work Package No	WP4

Description
Summary of the project closure.

Deliverable D4.7 – Communication, Dissemination and Exploitation Plan (CDE) - second update

Deliverable Number	D4.7	Lead Beneficiary	1 - THALES LAS
Deliverable Name	Communication, Dissemination and Exploitation Plan (CDE) - second update		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	20	Work Package No	WP4

Description
The Communication, Dissemination and Exploitation Plan (CDE) defines how the project activities and results are communicated and shared to the community, and how the results can be used and extended to the interest of the community.

Deliverable D5.1 – Contextual note ATM Solution 1 – final

Deliverable Number	D5.1	Lead Beneficiary	1 - THALES LAS
Deliverable Name	Contextual note ATM Solution 1 – final		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	32	Work Package No	WP5

Description
The final contextual note completes the initial one and includes recommendations for the solution industrialization and deployment activities.

Deliverable D5.2 – Technical specifications/interface requirements TS/IRS ATM Solution 1 - intermediate

Deliverable Number	D5.2	Lead Beneficiary	1 - THALES LAS
Deliverable Name	Technical specifications/interface requirements TS/IRS ATM Solution 1 - intermediate		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	20	Work Package No	WP5

Description

The TS/IRS document outlines the functional, non-functional, and interface requirements for the ATM Solution. It specifies what the solution should do, not how, focusing on functional descriptions and logical interfaces with the ATM system. The final version will cover the full scope of the solution.

Deliverable D5.3 – Technological validation plan TVALP ATM Solution 1 - final

Deliverable Number	D5.3	**Lead Beneficiary**	1 - THALES LAS
Deliverable Name	Technological validation plan TVALP ATM Solution 1 - final		
Type	R — Document, report	**Dissemination Level**	PU - Public
Due Date (month)	25	**Work Package No**	WP5

Description
The validation plan outlines how to prepare and execute validation exercises to achieve validation objectives. It includes necessary exercises to ensure the Solution progresses from the initial to the target maturity level. The initial version will cover the full-scope of the solution.

Deliverable D5.4 – Technological validation report TVALR ATM Solution 1 - final

Deliverable Number	D5.4	**Lead Beneficiary**	1 - THALES LAS
Deliverable Name	Technological validation report TVALR ATM Solution 1 - final		
Type	R — Document, report	**Dissemination Level**	PU - Public
Due Date (month)	31	**Work Package No**	WP5

Description
The validation report compiles the validation results for the Solution once the validation activities for a specific maturity level are completed. The initial version will cover the full-scope of the solution.

Deliverable D5.5 – Cost-Benefit Analysis - Technological CBAT ATM Solution 1 - final

Deliverable Number	D5.5	**Lead Beneficiary**	1 - THALES LAS
Deliverable Name	Cost-Benefit Analysis - Technological CBAT ATM Solution 1 - final		
Type	R — Document, report	**Dissemination Level**	PU - Public
Due Date (month)	31	**Work Package No**	WP5

Description
The final cost-benefit analysis (CBA) complete the initial one and assesses whether these benefits are expected to outweigh the costs over a given time horizon.

Deliverable D5.6 – Standardisation STAND ATM Solution 1 - intermediate

Deliverable Number	D5.6	**Lead Beneficiary**	1 - THALES LAS
Deliverable Name	Standardisation STAND ATM Solution 1 - intermediate		
Type	R — Document, report	**Dissemination Level**	PU - Public

Due Date (month)	20	Work Package No	WP5

Description
The Standardisation document provides the detailed activities for standardisation of the Solution.

Deliverable D5.7 – Contextual note ATM Solution 1 – initial

Deliverable Number	D5.7	Lead Beneficiary	1 - THALES LAS
Deliverable Name	Contextual note ATM Solution 1 – initial		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	20	Work Package No	WP5

Description
The initial contextual note introduces the ATM Solution covering its scope, main operational and performance benefits, and relevant system impacts.

Deliverable D5.8 – Technical specifications/interface requirements TS/IRS ATM Solution 1 - final Update

Deliverable Number	D5.8	Lead Beneficiary	1 - THALES LAS
Deliverable Name	Technical specifications/interface requirements TS/IRS ATM Solution 1 - final Update		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	31	Work Package No	WP5

Description
The final TS/IRS document update after the VLAR.

Deliverable D5.9 – Standardisation STAND ATM Solution 1 - final update

Deliverable Number	D5.9	Lead Beneficiary	1 - THALES LAS
Deliverable Name	Standardisation STAND ATM Solution 1 - final update		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	32	Work Package No	WP5

Description
The Standardisation document provides the detailed activities for standardisation of the Solution (Final Update).

Deliverable D5.10 – REG ATM Solution 1 - final update

Deliverable Number	D5.10	Lead Beneficiary	1 - THALES LAS
Deliverable Name	REG ATM Solution 1 - final update		
Type	R — Document, report	Dissemination Level	PU - Public

Due Date (month)	32	**Work Package No**	WP5

Description
The Regulation document provides the means of compliance to demonstrate compliance with the SES basic regulation and its implementing rules.

Deliverable D5.11 – REG ATM Solution 1 - intermediate

Deliverable Number	D5.11	**Lead Beneficiary**	1 - THALES LAS
Deliverable Name	REG ATM Solution 1 - intermediate		
Type	R — Document, report	**Dissemination Level**	PU - Public
Due Date (month)	20	**Work Package No**	WP5

Description
The Regulation document provides the means of compliance to demonstrate compliance with the SES basic regulation and its implementing rules.

Deliverable D5.12 – Solution 1 Slides - PRM2

Deliverable Number	D5.12	**Lead Beneficiary**	2 - THALES AVS
Deliverable Name	Solution 1 Slides - PRM2		
Type	R — Document, report	**Dissemination Level**	PU - Public
Due Date (month)	20	**Work Package No**	WP5

Description
Solution slides to support project review

Deliverable D5.13 – Solution 1 Slides - MG

Deliverable Number	D5.13	**Lead Beneficiary**	1 - THALES LAS
Deliverable Name	Solution 1 Slides - MG		
Type	R — Document, report	**Dissemination Level**	PU - Public
Due Date (month)	33	**Work Package No**	WP5

Description
Solution slides to support Maturity Gate

Deliverable D6.1 – Contextual note ATM Solution 2 - final

Deliverable Number	D6.1	**Lead Beneficiary**	1 - THALES LAS
Deliverable Name	Contextual note ATM Solution 2 - final		
Type	R — Document, report	**Dissemination Level**	PU - Public

Due Date (month)	32	Work Package No	WP6

Description
The final contextual note completes the initial one and includes recommendations for the solution industrialization and deployment activities.

Deliverable D6.2 – Technical specifications/interface requirements TS/IRS ATM Solution 2 - intermediate

Deliverable Number	D6.2	Lead Beneficiary	1 - THALES LAS
Deliverable Name	Technical specifications/interface requirements TS/IRS ATM Solution 2 - intermediate		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	20	Work Package No	WP6

Description
The TS/IRS document outlines the functional, non-functional, and interface requirements for the ATM Solution. It specifies what the solution should do, not how, focusing on functional descriptions and logical interfaces with the ATM system. The final version will cover the full scope of the solution.

Deliverable D6.3 – Technological validation plan TVALP ATM Solution 2 - final

Deliverable Number	D6.3	Lead Beneficiary	1 - THALES LAS
Deliverable Name	Technological validation plan TVALP ATM Solution 2 - final		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	25	Work Package No	WP6

Description
The validation plan outlines how to prepare and execute validation exercises to achieve validation objectives. It includes necessary exercises to ensure the Solution progresses from the initial to the target maturity level. The initial version will cover the full-scope of the solution.

Deliverable D6.4 – Technological validation report TVALR ATM Solution 2 - final

Deliverable Number	D6.4	Lead Beneficiary	1 - THALES LAS
Deliverable Name	Technological validation report TVALR ATM Solution 2 - final		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	31	Work Package No	WP6

Description
The validation report compiles the validation results for the Solution once the validation activities for a specific maturity level are completed. The initial version will cover the full-scope of the solution.

Deliverable D6.5 – Cost-Benefit Analysis - Technological CBAT ATM Solution 2 - final

Deliverable Number	D6.5	**Lead Beneficiary**	1 - THALES LAS
Deliverable Name	Cost-Benefit Analysis - Technological CBAT ATM Solution 2 - final		
Type	R — Document, report	**Dissemination Level**	PU - Public
Due Date (month)	31	**Work Package No**	WP6

Description
The final cost-benefit analysis (CBA) completes the initial one and assesses whether these benefits are expected to outweigh the costs over a given time horizon.

Deliverable D6.6 – Standardisation STAND ATM Solution 2 - intermediate

Deliverable Number	D6.6	**Lead Beneficiary**	1 - THALES LAS
Deliverable Name	Standardisation STAND ATM Solution 2 - intermediate		
Type	R — Document, report	**Dissemination Level**	PU - Public
Due Date (month)	20	**Work Package No**	WP6

Description
The Standardisation document provides the detailed activities for standardisation of the Solution.

Deliverable D6.7 – REG ATM Solution 2 - intermediate

Deliverable Number	D6.7	**Lead Beneficiary**	1 - THALES LAS
Deliverable Name	REG ATM Solution 2 - intermediate		
Type	R — Document, report	**Dissemination Level**	PU - Public
Due Date (month)	20	**Work Package No**	WP6

Description
The Regulation document provides the means of compliance to demonstrate compliance with the SES basic regulation and its implementing rules.

Deliverable D6.8 – Contextual note ATM Solution 2 - initial

Deliverable Number	D6.8	**Lead Beneficiary**	1 - THALES LAS
Deliverable Name	Contextual note ATM Solution 2 - initial		
Type	R — Document, report	**Dissemination Level**	PU - Public
Due Date (month)	20	**Work Package No**	WP6

Description
The initial contextual note introduces the ATM Solution covering its scope, main operational and performance benefits, and relevant system impacts.

Deliverable D6.9 – Technical specifications/interface requirements TS/IRS ATM Solution 2 - final Update

Deliverable Number	D6.9	**Lead Beneficiary**	1 - THALES LAS
Deliverable Name	Technical specifications/interface requirements TS/IRS ATM Solution 2 - final Update		
Type	R — Document, report	**Dissemination Level**	PU - Public
Due Date (month)	31	**Work Package No**	WP6

Description
The final TS/IRS document update after the VLAR.

Deliverable D6.10 – Standardisation STAND ATM Solution 2 - final update

Deliverable Number	D6.10	**Lead Beneficiary**	1 - THALES LAS
Deliverable Name	Standardisation STAND ATM Solution 2 - final update		
Type	R — Document, report	**Dissemination Level**	PU - Public
Due Date (month)	32	**Work Package No**	WP6

Description
The Standardisation document provides the detailed activities for standardisation of the Solution (Final Update).

Deliverable D6.11 – REG ATM Solution 2 - final update

Deliverable Number	D6.11	**Lead Beneficiary**	1 - THALES LAS
Deliverable Name	REG ATM Solution 2 - final update		
Type	R — Document, report	**Dissemination Level**	PU - Public
Due Date (month)	32	**Work Package No**	WP6

Description
The Regulation document provides the means of compliance to demonstrate compliance with the SES basic regulation and its implementing rules.

Deliverable D6.12 – Solution 2 Slides - PRM2

Deliverable Number	D6.12	**Lead Beneficiary**	1 - THALES LAS
Deliverable Name	Solution 2 Slides - PRM2		
Type	R — Document, report	**Dissemination Level**	PU - Public
Due Date (month)	20	**Work Package No**	WP6

Description
Solution slides to support project review

Deliverable D6.13 – Solution 2 Slides - MG

Deliverable Number	D6.13	**Lead Beneficiary**	1 - THALES LAS
Deliverable Name	Solution 2 Slides - MG		
Type	R — Document, report	**Dissemination Level**	PU - Public
Due Date (month)	33	**Work Package No**	WP6

Description
Solution slides to support Maturity Gate

LIST OF MILESTONES

Milestones

Grant Preparation (Milestones screen) — Enter the info.

Milestone No	Milestone Name	Work Package No	Lead Beneficiary	Means of Verification	Due Date (month)
1	Kick-off meeting	WP1	1 - THALES LAS	Kick-Off meeting notes agreed with SJU.	1
2	TS-1 Initial TRL6 Data Pack	WP5	1 - THALES LAS	Deliverables submitted to SJU and available for technical project review meeting	20
3	TS-2 Initial TRL6 Data Pack	WP6	1 - THALES LAS	Deliverables submitted to SJU and available for technical project review meeting	20
4	Project Closure	WP5	1 - THALES LAS	Final Report approved by SJU.	36
5	Project Review 1	WP1	1 - THALES LAS	All required material for the PRM shall be prepared and submitted before the meeting	9
6	Project Review 2	WP4	1 - THALES LAS	All required material for the PRM shall be prepared and submitted before the meeting	21
7	Open Day Solution 1	WP5	1 - THALES LAS	The open day will be organised after the exercises completion	30
8	Open Day Solution 2	WP6	1 - THALES LAS	The open day will be organised after the exercises completion	30
9	Maturity Gate Solution 1	WP5	1 - THALES LAS	All gate material shall be delivered before and maturity assessment performed before the gate.	34
10	Maturity Gate Solution 2	WP6	1 - THALES LAS	All gate material shall be delivered before and maturity assessment performed before the gate.	34
11	TS-1 Final TRL6 Data Pack	WP5	1 - THALES LAS	Deliverables submitted to SJU and available for final maturity gate.	32
12	TS-2 Final TRL6 Data Pack	WP6	1 - THALES LAS	Deliverables submitted to SJU and available for final maturity gate.	32

Milestones

Grant Preparation (Milestones screen) — Enter the info.

Milestone No	Milestone Name	Work Package No	Lead Beneficiary	Means of Verification	Due Date (month)
13	Benefits Impact Mechanism	WP1	1 - THALES LAS	EPCs agreed with SJU/SPARK to be integrated in the TS-IRS or OSED appendix	3
14	Integrated validation : HAVEN - other WA3.1 platforms EXE finished	WP6	1 - THALES LAS	Validation stream TS-2 – A SOA Shared services , TRL6 validation performed, results ready for VALR	28

LIST OF CRITICAL RISKS

Critical risks & risk management strategy

Grant Preparation (Critical Risks screen) — Enter the info.

Risk number	Description	Work Package No(s)	Proposed Mitigation Measures
1	Because of the dependency of some HAVEN activities with other projects, there is a risk that expected CONOPS/OSED or VALP won't be available on time, leading to delays in the project realisation.	WP5, WP2	In such case the partners of the HAVEN project will define sufficient assumptions, in terms of operational concepts and high-level validation objectives to perform the planned activities.
2	Because of the dependency of some HAVEN activities with other projects, there is a risk that expected CONOPS/OSED won't have the expected level of maturity, leading to issues in the project realisation.	WP5, WP2	In such case the partners of the HAVEN project will define sufficient assumptions, in terms of operational concepts and high-level validation objectives to perform the planned activities.
3	Because of the dependency of some HAVEN activities with other projects, there is a risk that	WP3, WP6	In such case the service implementation activity will be kept as part of HAVEN TS-2, and tests will be performed to integrate it on the HAVEN platform as an external service.

Critical risks & risk management strategy

Grant Preparation (Critical Risks screen) — Enter the info.

Risk number	Description	Work Package No(s)	Proposed Mitigation Measures
	expected shared service from tier suppliers won't be available, leading to technical demonstration issues in the project realisation.		
4	Because of problems raised during prototype development and platform integration, there is a risk that the scope and/or timing of validation exercises is affected, leading to reduced demonstration capability on some parts of the project.	WP5, WP2, WP3, WP6	Close monitoring of prototype development will be put in place in order to get early visibility of potential issues and resolutions Step by Step system testing and acceptance will be performed in advance of the validation exercise In such case, the limitations to the validation scope will be described in the availability note.
5	Because of the specific expertise needed on the HAVEN project, there is a risk the available resources are not available when needed, leading to a reduced capacity to perform the expected scope.	WP5, WP2, WP3, WP6	Close monitoring and confirmation of commitment to provide staff for all activities. In such case search for options in scope reduction or rescheduling of activities to accommodate with experts availability.
6	There is a risk that Solution 2 may not achieve TRL6 for all its components by the end of the project, in particular for the element related to deploying ATM services in the cloud. This risk is mainly for Use Case 2, which involves hybrid public/private cloud operations, due to the added complexity of ensuring interoperability, performance, and compliance across both environments.	WP3, WP6	The risk of not fully achieving TRL6 for hybrid public/private cloud ATM operations will be mitigated through an incremental and validation-driven approach. This includes early prototyping of hybrid architectures, phased integration of public and private cloud environments, and the use of mature, standardized technologies to reduce technical uncertainty. A robust testing strategy in representative operational conditions will be implemented. Contingency measures, including additional resources and fallback validation scenarios, will ensure that at minimum TRL6 is reached for core components while maintaining progress toward full hybrid capability.

PROJECT REVIEWS

Project Reviews

Grant Preparation (Reviews screen) — Enter the info.

Review No	Timing (month)	Location	Comments
RV1	21	Brussels (tbc)	

JU CONTRIBUTIONS

PIC	Legal Name	Membership	IKOP	Financial Contribution	IKAA
881850281	THE IRISH AIR NAVIGATION SERVICE	Yes (Founding Member)	€ 49 999.86	€ 0.00	€ 0.00
890100228	S.I.T.T.I. SPECIALE IMPIANTI TELESCRIVENTI TELEFONICI INTERNI SPA	No	€ 0.00	€ 0.00	€ 0.00
923671249	NAVIAIR	Yes (Founding Member)	€ 49 999.86	€ 0.00	€ 0.00
924128216	HRVATSKA KONTROLA ZRACNE PLOVIDBE DOO	Yes (Founding Member)	€ 49 998.90	€ 0.00	€ 0.00
928673636	DIRECTION DES SERVICES DE LA NAVIGATION AERIENNE	Yes (Founding Member)	€ 531 300.00	€ 0.00	€ 0.00
941767472	HUNGAROCONTROL MAGYAR LEGIFORGALMISZOLGALAT ZARTKORUEN MUKODO RESZVENYTARSASAG	Yes (Founding Member)	€ 39 378.57	€ 0.00	€ 0.00
942346077	LUFTFARTSVERKET	Yes (Founding Member)	€ 229 985.73	€ 0.00	€ 0.00
951375807	SOPRA STERIA GROUP	No	€ 0.00	€ 0.00	€ 0.00
955596471	NAVEGACAO AEREA DE PORTUGAL - NAV PORTUGAL EPE	Yes (Founding Member)	€ 49 998.83	€ 0.00	€ 0.00

PIC	Legal Name	Membership	IKOP	Financial Contribution	IKAA
996375756	ECOLE NATIONALE DE L AVIATION CIVILE	Yes (Founding Member)	€ 45 000.00	€ 0.00	€ 0.00
998956635	AUSTRO CONTROL OSTERREICHISCHE GESELLSCHAFT FUR ZIVILLUFTFAHRT MBH	Yes (Founding Member)	€ 49 839.75	€ 0.00	€ 0.00
999751938	THALES	Yes (Founding Member Affiliate)	€ 171 428.57	€ 0.00	€ 0.00
999961555	THALES LAS FRANCE SAS	Yes (Founding Member)	€ 7 695 992.83	€ 0.00	€ 0.00
999984447	THALES AVS FRANCE SAS	Yes (Founding Member Affiliate)	€ 1 006 425.51	€ 0.00	€ 0.00

Proposal template Part B: technical description

HAVEN

HIGHLY AUTOMATED AND VIRTUALISED ATS PLATFORM FOR EN-ROUTE & TMA OPERATIONS

#@APP-FORM-HERIAIA@#

Table 'History of changes'

Procedure: GAP		
Part A	**Section**	**Description of change and Reason/justification for change (if applicable)**
	Beneficiaries	THALES CORTAIX and ENAC have be added as new beneficiaries
	WPs	**No change**
	Deliverables	Some deliverables have been added as requested by SJU. Added deliverables: Initial STAND for SOL1 Initial REG SOL2 CDE (at M8) STAND SOL1 (at M20) REG SOL1 (at M8) REG SOL2 (at M8) CDE (at M20) STAND SOL1 (at M32) STAND SOL2 (at M32) REG SOL1 (at M32) REG SOL2 (at 32) TS/IRS SOL1(at M31) TS/IRS SOL2(at M31) Modified deliverables: Contextual Note SOL1 D2.1 (to be delivered M20) D3.1 Contextual Note SOL2 (to be delivered M20) D5.1 D6.1 (Contextual notes for both solutions) at M32 D4.2 CDE final moved to M34 D4.3 DMP final move to M34. Deliverables dissemination level have been updated to comply with the handbook requirements.
	Milestones	Some milestones have been added/adjusted as requested by SJU **Added milestones:**

		First PRM(M5), second PRM(M6), Maturity Gate (M9, M10), Open Days (M7, M8), Benefits Impact Mechanism M13, DP (M11, M12) **Modified milestones:** **M2, M3, M4** **Removed milestones:** **M1 (T0 – Grant Signature)** **M14: Integrated Validation Completed.**
	Risks	Added a risk related to Solution 2 not reaching TRL6 at the end of the project.
Part B	**Section**	**Description of change and Reason/justification for change (if applicable)**
	Section 1	Section 1.2 a clarification about EASA contribution and AI Roadmap 2.0 Compliance has been added Clarification of the contribution of each THALES entity to the validation's streams. Section 1.2: A statement has been added to plan a cross integration/validation activity with other WA3.1 projects.
	Section 2	The following statement has been added: The Consortium acknowledges the additional dissemination and exploitation obligations as set out under the call
	Section 3	Section 3.2 has been updated to include THALES CORTAIX Lab and ENAC, and also the expected contribution from EASA. AI-related considerations have been added in WP2 as part WP3 description updated to add an early task for SWIM baseline definition. WP 1 description has been updated to consider gender consideration in AI aspects.
	Gantt chart	Planning have been updated as requested by SJU to comply with the project handbook.

Table of Content

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

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

Edition 2025 of the European Masterplan (MP) identifies the transformation of en-route and TMA ground ATS platforms as one of the Industrial Research priorities for developing phase D of the Digital European Sky (Development Priority IR-3).

The objective of the HAVEN project, proposed under Work Area 3-1 of the SESAR 2025 IR call, is to contribute significantly to this Development Priority. As such, it aims at designing, prototyping and experimenting the next generation of ATS platforms to be implemented and deploying from 2030 onwards (DES phase D)

The project will address this objective along two main axes that are proposed to be organised as two SESAR Technological Solutions (according to the definition in SESAR 3 Project Handbook).

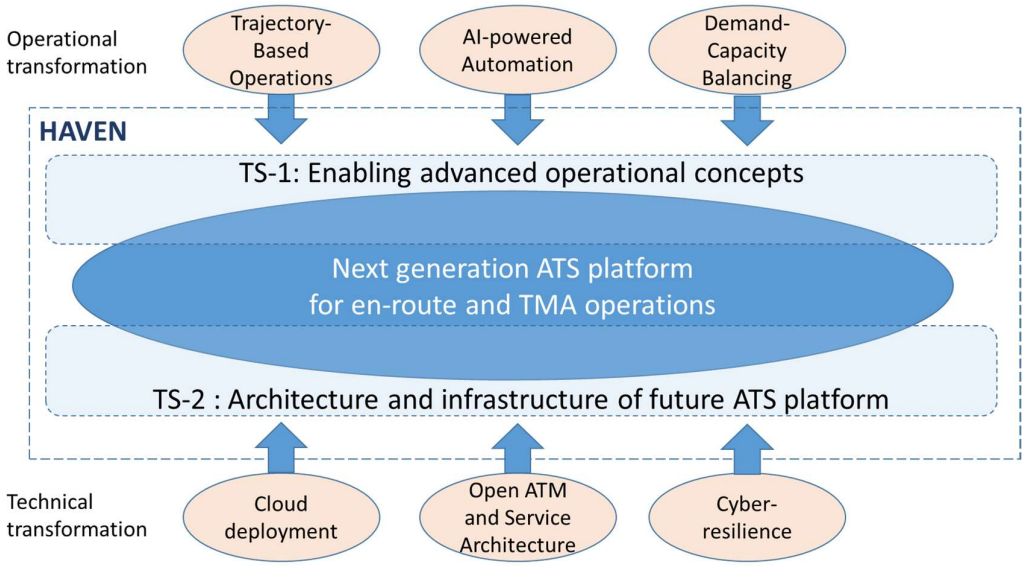
The first SESAR Technological Solution (**TS-1: "Enabling advanced operational concepts"**) will address the ATS platform transformation required to efficiently support the evolution of ATM operations expected as part of DES phase D. This includes the design, prototyping and experimentation of functional capabilities to support Trajectory-Based Operations (TBO) and Demand-Capacity Balancing (DCB) operational concepts (advancing MP development action IR-3-05). This will cover:

- The introduction of advanced automation in the ATS platform, enabling level 4 of the MP Automation roadmap ("Confined Automation"), and leveraging Artificial Intelligence techniques (advancing MP development actions IR-3-02 and IR-3-06) - including analysis and assessment of related human factors impacts.
- The introduction in the ATS platform of tools and services to optimise the operations in terms of environmental impact, as an enabler to environmental footprint reduction (advancing MP development action IR-3-07)
- The generalised usage of air/ground exchanges and synchronisation – extended / optimise used of CPDLC while keeping voice-comm as a backup and better integration of downlinked trajectory information (advancing MP development actions IR-3-01 and IR-1-01).
- The analysis and evaluation of future mechanisms supporting ATC-ATC exchanges.

The second SESAR Technological Solution (**TS-2: "Architecture and infrastructure of future ATS platform"**) will consider the technical capabilities needed to ensure full fledge flexibility, versatility, scalability and resilience of the ATS platform. Two main aspects will be addressed:

- Leveraging the New Service Delivery Model: how the implementation of the New Service Delivery Model (as per MP (SDO 8) can efficiently enable the ATS platform interoperability with third-party services, and interchangeability of services across platforms. The increased flexibility to introduce new/innovative services will also be addressed.
- Deploying ATM services in the cloud: how the next generation ATS platform, relying on a virtualised infrastructure and cloud-native architecture (as per MP SDO 6 and SDO 8) can be effectively deployed in and operated from the cloud.

On both aspects, TS-2 will assess and demonstrate technical feasibility, and analyse the pre-requisites and conditions to be fulfilled for the operational roll-out of the solution. This will encompass cyber-security risks analysis and mitigation recommendations/solution to ensure cyber-resilience, as well as potential standardisation and certification needs and impacts. TS-2 will advance MP development actions IR-3-01 and IR-3-03).



Structure of the HAVEN project – two SESAR Technological Solutions

For these two SESAR Technological Solutions, the general objective is to assess/confirm the feasibility of some key elements of the transformation required for the ATS platform to adequately and efficiently support the DES phase D expectations – both in terms of technical capabilities and in terms of pre-requisite for industrial implementation and operational deployment.

To fulfil this objective the project will define, prepare and run a number of operational and technical validation exercises, where target platform evolutions are prototyped and experimented through validation exercises, mainly based on Real-Time Simulation (RTS), and if relevant, live trial sessions. To ensure the proper level of realism and representativeness to these validation exercises, the project will use as baseline TopSky-ATC One, Thales industrial product for en-route and TMA Air Traffic Control, currently under development, built on the most recent technologies, and embedding the design patterns and capabilities required to support relevant MP SDOs. This baseline platform will be complemented with the prototyping capabilities offered by THALES LAS SkyLab environment, which has been used with success in several past SESAR projects.

In addition, the consortium brings together a complementary set of industrial and operational partners, each contributing specific expertise to the design, prototyping, and validation of advanced ATM solutions. THALES AVS complements this with its expertise in flight operations and AI, developing trajectory optimization algorithms and training models using operational data. COOPANS, DSNA, and HC contribute operational realism and validation expertise, ensuring representative and high-complexity airspace scenarios. SITTI supports the integration of advanced Voice Communication Systems, interfacing with ATC platforms, while SSG ensures the robustness and security of the digital infrastructure through scalable cloud platforms. Together, these partners enable the project to conduct realistic and representative validation exercises, targeting key technological readiness levels and supporting the evolution of European ATM systems.

Thanks to this setup, both TS-1 and TS-2 are planned to achieve TRL6 by then end of the project, from various elements with an initial maturity at TRL-4 and some TRL-2 (such as the aspects related to the introduction of Artificial Intelligence). Yet, as each solution covers several different elements – being operational concept elements or technical capabilities – it is possible that, during the execution of the project, the whole scope initially planned for the solution cannot be homogeneously assessed TRL6. In such case, as early as possible in the project schedule, the exact scope subject to TRL6 assessment will be identified, and the remainder managed aside of a lower-level assessment.

Whereas the objective of the project is ambitious, it remains achievable, as it relies on a platform baseline of very recent generation and powered with future-proof and cloud-ready technology, which represents a major initial step towards the DES phase D end goal.

The project will contribute to all five key transformation levers identified in the Master Plan: Trajectory optimisation, Automation, Dynamic airspace and the role of the human operators will be addressed as part of topics covered by solution TS-1; Data volumes, as well as the underlying New service delivery model, will be addressed in TS-2.

In addition, the table below describes how the project intends to fulfil the specific requirements defined in the WA3-1 call specification:

Call HORIZON-SESAR-2025-DES-IR02 WA3-1 Requirements **"*The targeted ATS platforms shall enable the following capabilities:*"**	**HAVEN**
Ensuring that all flights/missions (crewed or uncrewed) operate in a way that maximises, to the fullest extent, aircraft capabilities to reduce the overall climate impact of aviation (CO_2 and non-CO_2).	TS-1 will prototype and experiment features from the TBO concept (as defined in WA1-1 projects), that will contribute to trajectory optimisation vs environmental footprint. This encompasses optimisation related to User Defined Trajectory (UDT) and SID/STAR definition (addressed in TS-1 streams A & B)
Ensuring that each flight trajectory is optimised considering the individual performance characteristics of each aircraft, user preferences, real-time traffic, local circumstances, and meteorological conditions throughout the network. This optimisation shall be systematic, continuous (from planning to execution phase), and extremely precise.	TS-1 will prototype and experiment features from the TBO concept (as defined in WA1-1 projects), that will contribute to trajectory optimisation vs aircraft individual performance. In particular, this relates to UDT definition and execution. Moreover the alignment with the TBO operational concept defined in WA1-1 is expected to ensure the network optimisation of flight trajectories. (addressed in TS-1 streams A & B)
Potential conflicts between trajectories or traffic bottlenecks are resolved much earlier than today, bringing safety benefits.	TS-1 will build on TBO concept, which provide early deconfliction of traffic flows and flights. In addition, the ATS platform includes advanced deconfliction tools, and further develop automated conflicts resolution capabilities
Service providers can dynamically and collaboratively scale capacity up or down in line with demand by all airspace users. These capacity adjustments are implemented in real time and ensure optimal and efficient dual (both civil and military) use of resources at any moment across the network (airspace, data, infrastructure, and human-machine teaming).	TS-2 will address the feasibility and modality of a cloud deployment. Several use-cases will be assessed in the project, one of them being directly related to "automated load scalability", to ensure the adjustment of the required resources to the needs (up or down) (addressed in TS-1 streams A & B)
End-points, data connection and ecosystem (considering civil-military needs) are cybersecure thanks to the enhancement of information security such as, but not limited to, strong identification, authentication and integrity. Post-quantum cryptography (PQC) algorithms should be considered where appropriate. Research shall consider the on-going work by ICAO on the international aviation trust framework (IATF), which aims at developing standards and harmonised procedures for a digitally seamless sky and dependable information exchange between all parties.	Both solutions will encompass activities to assess the impact of the proposed platform evolutions on cyber-security – identification of risks and related mitigation measures. For TS-1, this will be in relation with the introduction of Artificial Intelligence as an enabler for reaching higher level of automation. For TS-2, this will be a core element of the work related to cloud deployment, as well as the work related to third-party services integration. All SWIM services developed/prototyped within the project will comply with the SWIM common public key infrastructure (PKI),

Call HORIZON-SESAR-2025-DES-IR02 WA3-1 Requirements "*The targeted ATS platforms shall enable the following capabilities:*"	HAVEN
The continuous optimisation of every flight/mission from gate to gate is systematically guaranteed thanks to high connectivity between air-ground and ground-ground components.	TS-1 will prototype and experiment elements of the TBO concept that heavily rely on air-ground interaction and integration. This will apply to all activities related to trajectory optimisation and synchronisation (addressed in TS-1 stream A)
The human operator is performing only the tasks that are too complex for automation to handle, teaming up with automation.	TS-1 encompasses a very comprehensive work aiming at increasing the level of automation provided by the ATS platform for ATCOs while keeping a human operator in the loop for monitoring and/or decision process. This will include the study and prototyping of a Digital Air Traffic Control module, capable of performing tasks in an autonomous mode TS-2 plans to involve ATSEPs in the assessment of deployment/architecture activities.
Voice communication is no longer the primary way of communicating and most routine tasks should be managed through machine-to-machine applications.	The solutions developed in the project rely on machine-to-machine communication, both for air-ground communication (both for controller-pilot dialogue and trajectory-reCortazixlated exchanges) and for ground-ground (including the study of next generation ATC-ATC exchanges). CPDLC supports pilot-controller dialogue, although complemented by other types of communication like Voice communication. Voice can be used for quick access situations, ensuring safe and effective controller–pilot interaction
To enable TBO Phase 3 in a highly automated ATM environment in accordance with the TBO and automation roadmaps in the ATM MP.	TS-1 include activities to prototype and evaluate automated tools and services in support to the TBO concept that will be defined in WA1-1. Automation will be developed up to level 4 of the MP Automation roadmap (addressed in TS-1 streams A & B)

#§PRJ-OBJ-PO§#

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

1.2.1. Overall project structure and common principles

SESAR Solutions

As stated in §1.1, two SESAR Technological Solutions are proposed in HAVEN project:

- TS-1: "Enabling advanced operational concepts"
- TS-2: "Architecture and infrastructure of future ATS platform"

These solutions are both focusing on the capabilities and performance of the ground ATS platforms enabling en-route and TMA operations, each solution having a specific point of view:

- TS-1 addresses the operational/functional capabilities of the ATS platform, and how these capabilities fulfil the expectations of the future ATM concepts (e.g. TBO, DCB, automation) and support the related operational benefits (capacity, flight efficiency, environmental impact reduction)
- TS-2 addresses the technical capabilities that will enable the transformation of the ATS platform towards the modern, data-driven & cloud-based service-oriented architecture envisaged by SDO 8 of the Master Plan.

Common methodology

For both solutions, the project will follow a similar validation methodology, including the following steps:

1. Identify the detailed scope of the research activity to be carried out, and define in detail the related state of the art and relevant input documents and information,
2. Derive detailed specifications for the targeted studies, including operational or technical use cases to be considered for validation, functional, technical and architectural requirements to be considered (as part of the solution Technical Specification – TS/IRS)
3. Prototype the required function/services, and integrate in the simulation environment
4. Define the validation process and objectives, required validation setup, configuration and scenarios (as part of the solution Technical Validation Plan – TVALP)
5. Run validation exercises according to the Technical Validation Plan, and report findings and recommendations as part of the Validation Report - TVALR), in relation with the validation objectives
6. Along with the previous steps, perform the required impact analysis, such as needs and recommendations for standardisation or regulation (feeding related reports, STAND and REG)

The project will rely mainly on Real Time Simulation (RTS) and if relevant, on Fast-time Simulations (FTS) or live trial sessions or the validation/demonstration of the feasibility, relevance and proper performance of the solutions. These validation activities will benefit from the realistic prototyping simulation environment (close to operational) offered by the coupling of TopSky-ATC One and SkyLab.

The validation approach defined above, and further detailed below for each Solution, only represents an initial view at the time of project proposal drafting. The validation roadmap will be further refined when executing the project.

Given the different scope and objectives of the two solutions in the project, the nature of the validation exercises will be different:

- TS-1 validation exercises will be mainly based on operational scenarios, played in simulated environment (airspace, traffic), and run in Human-In-the-Loop (HIL) mode with the participation of operators (Air Traffic Controllers), to evaluate the adequacy; efficiency and acceptability of the solution
- TS-2 validation exercises will be mainly prepared and run as technical demonstrations, to evaluate the feasibility and performance of the developed prototypes, and perform related impact assessment, e.g. with regards to cyber-security or certification.

To optimise the need for expert resources and validation platforms, when possible considering the topics to assess, validation sessions will be organised as “combined” sessions, where several different topics will be experimented using a common validation environment and scenario. The use of combined validation sessions will be clearly stated and described in the related documentation (TVAP, TVALR).

Dependency with other SESAR3 IR2 Work Areas/projects for TS-1

For solution TS-1, the goal is to define how the ATS platform can efficiently support future concepts of operation (TBO, DCB). The methodology described above is applied: the target operational concepts to be prototyped and validated are assumed to be part of the input material available.

The SESAR3 IR2 call foresees that specific project will work to define operational concepts and procedures that will impact the en-route & TMA platforms, and as such will be subject to prototyping and validation in WA3-1.

As an example, Work Area 1-1 will address the TBO aspects, and it is expected that the project(s) that will be granted in this WA, will develop a common operational concept that will be described in the SPR-INTEROP/OSED document(s) produced in this(ese) project(s). The HAVEN project will take these documents as an input for building its activities related to TBO (i.e., ATS platform support to TBO concept).

As the SESAR3 IR2 call structure gives the possibility to have several projects in WA3-1 working on different ATS platforms, this dependency between WA1-1 and WA3-1 ensures the consistency of TBO concept across the various ATS platforms and related projects.

General coordination principles have been defined and agreed between the coordinators of some projects proposals under WA1-1 and the coordinators of some projects proposed under WA3-1 (including HAVEN), as follows:

- The WA1-1 projects develop operational concept elements as part of an SPR-INTEROP/OSED, with a first version published early in the project (and possibly subject to further adjustments at later stage)
- The WA1-1 projects also draft a first version of VALP, defining high level validation objectives for the defined concept elements
- These two documents are taken as an input by the WA3-1 project (such as HAVEN) for building a detailed scope of activity, and for including relevant elements in its TVALP (detailed validation plan) and TS/IRS. This will also provide the details of the prototypes to be developed and validated.
- On this basis, the WA3-1 project will develop and run operational validation exercises centred on the ATS platform of the project and produce the corresponding TVALR.
- The TVALP, TS/IRS and TVALR will be delivered to the WA1-1 project for consolidation as part of its deliverables.

This approach should apply to all the topics address by solution TS-1, including TBO (both planning and tactical phases) and DCB.

In case the expected input documents (INTEROP/OSED, VALP) are not available in time, the partners of the HAVEN project will define sufficient assumptions, in terms of operational concepts and high-level validation objectives to perform the planned activities. It is considered that the HAVEN consortium includes the required expertise (ANSPs and industry suppliers having participated to relevant previous SESAR projects) to elaborate the needed elements. Such mitigation can apply, either because of delayed deliverables, but also in the case where a project expected to produce input information is not selected/granted.

Cross-projects (cross-platforms) activities for TS-2 (shared services)

As part of TS-2, the HAVEN project intends to demonstrate how the New Service Delivery Model defined in MP SDO 8 will enable the interoperability and interchangeability of standardised services across ATS platforms from different suppliers.

WA3-1 of SESAR3 IR2 call is scoped to accommodate several projects, each of them addressing a particular ATS platform solution. For the interoperability / interchangeability demonstration mentioned above, it is envisaged that the different projects selected and granted under WA3-1 will coordinate and agree on some service(s) subject to the demonstration. Each project involved will then:

- Provide an implementation of the selected service(s) to be consumed by the platform of other project(s) - including packaging as a SWIM service with proper API and published to the SWIM Registry
- Consume the service proposed by other project(s) as part of a validation exercise

The objective of this activity is to demonstrate that future *ATS platforms* can integrate Level 2 *ATM technical services* from different vendors without encountering any technical constraints. To achieve this, the activity will verify both interoperability (the ability of services to work together) and portability (the ability to deploy the same service on different ATS platforms). As part of the assessment, a Level 2 ATM technical service developed by another *WA3.1 Project* (*NATICA*) will be deployed on the *HAVEN* ATS platform and integrated with existing *HAVEN* ATM technical services using the agreed APIs and according to a predefined operational scenario. This will enable the verification of both interoperability and portability from the perspective of incorporating services provided by another *WA3.1 Project* (*NATICA*) to the *HAVEN* environment. Reversely, the *HAVEN* project will provide a similar ATM technical service to another *WA3.1 ATS Platform Project* (*NOMAD*). This reciprocal integration step will enable the same interoperability and portability tests from the opposite direction. Beyond the technical verification, this activity will contribute to a more complete definition of portability requirements for services and help to identify potential gaps in the current standard material.
The outcomes of these cross-integration activities will be documented and incorporated into the final versions of the TS/IRS and the Validation Report, serving both as a reference and as a template for future standardization work relating to Level 2 ATM technical services.

Scenario

- SC#2.1 — Integration of a Level 2 ATM technical service developed by another *WA3.1 Project* (*NATICA*) into the *HAVEN* ATS platform.
- SC#2.2 — Integration of a similar *HAVEN*-developed service into the ATS platform developed in another *WA3.1 Project* (*NOMAD*).

Note: In both scenarios, it is proposed to choose the STCA service as example of an ATM technical service.

Since this approach will be applied across all awarded WA3.1 projects, they will need conduct a coordinated planning process during the project alignment phase. This includes holding regular meetings in a coordinated forum to agree on the common work, facilitate discussions and further detail the validation approach. This coordination will ensure that integration steps, API specifications and validation criteria are jointly defined to enable consistent and reproducible cross-platform evaluations – going beyond the bilateral coordination that NATICA will conduct with its respective partners for the agreed validation exercises.

Disclaimer: Subject to available budget and timeline, HAVEN may on an optional basis and upon mutual agreement with the other *WA3.1 Projects*, arrange additional validations at service and IT platform level on a bilateral basis.

General approach to standardization and regulation

The "ATS platform for en-route and TMA operations" considered in the HAVEN project is subject to the new regulation (EU) 2023/1768 which lays down detailed rules for the conformity assessment of ATM/ANS Ground Equipment and focusing on the approval by a unique authority (the European Union Aviation Safety Agency - EASA) of safety critical equipment prior to their integration into an ANSP functional system.

At the time horizon targeted by the project (DES phase D), the transition period defined for this new regulation will be over, and the regulation will therefore be fully applicable. Consequently, most (if not all) "equipment" considered by the HAVEN project, will have to be certified before being deployed and used in operation. Depending on the criticality of the equipment, this will be done either via a "Certificate" delivered by EASA, via a "Declaration of Design Compliance" delivered by a Design or Production Organisation" (DPO), approved by EASA, or via a "Statement of Compliance" issued by the ANSP.

The HAVEN project intends to explore new technologies, new architectures and new environments deployment for ATC systems, which will represent novelties from a regulatory viewpoint. These novelties will require the development of new regulatory material and new standards to support their approval, as Acceptable Means of Compliance (AMC). Some on-going rulemaking and standardization activities may already tackle parts of those novelties, some others missing will have to be considered in the frame of the project with the contribution of EASA.

From the Technological Solutions planned to be addressed in the project, the following topics are particularly to be considered:

- Use of Artificial Intelligence to support higher level of automation - TS-1 (AI-powered Digital Assistant)

  The AI-powered Digital Assistant explored by HAVEN project provides a perfect opportunity to assess EASA's new regulatory material related to Artificial Intelligence, on a real and concrete use case as well as to test the formal procedure for certification/approval of AI. To date, Thales has been a key contributor and reviewer of EASA's AI Certification roadmap, and plays an active role in the industry working group 114. We intend to transfer our experience from this directly onto the design of our solution (e.g., we will follow the EASA guidelines around architectural isolation of AI components, assuring accurate and reproducible results, allowing mechanisms of human override and teaming, etc). Project HAVEN thus prepares for the certification against the upcoming EUROCAE standard ED-324 / ARP 6983 issue 1 dedicated to the introduction of Machine Learning models into the ATC domain and issue 2 which will address the Reinforcement Learning models into the ATC domain.

- Open architecture exposing and consuming services with standard API, as per MP SDO 8

  HAVEN project aims to provide a concrete example of SOA implementation with the possibility to be used as a reference step in the journey toward the final SOA target, that will contribute to the work of the on-going SOA@ATM taskforce launched by EASA in February 2025, to which Thales participates actively.

- Flexible deployment on various environments, from physical on premise to cloud

  Nowadays, recent ATM systems are using platforms implementing Cloud technologies but remain deployed on bare metal servers on customer premises. Moving toward cloud-based infrastructures is another objective promoted by SDO 8 and tackled by EASA SOA@ATM task force. It will raise challenges in terms of safety and

cyber-security that the HAVEN project aims to identify and assess to support the development of adequate regulatory material and standards to support the future approval of such solution.

As part of HAVEN, a service contract will be put in place with EASA, to ensure the participation of the Agency to the analysis and review of the project activities, and possible related recommendations.

To support future certification of the solutions proposed by HAVEN, evolution of standards will also be considered (new standards or updates of existing ones). In most cases, this will be coordinated with relevant stakeholders, possibly involving participants from different WA3-1 projects. The need for standards evolution will be as well coordinated with EUROCAE through the participation of HAVEN partners to EUROCAE instances (Council and Technical Advisory Committee).

Cybersecurity activities

Cybersecurity measures are essential to uphold safety goals against malicious acts targeting aviation, ensuring operational continuity and safeguarding the integrity, availability, and confidentiality of data and assets within ATM systems. Especially regarding the introduction of innovative operational concepts and their increasing connectivity, technical framework stacks (cloud), AI usage…

In Europe, certification processes include security validation as part of the DPO process and the Part IS regulation (EU) 2023/203. This primarily involves the organizations developing the systems, leading to product certification through an ISMS (Information Security Management System), similar to ISO 27001 but tailored to cybersecurity for safety aspects.

The Security Risk Assessment (SRA) of the product is central to ensure the system effectively mitigates identified cybersecurity threats. This SRA is developed in conjunction with safety assessments, complementing them with an attacker's perspective.

The following updates will have to be done in the SRA regarding the new operational concepts:

- Identify plausible cyber threat scenarios based on the new operational concepts that could affect data, information, and systems, and evaluate their impact on critical functions.
- Assess the likelihood and evaluate the possible impact on aviation safety, security, air navigation capacity and/or efficiency
- Assess the system's remaining vulnerabilities, accounting for existing mitigation measures.

Should the updated risk prove unacceptable, technical and/or organizational mitigations shall be suggested and possibly evaluated along with the solution.

Cyber threats to be considered shall include and not necessarily be limited to: (source ICAO Doc 10209): “Ransomware, Corruption of Aviation Data , Spoofing/Jamming of Global Navigation Satellite System (GNSS), Distributed Denial of Service (DDoS), Protection of Data Centers, Intrusion to Aviation Dedicated Airspace by UAS, Corruption of Meteorological (MET) Data, Corruption/Spoofing of Surveillance Data, Corruption of Flight Plan, Unavailability Internet Protocol (IP) Network for Aviation Operations, Unavailability of Flight Plan, Corruption/Spoofing of Instructions to Aircraft, Unavailability of Aircraft Systems (Aircraft Control or Airline Information Services Domains). Cloud specific threats are also to be considered, e.g. service exposure, native components usage.

Thales is also an active contributor of the on-going Trust Framework developed by ICAO TFP to ensure that the network of aviation stakeholders is able to securely exchange sensitive Air Traffic data in a trusted manner. The system shall ensure seamless compatibility with the principle described by the ICAO TFP manuals and instructions.

General principles

The solutions development will by default comply with the SESAR 3 JU Project Handbook Edition 02.00 as released in December 2024.

Accessibility of data/research outputs:

- Intellectual property rights are exclusively reserved to the members of the consortium. All members have full access to the content of project deliverables, during and after development.

- Copyrights are licensed to the SJU under conditions, dissemination of project results and deliverables being subject to owners' specific agreement. SJU members entitled with project coordination rights have full and open access to project deliverables' content.

Reusability of data/research outputs:

- Licenses for data sharing and re-use are granted exclusively based on the agreement of product owners.
- All consortium members participating to validation activities have open access to tools/software/models for data generation and validation/interpretation.

Interdisciplinarity within the project:

- As its main focus is the development and prototyping of the next generation of ATS platform, the project will mainly rely on the engineering expertise provided by the industry partners: system engineers, system and software architects, software developers, integrators and validators. Yet, the project will also rely on expertise related to safety, cyber-security, cloud environment, human factors, as well as the involvement of ATM operators, both Air Traffic Controllers (ATCO), and technical experts (ATSEP). Involving both industry partners and ANSPs, the HAVEN project will benefit from the full range of expertise required to fulfil its objectives.

Open science practices:

- All consortium members agree to adopt a collaborative working approach based on systematic sharing of knowledge and tools, limited to the scope of specific R&I activities. Sharing of knowledge is enabled by participation to team meetings, collaborative sharing, and review of deliverables, and sharing of intellectual products. Sharing of tools is subject to validation activities and is framed by the specific scope of validation.
- The overarching principle applicable throughout the application of open science practices is 'as open as possible, as closed as necessary', in line with each consortium member' relevant policies. In addition, 'Findability', 'Accessibility', 'Interoperability' and 'Reusability' principles are applied.

Gender dimension:

- The scope and content of the planned research and innovation activities do not address a specific gender category and has no gender-related impact.

Eventually, personal data might be collected and managed in accordance with GDPR Directive.

1.2.2. Solution TS-1: "Enabling advanced operational concepts" - Detailed methodology and plans

The work to be performed to achieve TS-1 objectives will be organised along three main streams of activity:

A. Higher level of automation and interoperability in support to ATC TBO concept
B. ATS platform contribution to Network TBO concept
C. ATS platform contribution to DCB

A. TS-1 - Higher level of automation and interoperability in support to ATC TBO concept

Focus area

This stream will focus on building the blueprint of a future ATM platform that autonomously controls traffic during en-route and approach phases of flights and ensures the efficient contribution of this ATM platform to the end-to-end TBO concept.

It will harness advanced AI and algorithms to provide safe separation and necessary traffic services on behalf of the human ATCO, thus reducing human ATCO workload and substantially increasing overall traffic capacity. Using real-time simulation, it will assess the technical feasibility and operational benefit of the overall automated solution and assess its impacts in terms of safety, cyber-security and certification.

The ATC TBO OSED document produced in WA1-1 will be a major input to this activity and will be managed according to the principles and assumptions described in §1.2.1 "Dependency with other SESAR3 IR2 Work Areas/projects for TS-1"

To provide the expected level of automation support to the TBO concept, the project will define, prototype and experiment a comprehensive suite of elementary automation modules which will cooperate under the supervision of

an overarching Digital Air Traffic Control module, in charge of the overall objectives. The target of this "Digital ATCO" will be to maintain safety, efficiency and orderliness, by continuously scanning, monitoring and planning for the airspace and traffic under its responsibility.

The Digital ATCO will contain the automated functions required to fulfil the top-down "goals" or strategy of the executive air traffic controller. That is, all the tasks involved in identifying traffic and maintaining situation awareness, and orchestrating actions that satisfy the goals of safety, efficiency and orderliness.

To do so, the Digital ATCO solution must, in sequence:

- assess the traffic in its area of responsibility: this will include scanning, planning, prioritizing actions to support the traffic in its sector(s).
- assess the relevant environmental and emerging conditions such as weather, airspace restrictions, etc. This may affect how the work is to be done, the timing of it, or indeed add new tasks.
- once the initial work is identified, orchestrate the work to be completed (this will be the job of the elementary tools described later).
- when the elementary work is complete, check the outcomes of the work against adjust the overarching plan if and as required.

Underneath the Digital ATCO, the elementary automation modules will address the lower-level tasks of air traffic control such as conflict detection and resolution, coordination, giving clearances, etc. The project plans to cover the following capabilities with dedicated elementary automation modules:

- conflict detection and resolution – an AI-based module that will identify and solve conflicts using reinforcement learning methods or other AI techniques
- weather avoidance– algorithms for avoiding infringements with actual or predicted weather events
- clearances - giving climb instructions, direct to, when ready descent, optimized approach paths, etc
- coordination– a module able to identify and execute the necessary messages to complete the standard coordination and transfer with the neighbouring sectors
- communication– a module capable to issue clearances, coordination messages, and answer pilot requests via CPDLC, voice or by AI-based speech recognition

The study will also consider how to enable effective takeover by the human ATCO, in case of automation limitations or failures, using most appropriate support for the situation and compliant with maximum ergonomic design principles.

In complement to automation in support to TBO concept elements, this stream will also address the future mechanism for ATC-ATC exchanges, that will ensure the sharing of tactical trajectory information as well as coordination data between adjacent ATC Centres, and with other interested systems, including NM systems, other ATC Centres, Military systems, etc. In the first phase the technological platform needs to be established based on open and service-oriented architecture and new data formats, in accordance with the ATM MP, to have a future proof and capable technology baseline. The new platform will support both present ATC-ATC exchanges and more advanced trajectory sharing. This future ATC-ATC exchanges service is expected to rely on following assumptions:

- It will complement FF-ICE services, as the channel for ATC-ATC coordination and transfer as well as tactical 4D trajectory exchanges
- It will rely on FIXM format (likely with payload extension) for the data exchanges, supported by SWIM Yellow Profile
- Publish/Subscribe methods will allow interested third-party systems to receive the flight information published by a given ATC Centre
- This new mechanism for ATC-ATC exchanges will coexist with OLDI for a transition period, but intends to ultimately replace OLDI

This ATC-ATC activity will be coordinated with the other WA3-1 projects granted, in order to ensure a common and interoperable solution. Coordination in a larger forum will also be setup, in order to ensure alignment with and feedback from the ANSPs and ground industry suppliers' community. Standardisation needs will be considered and

shared with relevant stakeholders (including EUROCAE). Following a phase of refinement of needs and specification, if agreement and consensus are reached, the project plans to develop prototypes to support some trials that will complement the planned operational validation exercises.

Context and assumptions

The work in this project extends on the previously developed automated CDR and CPDLC clearances solutions from SESAR3 IR1 ATC-TBO, and from the SESAR3 ER project DIALOG.

Extending from ATC TBO previous results, this project brings several aspects of novelty:

- the CDR resolver will be complemented by an AI-based conflict resolver, working alongside the "classical" conflict detection and resolution module (TRL6), including a weather avoidance capability
- proposed actions will cover more tasks than previously, including coordination, departure clearances, and AI-based approach path arrival clearances
- communication means will mainly rely on CPDLC automation, but still use voice as backup, supported by automated speech recognition
- the previously identified automation solutions will now be orchestrated under a fully autonomous control agent, responsible for satisfying the overall goals of safety, efficiency, and orderliness.

Planned activities

- Activity 1: Preparation of use cases, validation scenarios, and approach to safety. (documentation). This includes not only the development of initial concepts of usage, but also the approach to developing future features or aspects required to meet the evolving safety regulation for the introduction of AI and advanced technologies such as Reinforcement Learning.
- Activity 2: Development of software prototypes, integration and extension of sub-modules. (software)
- Activity 3: Validation exercise(s) through a real-time simulation with human Air Traffic Controllers, in various operational environments and traffic scenarios (documentation of validation exercise and evidence)

Validation platform

The study will utilize the SkyLab environment for prototyping and evaluating the solution with end users, in connection with TopSky-ATC One as baseline for the ATS platform background.

In support to voice-related activities, the SkyLab will be connected to SITTI Voice Communication System and to DSNA's Innovation platform, to enable access to two live external services:

- a speech recognition service (called Scribe, based on machine learning of voice transcriptions)
- a voice-based safety net service ("Cross Check") to check clearances are consistent with voice communications.

Validation objectives / scenarios

The study will deploy Real-Time Simulation sessions to Human-In-the-Loop evaluations involving ATCOs from the ANSPs partners, to validate the feasibility and benefits of the fully automated ATC solution in various airspaces and traffic conditions, and the behaviour and procedures to be applied in case of degradation. Scenarios will be defined with French, Swedish and Hungarian airspaces.

In the case the solution is fully automated, the validation exercises will possibly have the opportunity to run using accelerated simulation time.

Operational scenarios will be defined to illustrate relevant aspects of the targeted scope. Some aspects that will be addressed:

- Delegating a part of the traffic to the system, considering dynamic allocation of the delegated traffic (selective approach) according to criteria, e.g., low complexity, no conflict detected. Will also consider full auto-mode for selected flights.
- Transitioning back and forth between gradual (L3) and full (L4) automation: assessing the feasibility of full delegation to the system and testing the modalities for moving from this mode to reduced automation in specific conditions.

- Experimenting the feasibility of a more common and generalised use of CPDLC in TMA environment thanks to automation support, in connection with specific TMA tools (AMAN, Approach Spacing Tool).

Expected outcomes (KPAs)

- Capacity: the increased automation is expected to increase controller productivity and thus enable a greater sector and network capacity overall.
- Operational efficiency: the higher level of automation is expected to reduce ATCO workload and thus enable ANSPs to more easily cope with growing traffic in the future and with the potential shortage of highly skilled air traffic controller cohorts.
- Cost efficiency: increased task automation is expected to bring increased cost efficiency to the ANSP operating costs.

B. TS-1 – ATS platform contribution to Network TBO concept

Focus area

This stream will focus on two aspects of TBO at network level in planning and execution phases in liaison with concept development and validation threads proposed in WA 1.1 on UDT (Unconstrained Desired Trajectory) and trajectory update in execution phase (FF-ICE R2) solution.

To allow unconstrainted trajectories (UDT), it is important for ANSP to dynamically manage ATFCM/ATC constraints in pre-tactical and tactical to promote the best unconstrained airspace for Airspace users. It is also important for ANSP to follow the effect of constraints relaxation in execution phase in the demand and capacity management activities.

The project will propose a way to evaluate ATC constraints relaxations criteria in advance based on estimated traffic demand, to simulate the effect of constraints relaxations on the traffic demand, and to manage ATFCM/ATC constraints in relation with the Network Manager.

In the pursuit of greener and more efficient air traffic management, the project introduces the Green STAR initiative. This innovative solution optimizes Standard Terminal Arrival Routes (STARs) for arriving flights by dynamically allocating arrival routes as soon as possible, with a keen focus on reducing CO2 emissions, noise and improving local air quality.

The project will also address trajectory update on ANSP initiative in the context of FF-ICE R2 deployment in the ECAC area.

The project will work on a better data sharing between local traffic flow management tool and network manager system to enhance the use of STAM RRP services for flows instead of unique flight, and to improve the situation awareness of the FMP when several flight plans are updated in execution phase.

Context and assumptions

The project will build on the outcomes and findings of the SESAR3 IR1 NETWORK-TBO project, to which HAVEN partners contributed actively.

The project will also build on the outcomes of the SESAR3 IR1 CONCERTO project (led by Thales), adding features to the Constraint Orchestrator developed and experimented in this context.

Planned activities

- Activity 1: Review of the NETWORK TBO concept of operations produced by WA1-1. Define working assumptions in case the related project is not selected or late (cf. §1.2.1) Validation scenarios, and operational use cases (documentation).
- Activity 2: Development of software prototypes, integration and extension of sub-modules. (software)
- Activity 3: Validation exercise(s) through simulations with human Flow Manager actors, (documentation of validation exercise and evidence) and live trial for the constraint orchestrator validations.

Validation platform

This stream will use TopSky-Flow Manager tool platform as cloud-based platform for prototype developments and validation exercises interconnected with Network Manager validation platforms and B2B services.

The study will use the prototype of the Constraint Orchestrator for dynamic ATFCM/ATC constraints management support in validation exercises also connected with local traffic flow management tool and Network Manager platform.

Validation objectives

In UDT and dynamic ATFCM/ATC constraints project the validation objective is to demonstrate that ANSP can manage dynamically more constraints and that the constraints will be set up only when needed in their area of responsibility.

In FF-ICE R2 project, the main objective is to demonstrate that the data exchange in execution phases between ATM stakeholder will increase the situation awareness of the local FMP and then will help in capacity management.

Expected outcomes (KPAs)

- Safety – Ensuring that Network TBO operations maintain or improve the current levels of safety in ATM.
- Capacity & Efficiency – Increasing airspace and airport capacity, improving the efficiency of flight trajectories to reduce delays and congestion and
- Environment – Reducing the environmental impact by optimizing routes for fuel consumption and emissions by allowing airspace user to use optimal flight profile.
- Predictability – Enhancing the predictability of flight times and trajectories through better information sharing and trajectory management in planning and execution phase.
- Cost-Effectiveness – Lowering operational costs for airlines and ANSPs through more efficient operations by using only needed constraints

C. TS-1 - ATS platform contribution to DCB

Focus area

This stream will consider the following aspects of the Demand Capacity Balancing (DCB) concept:

- Complexity management

  Complexity management procedures are already in place at local level. The goal of the solution in the project is to enhance the complexity algorithm by adding operational feedback and actions to use more often complexity information DCB process like scenario or cherry-picking measures activation.

- Automatic scenario management

  Automatic scenario management is the local definition and implementation of local DCB solution scenario in liaison with Network Management scenario management procedures. The final goal is to integrate DAC measure like automatic sectorisation plans and rerouting scenario as DCB solution to resolve Demand Capacity Imbalances.

- Pre-TMA congestion prediction and detection – Advanced target time of arrival (TTA) coordination for out-of-area departures

  The project will introduce an innovative solution for predicting and detecting congestion before aircraft enter the Terminal Manoeuvring Area (TMA). This initiative focuses on advanced target time of arrival (TTA) coordination for out-of-area departures, aiming to mitigate congestion during the tactical phase of a flight. An Artificial Intelligence model will be trained with both historical data and real-time operational data to accurately forecast congestion events and enable traffic operators to take pre-emptive measures, ensuring smoother and more efficient air traffic flow.

Context and assumptions

In coordination with ATMOSPHER project in WA 3.1, using operational concepts for scenario management, the project will work on concept development and adaptation to project environment, operational use cases and workflow.

In this project, the coordination with Eurocontrol work made in ATMOSPHER is key to ensure the development of the solution in the European context.

Planned activities

- Activity 1: Review of the DCB concept of operation produced the project(s) defining the overall SESAR ATM Solution for DCB (OSED). Define working assumptions in case this project is not selected or late (cf. §1.2.1) on the production of validation scenarios, and operational use cases (documentation).
- Activity 2: Development of software prototypes, integration and extension of sub-modules. (software)
- Activity 3: Validation exercise(s) through simulations with human Flow Manager actors. (documentation of validation exercise and evidence)

Validation platform

This work stream will develop a set of services on top of TopSky-Flow Management and Constraint Orchestrator platform in a cloud-based environment, that will be evaluated in RTS-mode and shadow mode trial exercises.

Validation objectives

- To demonstrate that ANSP can better manage DCB issues by combining different kind of measures, and by using more accurate services and simulation environment.
- To demonstrate that local DCB process can use more automation in situation awareness for FMPs with a positive impact on the ANSP operation.

Expected outcomes (KPAs)

- Safety – Ensuring that DCB operations maintain or improve the current levels of safety in ATM.
- Capacity & Efficiency – Increasing airspace and airport capacity. Use available capacity by leveraging better ATFM measures and Scenarios.
- Cost-Effectiveness – Lowering operational costs for airlines and ANSPs through more efficient operations by using optimised sectorisation plans and scenarios, decreasing inefficiencies due to uncoordinated DCB measures (through integration of user needs, constraints, and information of all stakeholders in time).

1.2.3. Solution TS-2: "Architecture and infrastructure of future ATS platform" - Detailed methodology and plans

The work to be performed to achieve TS-2 objectives will be organised along two main streams of activity:

A. Leveraging Service Oriented Architecture for improved flexibility and interoperability
B. ATM in the cloud

A. TS-2 - Leveraging Service Oriented Architecture

Focus area

This stream will focus on the transformation of the ATS platform to an open architecture of packaged services with standardised interfaces and will aim at developing the benefits offered by this architecture in terms of flexibility and ease of evolution. Two axes will be considered:

1. Shared services and interchangeability

   Based on the service-oriented architecture defined as part of the Master Plan SDO 8, cross-projects validation exercises will be organised in WA3-1, involving the selected/granted and volunteer projects. It will be managed as described in §1.2.1 "Cross-projects (cross-platforms) activities for TS-2 (shared services)". A joint approach is proposed as defined hereafter.

   Next generation ATS platforms for En-Route and TMA operations will facilitate the implementation of this service-oriented, cloud-based model that will allow faster innovation, a higher degree of automation, and seamless integration of new services.

   To fulfil the ambition of SDO 8, a reference Level 2 (L2) architecture of services for ATM has been proposed in the document "Accelerating the implementation of a New Service Delivery Model for ATM in Europe" published

by the SJU in July 2025.

The proposed activity will focus on the common technical specification, implementation and validation at TRL 6 of (at least) one “L2 service” across the ATS platforms from different Industry providers.

The selection of the “L2 service” will need to consider the maturity and stability of the needed information (i.e. clear functionality, interfaces and non-functional requirements), the background deliverables from previous SESAR projects (e.g. Virtual Centre services definition) and the impact on the rest of ATM functionalities included in the ATS platform, so that we can ensure interoperability. Some possible examples for this initial “L2 service” implementation may include STCA, APW, MSAW, APM, AMAN, etc.

Different Industry implementations for the same “L2 service” will be delivered and integrated across different ATS platforms in order to ensure that the envisaged interoperability is actually achieved.

This activity will consider the delivery of the selected “L2 service” to be integrated within a typical ACC configuration with flexible deployment model, e.g., infrastructure as a service (IaaS), platform as a service (PaaS) or software as a service (SaaS).

The end goal of the validation of this activity is to demonstrate that there are no technical constraints when using L2 services from different vendors as part of future ATS platforms.

2. Introduction of innovative services

The purpose here is to demonstrate how the service-oriented architecture will facilitate the introduction of new and innovative services, enhancing the capabilities of the ATS platform.

The approach is to select a few such services that will be prototyped, published and consumed by the platform. Unlike the interchangeability experiment described in the previous paragraph, the services considered here will be prototyped and consumed within the HAVEN project.

The results and findings from this activity will be shared with the community with the goal to serve as basis for future definition of standardised services.

The following services will be experimented:

- Satellite Based Surveillance Service

  The purpose of this service is to seamlessly integrate Space-Based multi-lateration (MLAT) surveillance data into the ATS platform.

  The integration of the space-based MLAT surveillance as a service aims to ensure that this new data source is effectively ingested and processed by the ATC system, either as a standalone surveillance source or in conjunction with existing ground-based surveillance methods. By doing so, the project will validate the end-to-end process from space to the ATC system, demonstrating the feasibility and relevance of space-based MLAT integration.

- UTM integration service

  The purpose of this service is to support the coordination between Air Navigation Service Providers (ANSPs) and U-Space Service Providers (USSPs).

  The service will enable the activation and deactivation of dynamic airspace reconfiguration within the ATC system based on UTM information, ensuring that drone activities do not interfere with manned aircraft operations. The study will consider both fixed/predefined areas as well as dynamic zones.

  Based on the data provided, specific alerting can be developed (non-conform drone behaviour, presence of non-collaborative drone). The service will also provide information for the potential display of drones in selected areas.

- Civil/Military coordination service

  This service will support the exchanges of information between the ATS platform and military systems, such as Air Command, Control, Communications, Computers, and Intelligence (AirC4I).

  The work will include the definition of relevant use cases, including data to be exchanged, required performance and privacy, secrecy and security constraints.

  The service will enable the activation and deactivation of dynamic airspace reconfiguration within the ATC system based on UTM information, ensuring that drone activities do not interfere with manned aircraft

operations. The study will consider both fixed/predefined areas as well as dynamic zones. The detailed scoping of this activity will consider the relevant outcomes of the SESAR3 IR1 MITRANO project.

- Voice as a service (VaaS)

  The purpose of this service is to integrate voice communication features into the ATS platform to allow controllers to seamlessly access them as a cloud service from their controller working positions. This service aims at permitting ATCOs to access the voice management service being effectively integrated into the overall flight management framework. This will allow the validation of end-to-end transmission and reception of voice regulations, with the possible help of speech recognition based on machine learning. Use cases defined by EUROCAE WG126 will also be taken into consideration for implementation.

Context and assumptions

This work complies with the New Service Delivery Model approach, recommendations and reference architecture defined for Master Plan SDO 8. It benefits form the outcomes and findings of SESAR3 IR1 project CNS-DSP, which involves HAVEN partners.

Planned activities

- Activity 1: Define Technical use cases. The project will define the technical use cases to evaluate the reliability, performance, constraints and interfaces that will allow to validate the new deployment model that will leverage the objectives of SDO 8
- Activity 2: Design/Develop and Validate Prototypes. The project will design, develop, and validate prototypes in the context of the target ATS platform to support elements of the overall interchangeability and interoperability concepts. This will encompass both the creation/packaging of selected Yellow profile SWIM services with their publication via the SWIM Registry, and the adaptation of the ATS platform required to consume the services as published
- Activity 3: Run technical demonstrations. Technical validation scenarios will be executed with the ATS platform using the selected services, the behaviour and performance of the platform will be monitored and analysed.

Validation platform

TopSky-ATC One will be used as a baseline ATS for the introduction of the prototyped services. It will be activated in simulated mode or with recorded data for the purpose of technical demonstrations.

Demonstration of new/innovative services will benefit from external systems for interoperability purposes:
- TopSky – AstraUTM: external drome management system
- Skyview: external Military Command and Control system

Validation objectives

- To validate methods and techniques to derive shared / published services from existing functions and modules from state-of-the-art ATS platforms – analyse the needs in terms of software packaging and API definition.
- To demonstrate the feasibility to replace a given function / module from the ATS platform with published services from third party providers.

Expected outcomes (KPAs)

- Cost-Effectiveness – Reduced cost for the upgrade of ATS systems and for the introduction of additional functionalities
- Interoperability: improve operations thanks to improve collaboration between platforms and systems.

B. TS-2 – ATM in the cloud

Focus area

This stream will study the feasibility and benefits of various cloud deployment use cases for the en-route and TMA ATS platforms.

Building upon TopSky-ATC One as a state-of-the-art cloud-ready platform, the stream will experiment actual cloud

deployment conditions and constraints by:

- Enabling technical use cases that are planned to be delivered in DES phase D time-horizon,
- Identifying, designing and prototyping technical capabilities contributing to the realization of these use cases.
- Demonstrating specific operational use cases of interoperability between ATM systems, namely ATC and VCS systems on Cloud platforms

Harnessing technological assets (both commercial and developed), the target objective is to provide a flexible, scalable, resilient, and highly available ATM platform.

Through the deployment of such a platform, we will be able to define, design and assess:

- the impacts of operating such a platform in terms of safety qualification for an ATC system,
- the cyber-security assets leading to the certification of the system in such an environment,
- the performances requirements supporting an efficient ATC user experience.

As mentioned above, mandatory technical use cases have been identified as prerequisites for providing such a platform. The definition, implementation and validation of such use cases are the main activities for this stream (refer to the "Activities" section below for more details about use cases).

Context and assumptions

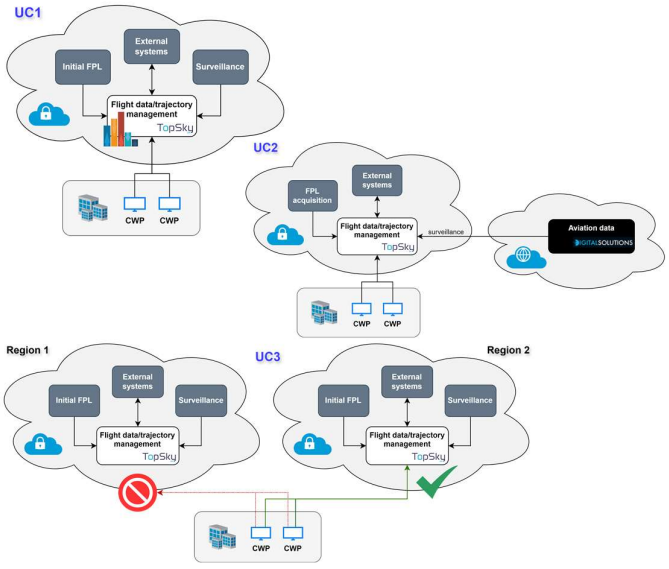
This work builds on the capabilities identified by Master Plan SDO 8 (Service-Oriented Delivery Model "cloud-based") and SDO 6 (Virtualisation of Operations). It also benefits from on-going SESAR projects related to virtual centre architecture: IR1 VITACY and DSD EXODUS led by COOPANS.

Planned activities

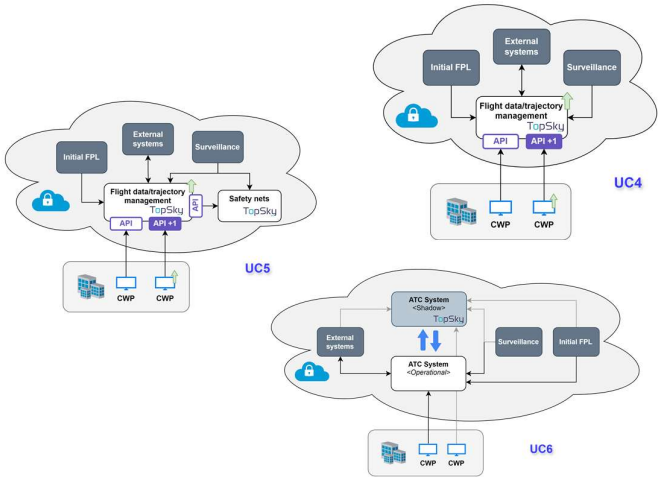
- Activity 1: Preparation of concept of operation, architecture, validation scenarios, and approach to safety and security (documentation).
- Activity 2: Development of software prototypes and pre-integration (software)
- Activity 3: Deployment of the prototype and integration (deployment & integration)
- Activity 4: Technical validation exercise(s) unrolling the different use cases (documentation of validation exercises and evidence provision)

During Phase 1 above, the use-cases to be experimented will be selected among the list below, according to an analysis of their criticality and priority:

- Technical Use Case #1 (UC1) – Automated load scalability: As an ATM service operator, I want the system to automatically increase or decrease computing power depending on the workload.
- Technical Use Case #2 (UC2) – Public/Private clouds operation: As an ATM service provider, I want the system to run operational segments on public and private cloud solutions.
- Technical Use Case #3 (UC3)– Disaster recovery: As an ATM service operator, I want the system to switch operations from one site to another leveraging on cloud solutions capabilities.



- Technical Use Case #4 (UC4) – Seamless upgrade: As an ATM service operator, I want the system to deploy a new version of the system with zero downtime.
- Technical Use Case #5 (UC5) – Partial upgrade: As an ATM service operator, I want the system to deploy a new version of a part of the system without deploying the unchanged parts.
- Technical Use Case #6 (UC6) – Shadow mode: As an ATM service operator, I want the system to be able to run as a passive operational segment.
- Technical Use Case #7 – Business continuity: As a technical supervisor, I want the system to provide reliable monitoring of critical business services.



For relevant Technical Use Cases above (Public/Private clouds operation), Thales and SITTI will extend the work of EUROCAE WG-126, currently defining the essential use cases for ATC and VCS systems interoperability.

Validation platform

TopSky-ATC One will be used as the baseline ATS platform for experimenting the cloud deployment use cases as described above. Thales will provide, adapt and deploy TopSky-ATC One for this purpose.

SSG and Thales will jointly setup and configure the cloud infrastructure and environment required to support the experiments.

Depending on the technical use-cases objective (refer to the "Activities" section below for more details about use cases), different topology of infrastructures may be used:

- Public cloud: Microsoft Azure Landing Zone hosting THALES LAS digital products.
- Private cloud: dedicated subscription(s) to cloud service provider(s): OVH, S3NS.
- Operational site: THALES LAS or DSNA premises.

SITTI will contribute to the HAVEN project by providing proprietary VCS solution, enhanced by functional interface with TopSky-ATC One, ensuring a complete functional coverage of the platform used for experimentation. SITTI proprietary SW applications will run on virtualized HW environment, co-existing with TopSky-ATC system within Thales OpenSky platform.

Validation objectives

The study will run several technical exercises to validate the core concepts of an ATC solution deployed in a cloud environment, each exercise targeting one or several of the use cases mentioned above. The exercises will be defined by the industry partners of the project (THALES LAS, SITTI and SSG) with the support of technical experts (ATSEP) from ANSP partners.

Expected outcomes (KPAs)

- Resilience: the capability of the system to run in shadow mode on different infrastructures with a powerful monitoring of its critical business services is expected to improve its resilience to disasters and major failures.
- Operational efficiency: the capability to seamlessly upgrade all or part of the system without any disruption of the ATC service is expected to increase the reactivity for fixing critical vulnerabilities or blocking issues, shortening outage downtime and decreasing the risk of intrusion.
- Cost efficiency and environmental impact: the capability of the system to adapt its need for computing resources is expected to bring increased cost efficiency and reduced environmental impact to ANSPs.
- Flexibility: the capability of the system to operate with services hosted on public or private clouds is expected to give flexibility to ANSPs in terms of deployment and to facilitate multivendor solutions.

1.2.4. Synthesis of the streams and validation activities

Technological Solution 1:

Stream	Topic	Validation method	Validation platform	Partners involved	TRL target
TS-1 – A ATC TBO concept	Automation – Digital ATCO	Real Time Simulation (RTS) running operational scenarios with expert operators (ATCO). Live Trial for relevant topics.	TopSky-ATC with SkyLab	THALES LAS ,THALES AVS, DSNA, HC, COOPANS, ENAC, THALES CORTAIX	TRL2 => TRL6 (4)**
	Automation – Elementary tools		TopSky-ATC with SkyLab & SITTI VCS	THALES LAS, DSNA, HC, COOPANS, SITTI	TRL4 => TRL6 (4)**
	ATC-ATC interoperability*		TopSky-ATC with SkyLab	THALES LAS, DSNA, HC, COOPANS	TRL2 => TRL6 (4)**
TS-1– B NETWORK TBO concept	Dynamic RAD		TopSky-ATC with TopSky-Flow	THALES LAS, DSNA	TRL4 => TRL6
	Green STAR		TopSky-ATC with Constraint Orchestrator	THALES LAS, DSNA	TRL4 => TRL6
TS-1 - C DCB	Complexity		TopSky-ATC with TopSky-Flow	THALES LAS, HC	TRL4 => TRL6
	Flexible Sectorization		TopSky-ATC with SkyLab,TopSky-Flow. SITTI VCS	THALES LAS, DSNA, HC, SITTI	TRL4 => TRL6
	TTA coordination		TopSky-ATC with Constraint Orchestrator	THALES LAS	TRL2 => TRL6 (4)**

** Pending on agreement and consensus are reached on a common solution*
*** "TRL4 (2)" means that the solution will build on several previous elements, some of them having reached TR4, others TRL2 only. "TRL6 (4)" means that the solution targets TRL6, but possibly with a reduced scope vs, the initial plan, as some elements will only achieve TRL4*

Technological Solution 2:

Stream	Topic	Validation method	Validation platform	Partners involved	TRL target
TS-2 – A SOA	Shared services	Real Time Simulation (RTS) supporting technical demonstrations Possible participation of ANSP technical experts (ATSEP)	TopSky-ATC	THALES LAS (cross-projects)	TRL4 => TRL6
	Innovative Services		TopSky-ATC with TopSky-Astra UTM, Skyview, SITTI VCS	THALES LAS, SITTI	TRL4 (2) => TRL6 (4)**
TS-2 – B ATM in the cloud	Selected use cases		TopSky-ATC with SITTI VCS	THALES LAS, SITTI, SSG, DSNA, HC	TRL4 (2) => TRL6 (4)**

*** "TRL4 (2)" means that the solution will build on several previous elements, some of them having reached TR4, others TRL2 only. "TRL6 (4)" means that the solution targets TRL6, but possibly with a reduced scope vs, the*

initial plan, as some elements will only achieve TRL4

1.3. State of the art

1.3.1. The HAVEN project is a major step towards DES phase D

The HAVEN project has ambitious objectives related to the transformation of ATS platforms for en-route and TMA operations, from their state-of-the-art status, towards fully digital, flexible and automated environment. This ambition vs the state of the art is detailed hereafter for the main focus areas of the project:

Higher level of automation

The project will build on the work from SESAR3 ER1 and IR1 projects (ATC TBO, DIALOG), and will complement the outcomes of these projects along two axes:

- The improvement of the suite of elementary tools available to support/replace specific operators' tasks
- The introduction and experimentation of a holistic Digital ATCO, as a virtual partner to the human operator, and orchestrating the elementary tools to ensure the allocated mission is optimally performed.

The project will bring a significant contribution to the question of the introduction of Artificial Intelligence to the ATM activities, with a focus on the aspects related to the execution phase of the traffic control. As such, it intends to provide valuable material to support the required standardisation and certification work.

Support to advanced operational concepts

TBO and DCB are core concepts of the ATM Master Plan, which involved all phases of flights and all ATM stakeholders to achieve end-to-end trajectory and airspace optimisation. SESAR3 IR2 intends to significantly advance these concepts as a coordinated work, building on the outcomes from SESAR3 IR1 projects, namely NETWORK TBO, ATC TBO, CONCERTO and HARMONIC.

The HAVEN project will ensure that the ATS platforms for en-route and TMA operations is developed to fully enable these concepts in the relevant phases of flight.

Leveraging Service-Oriented Architecture

Using the Master Plan New Service Delivery Model (SDO 8) as the state-of-the-art architecture for ATM platforms, the HAVEN project will further study the following aspects:

- The feasibility of designing and packaging shared services compliant with NSDM level 2 architecture, and of consuming in the ATS platform such service published by other suppliers (interchangeability demonstration)
- the possibility to rely on the NSDM as a framework to ease the introduction of new/innovative services, beyond the scope of the defined architecture.

ATM in the cloud

TopSky-ATC One is an advanced state-of-the-art example of ATS platform for en-route and TMA operations. As of today, it is based on OpenSky Platform, a cloud-native computing platform leveraging standard Kubernetes container management technology and complementing it to handle ATC specific safety and cybersecurity requirements. Yet, the first version of TopSky-ATC One, planned for transition to operation in 2028 in Europe, will reuse classical deployment patterns (on premise, fully provisioned HW infrastructure, bare metal deployment, full system reinstallation) to reduce impacts on system operations and associated safety concepts.

To ensure greater flexibility in the deployment of the platform in the future and get full benefits offered by the cloud technology, the HAVEN project will experiment various key use cases related to deployment. This further step is essential to progress the requirement in terms of performance, safety and cyber-security, as well as developing recommendations for certification.

1.3.2. Technical assets for the project

The HAVEN project will benefit from state-of-the-art technical assets, from research environment and prototypes to operated products, brought by the partners.

Asset	Provider	Description
TopSky-ATC One	THALES LAS	TopSky-ATC One is an advanced Air Traffic Control Automation System designed for Approach (APP) and En-Route mission (ACC) and provides Air Traffic Controllers with safe and easy to use system to perform: – Air Traffic Control (ATC) – Flight Information and Traffic Information services (FIS) – Search and Rescue alerting Service (SAR) – Tactical and Pre-tactical Flow Management TopSky-ATC One is implemented on the OpenSky cloud-ready platform (cf. below).
OpenSky platform	THALES LASTHALES LAS	OpenSky platform is a production grade Kubernetes cluster supporting different deployments: – Deployment on "bare metal", meaning that it is deployed directly (without virtualization layer) on the physical servers – Deployment on a cloud infrastructure. The Kubernetes services for container orchestration and workload execution are supplemented by other OSS (Open-Source Software) technical services which have been selected for provision of platform technical services (e.g., cluster wide Data Distribution, API Gateway/Proxy, Identity and Access Management, Load Balancer, etc.). The OpenSky platform is constructed with a collection of OSS packages and dedicated monitoring and control extensions which are integrated and validated for version compatibility and meeting global platform allocated safety and security objectives.
SkyLab prototyping environment	THALES LASTHALES LAS	SkyLab is the Thales integrated simulation facility targeting the evaluation of ATM components in a high-fidelity environment. It provides a cost-effective integrated solution for software component human in the loop evaluations. It interfaces with Thales industrial ATM solutions (TopSky-ATC and its components)
SITTI VCS solution	SITTI	SITTI will contribute to HAVEN project by providing proprietary VCS solution, enhanced by functional interface with TopSky-ATC system provided by Thales. From the deployment perspective, SITTI proprietary SW applications will run on virtualized HW environment, co-existing with TopSky-ATC system within Thales OpenSky platform.
Scribe, Cross Check	DSNA	Services provided by DSNA as part of their innovation platform for speech recognition experiments: – Scribe - speech recognition service based on machine learning of voice transcriptions – Cross Check: a voice-based safety net service to check clearances are consistent with voice communications.
TopSky – Flow	THALES LAS	TopSky – Flow is Thales' Air Traffic Flow Management solution, supporting ANSPs with better demand prediction to enable smarter flow management decisions. As a cloud-based application, it allows for higher levels of cybersecurity and application continuous updates, based on user feedback.
Constraints Orchestrator	THALES LAS	Constraint Orchestrator is a set of services built in CONCERTO project to manage a catalogue of measures and to evaluate ATFCM/ATC constraints criteria to provide automated support to users (e.g., local DCB actors, FOC operators, NM operators) with a set of proposals to optimise constraints (dynamic RADs)

Asset	Provider	Description
TopSky–AstraUTM	THALES LAS	TopSky – AstraUTM is a Thales cloud-native solution, accessible via web or mobile application, for drone traffic management, offering services for safe and scalable operations. It facilitates collaboration between drone operators, UTM operators, and authorities from planning to post-flight phases
Skyview	THALES LAS	Skyview is a state of the art, scalable, open architecture Command and Control solution for Air Operation C4I. SkyView is a proven & no risk turnkey AirC4I solution relying on Thales as a leading worldwide provider in 30+ countries (incl. NATO). SkyView platform provides easy integration of all types of sensors and effectors, supporting the self-resilience defence posture, cyber resilience, and advanced air operation applications for all users' missions.

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

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

2.1. Project's pathways towards impact

2.1.1. Target groups

The HAVEN project aims at defining an ambitious yet credible pathway for the transformation of ATS platforms for en-route and TMA operations, so that these platforms fully and efficiently play their role in the target Digital European Sky, as expected at the end of DES phase D.

The project being focused on ATS platforms for en-route and TMA operations, the core stakeholders groups targeted by the project's outcomes are:

- The ground ATM solutions suppliers, in charge of the industrialisation of the ATS platforms, their infrastructure, as well a related technical and functional services,
- The Air Navigation Services Providers (ANSP), in charge of deploying and operating these solutions, relying of both operational (ATCOs) and technical (ATSEP) staff.

Within these core target groups, three circles can be identified:

- The ground industry suppliers and ANSPs directly involved in the project

  As most of the activities planned in the project are based on Thales TopSky-ATC One, the features prototyped and experimented in the project, if the outcomes of the experiment proved successful in terms of feasibility, benefits and performance, will have a shortened path to industrialisation and delivery, as the environment used for the experiment is close to the industrial platform.

  The ANSPs part of the project (DSNA, COOPANS members, HC) will have the opportunity to familiarise with the evolutions addressed by the project, which will facilitate the adoption of these evolutions, both technical and operational.

- ANSPs part of the TopSky-ATC One users group (or candidate to be)

  TopSky-ATC One is managed as a single product driven by a common evolution roadmap shared with all its ANSP Users, with subscription to regular product upgrades according to this roadmap. The successful outcomes from HAVEN will naturally enrich the TopSky-ATC One roadmap. This will ensure that all current or future Users will benefit from these outcomes. The TopSky-ATC Users Groups regularly organised will support the required familiarisation. Most likely candidates include: skeyes, SMATSA, FinTraffic, EANS, ANS-CR, LPS-SR, HASP.

- Other ANSPs and ground industry suppliers

  The transformation envisaged to reach DES phase D includes a large amount of interoperability and

standardisation requirements. It is planned that the project selected under WA3-1 will coordinate closely to ensure the relevant topics are addressed in a consistent and homogeneous way, including:

- The development, publication and consumption of shared services aligned to NSDM taxonomy with standardised API
- The alignment on common operational concepts for network-level operations: TBO, DCB
- Extended data exchanges based on existing standards (for air-ground communication) or common recommendations and proposals for new/updated standards (for ATC-ATC exchanges).

Beyond the core target groups, HAVEN will have also an indirect impact on the larger ATM community, as it will focus on a brick of the whole ATM network optimisation target by DES phase D. This aspect is materialised in the project through the coordination with Work Areas/projects defining the end-to-end operational concepts for TBO and DCB. Technological Solution 1 (TS-1) shall ensure that the ATS platform for en-route and TMA operations provides the expected contribution to the overall ecosystem. This will ensure a network impact of the project, to stakeholder groups not directly involved in the project, such as Network Manager, Airspace Users, Airports, Military.

2.1.2. Contribution of HAVEN towards the outcomes specified in WA3-1 topic (a)(1)

As stated in the call specification, WA3-1 expected outcomes are to "significantly advance" most of the development actions from the Master Plan Industrial Research priority IR-3 "Future en-route and TMA ground platforms", as well as the development action IR-1-10 "Integrated air/ground trajectory management". The planned contribution of HAVEN to each of the listed development actions is as follows:

– **IR-3-01 Next generation ATC platform** addresses the next generation ATC platform, fully leveraging aircraft capabilities.

The outcomes of the two SESAR technological solutions developed in HAVEN will significantly contribute to the transformation of the ATC platform ensuring flexibility, scalability and resilience.
The use cases considered in TS-2 will ensure progress on services addressing interoperability with surveillance, UTM and Military external systems.

– **IR-3-02 Artificial intelligence** (AI) capabilities enabling the next generation platforms.

The introduction of Artificial Intelligence as a key enabler to higher level of automation is an essential focus of solution TS-1. The project aims at demonstrating the benefits and acceptability of full automation (the Digital ATCO approach) and its feasibility, both technically and regulatory. Outcomes of the study will allow the further deployment of automation Level 4 (Level 3A in EASA Roadmap 2.0) in operational environment.

– **IR-3-03 Cyber-resilience and cyber-security** capabilities enabling the next generation platforms.

Solution TS-2 will address the impacts of the open architecture of services and of the cloud deployment patterns on the cyber-security of the ATS platform. The recommendations and mitigations actions that will be produced are expected to provide an adequate way to guarantee the required level of cyber-security and resilience to operate the platforms.

– **IR-3-04 Separation management** for high levels of automation.

The work planned in TS-1 will include an activity dedicated to Conflicts Detection and Resolution (CDR), increasing the accuracy of detection and relevance of resolution proposals, thanks to 4D trajectory enhancement and Artificial Intelligence introduction. CDR activities have been initiated as part of the SESAR3 IR1 ATC TBO project. This CDR element, integrated as part of the automation tools coordinated by the target "Digital ATCO", will be an essential enabler for multi-criteria separation in the Level 4 automation environment.

– **IR-3-05 Demand capacity balancing (DCB) and airspace configuration** concepts for high levels of automation.

Part of TS-1 activities address the way the ATS platform will efficiently enable the DCB common operational concept. The outcomes of these activities are expected to provide flexible airspace management, with proper automation support, in the analysis and decision related to traffic complexity and evolution.

– **IR-3-06 Future human – machine teaming**.

It is planned that the work related to Digital ATCO and automation tools in TS-1 will provide significant findings and recommendations related to the human operators (ATCO) and the automated system, as long as from a human performance perspective. The aspect related to human-machines interactions in case of automation limitations or failure will be addressed.

– **IR-3-07 Ground capabilities for reducing ATM environmental footprint.**

The project will propose several improvements enabling the ATS platform to better support a reduction of the environmental impact of aviation. The work related to Digital ATCO will include environmental criteria as part of its decision-making processes. TS-1 activities will be dedicated to the prototyping and validation of elements of the TBO concept defined in WA-1 – the TBO concept encompasses the principle of trajectory optimisation for flight efficiency and reduction of environmental footprint. TS-1 also includes work on the Green STAR initiative, which aims at optimising arrival routes to reduce emissions. On a technical side, an objective of the TS-2 activities is to allow computing resources to be adapted to the needs of current operations. Overall, the implementation of HAVEN outcomes in operational ATM systems will be an important enabler to the reduction of ATM environmental footprint.

– **IR-1-01 Integrated air/ground trajectory management** based on ATS-B2

The outcomes of HAVEN will fully align with the overall TBO concept defined by WA1-1. The TBO concept relies heavily on the principle of integrated air/ground trajectory management. HAVEN will ensure that the ATS platform for en-route and TMA operations evolves to benefit from this integration. The experimental air/ground environment used within the project will provide all the features required to perform related validation activities.

2.1.3. Contribution of HAVEN towards wider impact (a)(2)

As stated in previous paragraph, the HAVEN project focuses on the transformation of the ATS platform for en-route and TMA operations, as expected by IR2 WA3-1.

The ATS platform is a central element of the complete ATM network, which includes numerous other elements, such as the Network Manager / Flow Management systems, the Tower control systems, the Airport Operation centres, the Airline Operation centres systems, the Military Air Operation centres, etc.

One of the main objectives of HAVEN, and in particular solution TS-1, is to ensure that the ATS platform evolves to fully and efficiently contribute to the holistic concepts targeted as part of DES phase D, such as TBO or DCB. This objective will be addressed thanks to a coordination with Work Areas / projects in IR2 that develop theses operational concepts (e.g., WA1-1 for TBO).

As a consequence, the outcomes of the project will enable the ATS platform to play a smooth and efficient role in the future overall ATM ecosystem, with a network-level contribution.

In addition, the work in TS-2 to demonstrate the feasibility of sharing services across platforms and of selecting various cloud-based deployment patterns, is expected to pave the way to a significant transformation of the ATM ground systems market, providing the technical enablers for further opening the way to the concept of ADSP (ATM Data Service Providers) decoupled from ATSP (Air Traffic Service Providers).

2.1.4. Scale and significance of the impact (b)

The expected level of contribution of the project to Key Performance Areas (KPA) is as follows:

– **Airspace Capacity** (en-route and TMA)

The project will ensure the efficient contribution of the ATS platform to the overall (end-to-end and gate-to-gate) TBO concept. As it focuses on the total ATM network optimisation of flight trajectories, TBO is expected to bring significant benefits in terms of airspace capacity. HAVEN will particularly contribute by introducing a high level of automation in the ATS platform, which will result in ATCO workload reduction, increasing the ATC productivity, allowing the handling of larger sectors with additional traffic.

Scale: Europe-wide, pending full TBO concept deployment. Local benefits expected earlier for TopSky-ATC Users (introduction of automation as part of the product roadmap)

Significance: Significant contribution

– **Environment** (fuel and CO_2)
  The TBO concept and related trajectory optimisation is planned to result in a reduction of fuel consumption, and therefore a reduction of emission.
  Scale: Europe-wide, pending full TBO concept deployment.
  Significance: Visible, yet limited. The overall impact of HAVEN remains limited as TBO contribution is mainly achieved in flight planning phase (before flight execution). In addition, TBO only addresses the impact of ATM operations. A significant part of environmental benefits in DES Phase D is linked to the use of alternative fuel (SAF)

– **Passenger time saving** (departure punctuality)
  The TBO concept intends to leverage the consolidation of 4D trajectory and impacting data (e.g. weather, other traffic), as well as the coordination between all contributing stakeholders, to provide the most accurate flight trajectory prediction. This will result in a significant increase in the predictability of flight schedule.
  Scale: Europe-wide, pending full TBO concept deployment.
  Significance: Visible, yet limited: the overall KPA relies on aspects that are not directly related to ATM, such as airport capacities like aircraft boarding, catering or luggage handling.

– **Cost-efficiency** (Air Navigation Services cost reduction)
  HAVEN is planned to contribute to the cost-efficiency via two axes. The first relates to the increased level of automation and the related improvement of ATC productivity. Increasing number of flights controlled per ATCO and increased the size of control sectors, as well as the opportunity to adjust the capacity to demand, is expected to reduce the ANSP staff costs, thanks to optimised workforce arrangements (outcomes of TS-1). The second relates the total cost of ownership of the ATS platform, thanks to the technical breakthrough of the capabilities related to shared services and cloud deployment: easier/faster deployments, upgrades and introduction of innovative solution, open market of services, infrastructure as a service, ...
  Significance: Very significant, as the project plans to provide improvement in both ANSPs' staff costs and equipment costs.

2.1.5. Requirements and potential barriers (c)

Some outcomes of the HAVEN project can be candidates to local implementation and bring initial benefits this way. For example, some elementary automation tools could be simply integrated in TopSky-ATC One roadmap with the agreement of related Users, and result in a local increase in productivity.

Still, this only represents a small part of expected HAVEN outcomes. Most of these outcomes depend on the availability of standards, regulation, certification process or pan-European implementation and deployment plans.

The main topics to be considered are:

- The introduction of Artificial Intelligence – safety impacts, social acceptability, certification needs
- The patterns for cloud deployment – safety, cyber-security, sovereignty, certification constraints
- The open architecture of services – standardisation (taxonomy and API), safety/cyber-security, certification process

In order to mitigate these potential barriers, the project plans to setup a number of coordination channels, to address the different aspects. Some are already initiated, but all will need to be confirmed and materialised when IR2 projects are granted. The channels should cover coordination with:

- WA1-1 projects: alignment on TBO concept
- EASA: certification aspects of AI introduction and cloud deployment
- Other WA3-1 projects: shared services approach and interchangeability experiment
- EUROCAE: standardisation needs and plans
- Relevant forum of ANSPs and ground industry suppliers: principles and common specification of future ATC-ATC interoperability.

2.2. Project Content towards Impact

As explained in §1.3, HAVEN project is bringing several innovations that will be considered novelties from a regulatory viewpoint. This means that some requirements, acceptable means of compliance, guidance material and standards are or maybe missing today to support their approval process and to provide the assurance that their potential impact in term of safety, cyber-security, performance and interoperability can been properly considered.

This is the reason why EASA will contribute to the HAVEN project in order to analyse and provide recommendations on the novelties. The expectation is to make sure the proposed solutions will be certifiable within the targeted period and to provide recommendations to reach this objective by:

- Identifying certification/regulatory risks and blocking points and supporting in defining how to address them
- Identifying potential needed updates in regulation to cover these recommendations and making the link with existing rulemaking tasks when relevant.

Beyond that, HAVEN project intent is to serve as a sandbox and to provide concrete use cases to support the current or to be launched rulemaking and standardization initiatives linked to the novelties it will bring.

The objective at the end of the project is to agree with EASA on the approval process and the anticipated attestation basis of the equipment.

It is anticipated that HAVEN project will impact the EASA Detailed Specification for Ground Equipment (DS-GE.CER/DEC). Before considering the update of these documents, EASA may first draft Special Conditions as usually done in Airborne domain to tackle novelties not covered by existing certification material.

For new standardization needs that could be identified by the project, it is proposed to draft the Term of References that could be used by the relevant SDO to develop the standard. EASA may contribute by reviewing and validating the draft ToR.

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

2.3.1. DEC Plan

Objectives of the DEC Plan.

The HAVEN Dissemination, Exploitation and Communication (DEC) plan aims at ensuring awareness, understanding and engagement among the stakeholder, whether they are operational or technical, across the ATM community.

Through the HAVEN project, several concepts and services will be verified and the DEC plan is there to facilitate the uptake of the validation results that will be produced. The operational users, such as ATCOs, ANSPs, but also technical implementers, such as ATSEP, system integrators or IT providers will have the ability to make use of these results in order to ease the definition of their own deployment plans.

The DEC plan supports the exploitation of the HAVEN project results by partners and all SESAR stakeholders for future industrialization and regulatory inputs. It aims at maximizing the HAVEN project's visibility and contribution to SESAR3 JU strategic goals and Digital European Sky Objectives.

The consortium commits to delivering a communications and dissemination plan in accordance with the SESAR Project Handbook as a formal deliverable within six months of the signature of the grant agreement.

The Consortium acknowledges the additional dissemination and exploitation obligations as set out under the call.

Target audience

Segment	Description	Relation to Project
Operational Stakeholders	ANSPs, ATCOs, airports, military users	Direct users of the validated concepts
Technical Stakeholders	System manufacturers, IT providers, cloud architects	Implementers of new service delivery models
SESAR Community	SESAR JU, SJU project partners, S3IR2 beneficiaries	Alignment and cross-fertilisation
Regulators	EASA, EUROCONTROL	Standardisation and regulation of architectures
Wider Public	General public, students, media	Raising awareness of EU investments in ATM innovation

2.3.2. Dissemination

Dissemination Strategy

Dissemination ensures results reach those who can further develop, use, or benefit from them. All dissemination actions will demonstrate and showcase how HAVEN contributes to the ATM Master Plan implementation topics.

The publications will explicitly refer to actions and results regarding the development actions from the Master Plan Industrial Research priorities that it covers.

The HAVEN project will be mentioned during recurring events where THALES LAS regularly participates or acts as a sponsor, such as ASW Lisbon, IFATCA, IFATSEA, CANSO regional conferences, SESAR events, FlyAI and Thales Users conferences (Better Skies Together). It will be highlighted through conference sessions, booth presence, and speaking opportunities, integrated into THALES LAS key messages and communications.

The project HAVEN will have a dedicated website that will include a dedicated section linking the project's outputs to the ATM Master Plan goals (e.g., environmental sustainability, digitalisation, resilience).

Channels and Tools

Tool	Description	Timeline
Public Website	Project info, news, deliverables, demos	T0+4 month, and continuous updates along the project
Publications	Peer-reviewed papers, conference papers	T0+16 month onwards
Workshops & Webinars	For ATCOs, technical users, SJU partners	1 ops-focused, 1 tech-focused per year
SESAR Innovation Days	Presentations, posters	Annually
Other international events	e.g., ASW Lisbon, IFATCA, IFATSEA, CANSO regional conferences, SESAR events, FlyAI and Better Skies Together	Annually
LinkedIn/X posts	Regular updates, infographics	Monthly

During the SESAR Innovation Days the presentation will refer to the relevant Master Plan Threads and Elements, in particular the ones related to the Infrastructure and Service delivery themes.

Dissemination Activities by Solution

SESAR Technological Solution #1: Operational Validation of automation Tools will be performed with the contribution of ATCOs.
- Demo sessions with ATCOs will be recorded for à posteriori analysis
- SESAR Validation Exercises will be integrated
- Dissemination via EUROCONTROL and ATCO unions

SESAR Technological Solution #2: Technical Architecture Validation demonstrating the new service delivery and the Cloud deployment capacity.
- Technical white paper on cloud performance and cyber/safety/security impacts will be produced
- Dissemination through ATM architecture working groups, e.g. ECTL NM, EASA

2.3.3. Exploitation

This exploitation strategy aims to ensure sustainability and impact of results after project end. The HAVEN project technological solutions rely on the TopSky-ATC One product. It is based on a core solution which has already been developed, and it is complemented with state-of-the-art features which are necessary to comply with the latest international regulations and the development axes of the ATM Master Plan.

The TopSky-ATC One is the new product generation for AMS en-route & approach air traffic control center. It is intended to be offered on a worldwide base as a service-oriented product gathering support and system evolutions through a strong and customer inclusive roadmap governance.

TopSky ATC One v2.3 is committed to be delivered to European (COOPANS, skeyes, HC, SMATSA) and non-European (CAAS, Airservices) customers in 2027 and planned to be in operation in 2028.

Incremental features are defined in a product roadmap agreed with strategic partners aiming at achieving higher levels

of automation, operational efficiency and sustainability after 2029, including further improvements in terms of openness and conformance to IT standards.

Even though the results of the HAVEN project will directly serve the benefit of the TopSky-ATC One solution and its customers, they need to be consistent with other solutions available on the market. Standardisation groups will be put in place, with the contribution of EUROCAE, EASA, ASD for instance, to share and align targets and results with other solution providers.

Key Exploitable Results by solution

Result	Exploitation Path
SESAR Technological Solution #1: "Enabling advanced operational concepts"	
Advanced automation in the ATS platform	Enabling level 4 of the MP Automation roadmap ("Confined Automation") Leveraging Artificial Intelligence techniques (advancing MP development actions IR-3-02 and IR-3-06)
Tools and services	Optimise the operations in terms of environmental impact, as an enabler to environmental footprint reduction (advancing MP development action IR-3-07)
Air/ground exchanges and synchronisation – extended / optimise used of CPDLC while keeping voice-comm as a backup and better integration of downlinked trajectory information	Advancing MP development actions IR-3-01 and IR-1-01
SESAR Technological Solution #2 "Architecture and infrastructure of future ATS platform"	
New Service Delivery Model	How the implementation of the New Service Delivery Model (as per MP (SDO 8) can efficiently enable the ATS platform interoperability with third-party services, and interchangeability of services across platforms. Increased flexibility to introduce new/innovative services will also be addressed.
Deploying ATM services in the cloud	How the next generation ATS platform, relying on a virtualised infrastructure and cloud-native architecture (as per MP SDO 6 and SDO 8) can be effectively deployed in and operated from the cloud.

2.3.4. Communication

Communication aims to increase awareness and provide broad support beyond specialists. As the project's two technological solutions strive to reach TRL6 maturity, engaging those responsible for implementation is crucial to smooth the transition towards TRL3 and TRL4 , especially for ATM Solution #2, given its potential harmonization impact.

Regularly presenting HAVEN Solutions' results to key industrial and operational stakeholder groups is an effective way to reach this audience.

Moreover, due to the project's close ties with standardization activities, regular communication with regulatory groups is essential. This will involve distributing papers, giving presentations, and participating in technical meetings as a SESAR technical representative.

An advisory board will be set up to consult stakeholders not part of the consortium, including some airspace users. This board will meet periodically to provide input, suggestions, and feedback on the project's interim and final results, as well as offer expertise on project strategy and developments.

The list of advisory board participants will be established at the project's outset, drawn from organizations within HAVEN's target audience that have expressed interest.

Key Messages

The main messages that are targeted to be communicated on for the purpose of sharing the HAVEN project progress and findings are the followings:

– Main contribution to Digital European Sky and SESAR 3 JU goals through the coverage of the development

priorities from the phase D of the deployment plan as per the ATM Master plan
- Organisation and results of the validation of real-world operational concepts with the targeted user group
- Findings related to the enablement of cloud-based ATM services as per the new service delivery model framework

Communication Activities

Activity	Description	Target
Project Branding	Logo, templates, press kit	All stakeholders
Social Media Campaign	Creating a LinkedIn site and publishing posts on key events and news related to the project	General public & professionals
Press Releases	Publishing articles via the SESAR e-news and as in-house articles in the partner publications.	EU/international ATM media
Demo Days	Hosting visitors and webinars with the impacted target groups for key events, e.g., validation exercise open days.	Public + stakeholders

2.3.5. Intellectual Property Rights (IPR) management

At the beginning of the project, an appropriate consortium agreement, in which each partners identifies the background technologies and assets (patents, publications...) brought in the project with the related IPR management, shall be defined. This agreement shall also describe the rules for the use and exploitation of a given partner's background and projects results. As a general principle, all results related to a development executed in the project belongs to the entity(ies) investing for it unless specifically mentioned. Results will be indicated in the results ownership list by the end of the project.

#§COM-DIS-VIS-CDV§#

2.4. Summary

KEY ELEMENT OF THE IMPACT SECTION

SPECIFIC NEEDS	EXPECTED RESULTS	D & E & C MEASURES
What are the specific needs that triggered this project?	*What do you expect to generate by the end of the project?*	*What dissemination, exploitation and communication measures will you apply to the results?*
The legacy ATS platforms for en-route and TMA operations are considered unable to answer to the challenges arising from DES phase D, due to: - The limited level of automation support they provide, as they still strongly require human operations – which prevents significant capacity and productivity increase, and limits the benefits from the increased amount of data available (4D trajectory, air/ground synchronisation, enhanced interoperability) - Their monolithic software architecture, still relying mostly on proprietary interfaces – which slows down the introduction of innovative solutions and increase the cost of ownership These needs mostly relate to the ATM Master Plan development priority IR-3 “Future en-route and TMA ground platforms”.	The objective of the HAVEN project is to produce two SESAR Technological Solutions enabling the transformation of ATS platforms for en-route and TMA operations from current state-of-the-art technology and functionality into fully digitalised and highly automated systems. The first Solution (TS-1) considers a very high level of automation to handle the ATS platform operations, through the introduction of an AI-powered Digital ATCO, orchestrating elementary tools supporting the advanced operational concepts (TBO, DCB, A/G integration, ATC-ATC interoperability) The second Solution (TS-2) considers how service-oriented architecture as defined by the New Service Delivery Model (NSDM) and cloud-ready infrastructure can be leveraged to provide a high level of flexibility, efficiency and resilience. For each Solution, the project will define a complete data pack, including specifications, validation objectives, plans and results, as well as standardisation and regulatory needs and impacts.	**The HAVEN DEC plan** aims to ensure awareness, understanding, and engagement among ATM stakeholders to facilitate the uptake of validation results and maximize the project's visibility and contribution to SESAR3 goals. **The HAVEN dissemination strategy** aims to showcase the project's contributions to the ATM Master Plan through various channels, including a dedicated website, publications, workshops, and international events, targeting both operational and technical stakeholders. **The HAVEN exploitation strategy** ensures the sustainability and impact of project results by integrating them into the TopSky-ATC One product, aligning with international regulations and the ATM Master Plan, and collaborating with standardisation groups to maintain consistency with other market solutions. **The HAVEN communication strategy** aims to increase awareness and support by regularly engaging key stakeholders, collaborating with regulatory groups, and sharing project progress and findings through various channels, including social media, press releases, and demo days.

TARGET GROUPS

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

The project being focused on ATS platforms for en-route and TMA operations, the core stakeholders groups targeted by the project's outcomes are:

- The ground ATM solutions suppliers,
- The Air Navigation Services Providers (ANSP), and their operational (ATCOs) and technical (ATSEP) staff.

Due to network effect, the modernisation of ATS platforms will contribute to wider benefits linked to the deployment of holistic concepts such as TBO, which will benefit to other stakeholders, including the Network Manager, Airspace Users, Airport operators, Military, and passengers.

OUTCOMES

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

The objective of the HAVEN project is to significantly advance the ATS platforms for en-route and TMA operations to meet the objectives of DES phase D – both in terms of operational capabilities, with the support of AI-powered automation, and in terms of technical capabilities to provide the flexibility enabled by open service-oriented architecture and cloud technology.

Successful completion of the project will provide mature solutions available for the transformation of the ATS platforms. At first stage for those platforms directly involved in the project activities (prototyping and validation) and developed by HAVEN partners, but on a larger scale, to ATS platforms from other suppliers, thanks to the published Technical Specifications, and standardisation work.

This will include new AI-based decision tools to support TBO and DCB operations in highly integrated air-ground environment, cyber-resilient patterns for cloud-based deployment and services interchange.

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?

The ATS platform is a central element of the complete ATM network, which includes numerous other elements, such as the Network Manager / Flow Management systems, the Tower control systems, the Airport Operation centres, the Airline Operation centres systems, the Military Air Operation centres, etc.

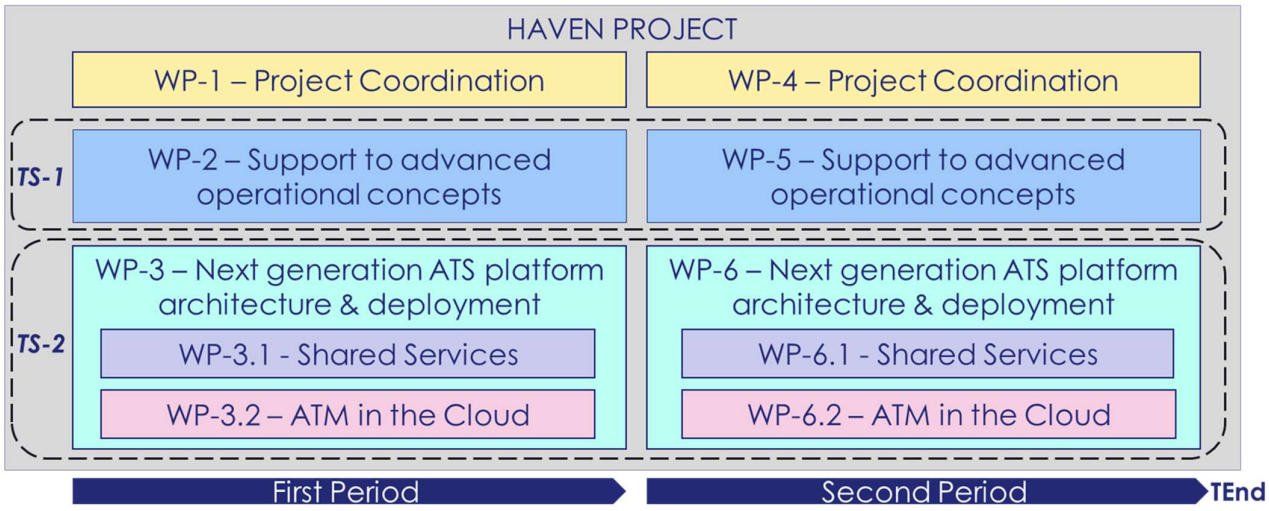
One of the main objectives of HAVEN, and in particular solution TS-1, is to ensure that the ATS platform evolves to fully and efficiently contribute to the holistic concepts targeted as part of DES phase D, such as TBO or DCB.

As a consequence, the outcomes of the project will enable the ATS platform to play a smooth and efficient role in the future overall ATM ecosystem, with a network-level contribution.
In addition, the work in TS-2 to demonstrate the feasibility of sharing services across platforms and of selecting various cloud-based deployment patterns, is expected to pave the way to a significant transformation of the ATM ground systems market, providing the technical enablers for further opening the way to the concept of ADSP (ATM Data Service Providers) decoupled from ATSP (Air Traffic Service Providers).

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

3.1. Work plan and resources

The Project is divided into 2 technological solution and 6 different work packages (including Project Management); each split into a certain number of activities and to a certain extent, coordinated independently by its Solution project manager. The project structure is displayed in the figure here below:



The project management and structure are aligned with the SESAR project handbook (revision 02.00, 19 December 2024) to ensure delivering SESAR Solutions at the required quality/ maturity levels, respecting the ATM Master Plan objectives, and fulfilling SESAR 3 JU reporting obligation. The maturity level achieved by a SESAR Solution, is defined in accordance with the Technology Readiness Level scheme (TRL).

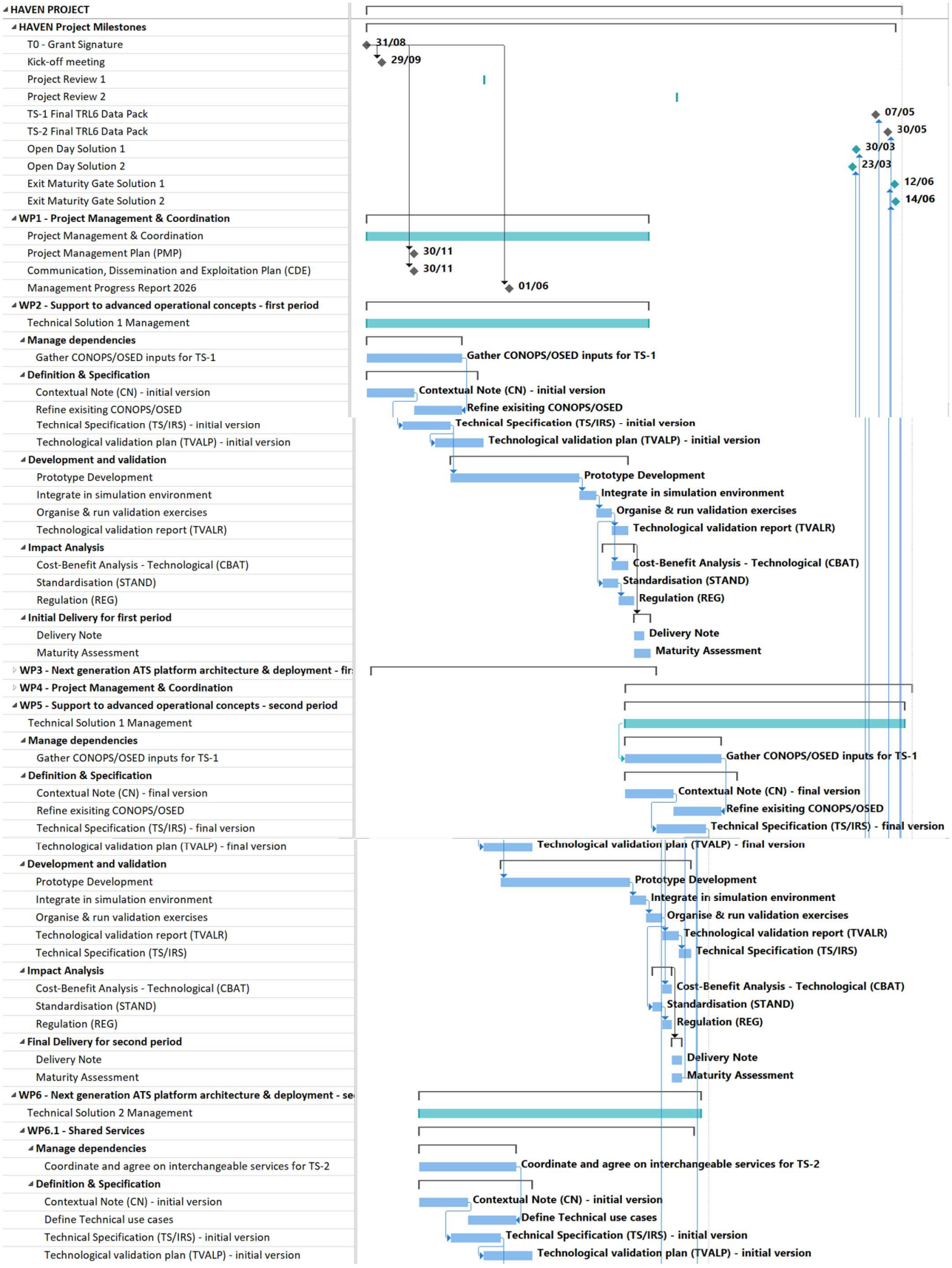
THALES LAS is the Project Manager (PM). He acts as the Specific Grant Agreement coordinator in contact with the SESAR Joint Undertaking (SJU) and is responsible for the day-to-day monitoring and control of project progress with respect to project objectives, timetable and acceptance of deliverables.

The project will respect guidance for the industrial research data pack deliverables: Contextual Note; TS/IRS; TVALP; TVALR; CBAT; STAND; REG, as described in the SESAR3 Project. Handbook.

THALES LAS is also the leader for the Two Technological Solution #1 and #2 and is responsible for the operational technical leading of the solution, and the overall management of related validation activities.

Furthermore, detailed role and responsibilities are described in the Project Management Plan (PMP).

The Gantt chart hereafter provides an overall project view:



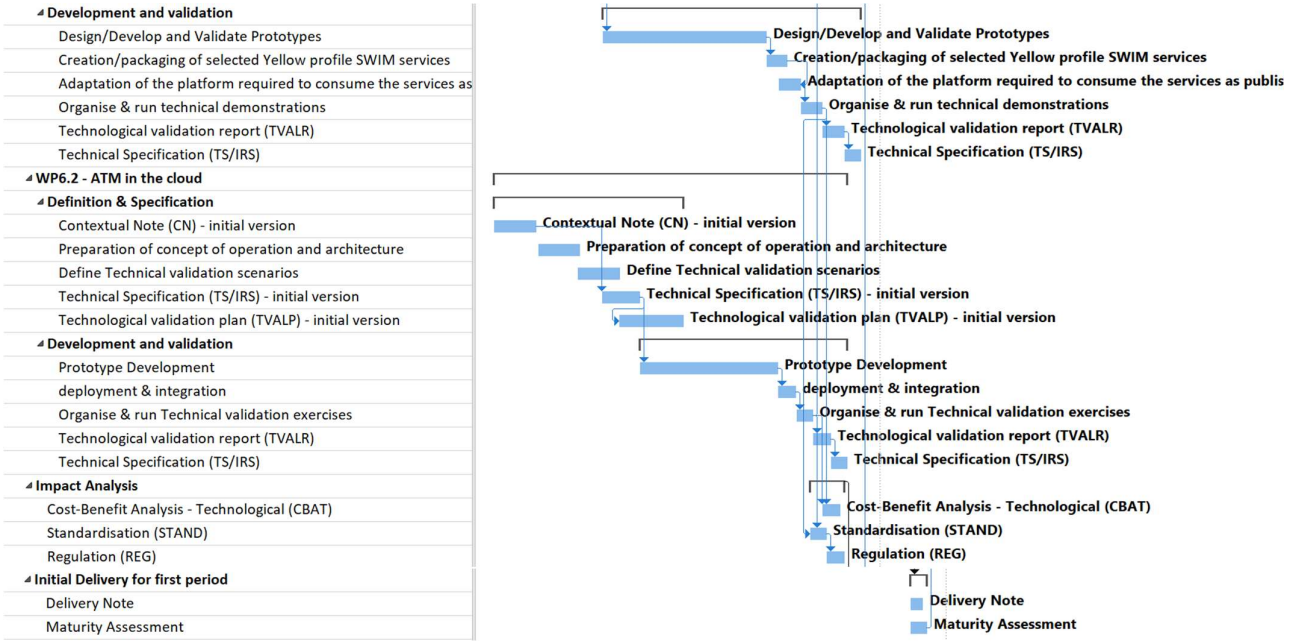


Table 3.1 a 'Subcontracting costs' items

Subcontracting	Cost (€)	Description of tasks and justification
DSNA - **Human factors expertise**	220 000.00 €	Advanced human factors expertise contributing to the design of User eXperience/User Interface (WP2) and observation of Validation EXEs involving ATCOs (WP5)
DSNA **ATM engineering** expertise	206 000.00 €	Advanced ATM engineering expertise needed to contribute to the validation objectives setup and assessment (WP2 and WP5), next generation ATS platform architecture from ATM data service/IT cloud perspective (WP3) and technical EXEs (WP6)
DSNA - cost benefit analyst	10 000.00 €	Support to CBA analysis for DSNA (WP2) and CBAT (WP5)
LFV COOPANS	99 000.00 €	Key Operational Expert with knowledge in ATM system design, knowledge in ATM rules & regulations, operational experience, and experience from precious similar SESAR projects. The subcontractor will contribute to WP2 and WP5 and will play a central role in the development phase and validation phase of the project.

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

Table 3.1 i is not applicable to the HAVEN project

Table 3.1 c 'In-kind contributions' provided by third parties

Table 3.1 j is not applicable to the HAVEN project

#§QUA-LIT-QL§# #§WRK-PLA-WP§#

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

The HAVEN consortium is composed of 8 air navigation service providers and 5 industry partners. The ANSPs are DSNA, COOPANS (NAVIAIR, LFV, ACG, CCL, AIR NAV IRELAND, NAV PORTUGAL) and HC, and the industry partners are SITTI, SSG, THALES AVS, THALES LAS, THALES CORTAIX and the university ENAC.

The consortium was meticulously chosen based on the necessary skills and experiences to execute the proposed work. The practical know-how, vital for both the conceptualization and implementation stages of the Project, is well-represented by the inclusion of end-user organizations. The work is designed to be highly collaborative across all work packages, facilitating the exchange of knowledge and expertise among all participants.

The objective of Solutions #1 is to validate the needed ATS platform transformation to support the evolution of ATM operations expected as part of DES phase D of the MP by advancing development actions related to the IR-3 and IR-1. It comprises the introduction of artificial intelligence techniques to support capabilities such as TBO, DCB and conflict resolution to a TRL6/V3 maturity level to facilitate readiness for industrialisation and deployment. The HAVEN consortium brings together partners that have already completed validations on previous SESAR calls, so they are well-placed to progress validations to the TRL6/V3 level and bring change management activities to the end users. Moreover, the real-time simulations will be performed by ANSP-industry partners that are accustomed to working closely together to align industry product roadmaps with deployments at ANSPs.

The objective of Solution #2 is to support the ATS platform transition to a new flexible, versatile, scalable and resilient cloud-based architecture as per the SDO 6 and SDO 8 of the MP. It comprises, at TRL6/V3 maturity level, the technical feasibility demonstration of the ATS platform capacity to interoperate and interchange with third party services, along with the methodology definition of how this type of platform can be deployed in and operate from the cloud. The HAVEN consortium brings together partners that that have the range of knowledge and techniques to achieve a consensus on the principles and potential benefits of new concepts to leverage this type of transformation enabling the next generation of ATS platforms to be implemented and deployed as per the targeted new service delivery model objectives.

The expertise of all the HAVEN partners in social sciences and humanities, open science practices, and gender aspects, the kick-off meeting with the SJU will provide the opportunity to identify the need for training and awareness to improve the consortium’s effectiveness in these areas, as appropriate.

THALES CORTAIX and ENAC joined HAVEN during the Grant Agreement Preparation phase in order to leverage their respective expertise in artificial intelligence , with a goal to adopt a more ambitious approach to the integration of AI within the project.

The expertise of CORTAIX LAB and ENAC will be instrumental in pushing the boundaries of the ambition of the project and help us fulfilling its objectives. They will contribute to Solution1 (Enabling advanced operational concepts) and its related workpackages WP2 and WP5. Their main activities will be specification and development of elementary tools within an AI-based digital assistant to automate different types of ATCO tasks.

The following paragraphs provide a brief introduction to each of the consortium partners, the solutions they contribute to, how they contribute, and the type of validations they will perform, and the equipment and infrastructure they will provide.

THALES LAS is a world leader in Airspace Mobility Solutions including Air Traffic Management. Its offer includes ground, en-route and approach control centres, key airport solutions, including surveillance radars, conventional ground-based navigation systems and satellite navigation and surveillance systems. It is a key player in all major ATM modernisation and harmonization initiatives, ICAO Aviation System Block Upgrades (ASBU), SESAR and NextGen. THALES LAS will contribute with its expertise in analysing and reviewing the operational requirements to be met by the HAVEN project objectives. THALES LAS will design, prototype and develop the corresponding Technical Specifications. THALES LAS will then prepare a comprehensive validation environment, by adapting one of its core existing assets, the TopSky-ATC One and OpenSky platform, to allow the validation of the capabilities and interfaces required by the project and perform the integration of selected services. This validation platform will be used to support validation exercises involving ANSPs and industry partners.

THALES LAS also support Armed Forces in their mission to protect populations and infrastructure, against any type of air threat. Thales is a leader in Air Sovereignty, pioneering systems like SkyView or SCCOA, which has been monitoring French airspace for the last 50 years. The NATO Air Command and Control System will protect more than 10 million km2 of airspace.

THALES LAS benefits from the Thales group expertise in Artificial Intelligence. Thales is accelerating AI integration on critical systems such as ATM systems, via the THALES CORTAIX Labs initiative. including 600 AI specialists, working in both R&T and implementation; and focusing on trusted AI to provide transparency, cybersecurity energy efficiency.

Thales is a global leader in cybersecurity - no.1 in data security - generating annual revenues in excess of €2 billion in this domain and operates in 148 countries worldwide, also, Thales is involved at every level of the cyber value chain: identification, protection, detection, response and recovery. Thales's offering is focused on three families of cybersecurity products and services:

- Global security products around the broader cloud protection & licensing offerings and the following products' areas: Identity, Data security and Application security
- Sovereign protection products including encryptors and sensors to protect governmental, and institutional critical information systems.
- A complete suite of cybersecurity services around Cybels solutions portfolio, including threat and risk evaluation, training and simulation, detection and response, and integration projects.

Thales has significantly increased its strategic focus on cybersecurity in recent years, expanding its geographic footprint and portfolio of products and capabilities through organic as well as external growth, including the acquisition of Imperva in 2023.

THALES AVS is a leading subsidiary of the Thales Group, ranks among the top global suppliers of avionics equipment for civil and military aviation. The company develops advanced flight control, navigation, and cockpit systems, integrating artificial intelligence to enhance flight management. Thales AVS France SAS actively participates in key aerospace programs and alliances, including membership in CORAC (Comité pour la Recherche et l'Accord sur les Avions Civils), contributing to innovation and sustainability in aviation. THALES AVS will contribute to the HAVEN project with its expertise in air operations to provide flight trajectories optimisation algorithms for approach and en-route. THALES AVS will perform validation of the capabilities developed in the scope of the project, which shall be conducted within the validation environment provided by THALES LAS. In the frame of the HAVEN project, THALES AVS will conduct prototyping and AI model training activities within solution #1, providing artificial intelligence expertise and ingesting operational data provided by partner ANSPs within the frame of the HAVEN project.

COOPANS: COOPANS is an international partnership between the air navigation service providers of Austria (ACG), Croatia (CCL), Denmark (NAVIAIR), Ireland (AIRNAV IRELAND), Portugal (NAV PORTUGAL) and Sweden (LFV). COOPANS ANSPs have participated in several TBO-related (and automation-related) research projects and led validation exercises under SESAR 1, SESAR 2020 4D Skyways, and SESAR 3 ATC TBO (with Air Traffic Controllers, Engineers, Human Performance experts, Safety experts, Validation experts), as well as ATM virtualisation projects like EXODUS (DSD1b) and ISLAND (IR1). COOPANS contributes with experience in operational validations and development of operational concepts. In the frame of HAVEN project, COOPANS aims to perform real-time simulations using THALES LAS' SkyLab platform at its premises in Rungis and targeting TRL6/V3. These validation exercises (hosted in HAVEN project) will feed results to different WA1 ATC TBO 2 Solutions targeting either TRL4 or TRL6

DSNA (Direction des Services de la Navigation Aérienne) is the national air navigation services provider of France. It contributes to Solutions #1 and #2 by providing its expertise in ATM operations, Air Traffic Control, operational and technical validations and safety management. DSNA will perform real-time simulations using SkyLab simulation platform in THALES LAS Rungis premises and possibly live trials for a subset of validation exercises, while ensuring En-Route very high complexity airspace representativity, in order to evaluate and validate the disruptive concepts addressed by those solutions.

HungaroControl: HungaroControl (HC) is the national air navigation services provider of Hungary and also provides ATC services in the upper airspace over Kosovo. HC has implemented advanced solutions such as Free-Route Airspace and Remote Tower technology. HC with the contribution of ATM/operational experts, ATCOs, technical-, human performance- and safety experts has participated in SESAR 2020 in SESAR Wave 1 (PJ.03-A, PJ.05-02, PJ.05-03, PJ.10-01B, PJ.16-03, PJ.16-04, PJ.28), Wave 2 (PJ02, 05, 10, 13, 19, 20), Wave 3 (PJ. 34, 38) and currently participates in SESAR 3 ENSURE.

SITTI: SITTI is a world leader in the design, manufacturing and installation of integrated systems for Air Traffic Control, with special emphasis on Voice Communication Systems (VCS), recorders (VRS), gateways. The company has got extensive experience and expertise in integrated radio and telephone communications covering analogue, digital and IP-based technologies. The high level of scalability and modularity at the core of SITTI systems and their large integration capabilities allow SITTI to contribute to the HAVEN project through the supply of software-based voice handling systems that operationally and technically support the requirements set by this project. More specifically, SITTI will provide the consortium with its renowned MULTIFONO® Voice Communication System, enhanced by functional interface with TopSKY, the ATC system provided by THALES. The software applications will be capable of running both on dedicated hardware platforms (keeping physical separation between VCS and ATC sub-systems) and on virtualized hardware environments. SITTI is also chairing the EUROCAE WG126 standardization group, aimed at defining interface standards between VCS and ATC systems, some use cases thereof are part of the present project.

SSG (Sopra Steria Group): is a European leader in digital services with strong expertise in cloud infrastructures and data platforms. In this project, SSG will deploy a structured cloud infrastructure to support the consortium activities. Building on previous experience in cloud system control, SSG will ensure robustness, scalability, and security of the environment. In addition, SSG brings proven capabilities in developing trusted data platforms to guarantee reliability and integrity of shared information. SSG designed and implemented these solutions for major clients operating in highly sensitive environments, where security, sovereignty, and compliance are critical requirements.

THALES CORTAIX lab: is a cross-organization workforce that accelerates and expands AI technology integration. cortAIx labs provides robust, superior and trustworthy AI solutions tailored for critical environments.
Thales AI research center at TRT FR develops and supports the integration of cutting- edge technological differentiators in mission critical systems.

The ENAC (École Nationale de l'Aviation Civile): is France's national civil aviation university, training pilots, air traffic controllers, and aviation engineers. It also conducts research and provides expertise in aeronautics, air transport, and aviation safety. ENAC will provide support with its optimization research team on Human automation Teaming on the digital atco approach.

EASA (European Union Aviation Safety Agency) is expected to participate in the project activities. A service contract will be put in place with EASA, to ensure the participation of the Agency to the analysis and review of the project activities, and possible related recommendations.

#§CON-SOR-CS§# #§PRJ-MGT-PM§#

4. Ethics self - assessment #@QUA-LIT-QL@# #@WRK-PLA-WP@#

The project involves human-in-the-loop validation activities and may process limited personal data for organising tests and collecting outcomes. Thus, personal data collection will be minimised, processed under GDPR and results will be analysed and reported anonymously. Participants will be briefed in advance, and required ethics approvals, while free, fully informed consent (including images where applicable) will be obtained before any activity. Personal data and any security-protected data will not be disclosed and will be used only for project purposes and will be stored under the security policy defined by the project. The project introduces advanced AI to enable higher levels of automation in ATM. Thus, it foresees engagement with EASA on certification aspects of AI introduction, framing the project to be developed and validated under a safety and certification-oriented approach.

Ethical dimension of the objectives, methodology and likely impact
The project has the objectives to maintain High Ethical Standards in compliance with EU and Member States regulation. The project participants have carefully assessed the impact on Ethics and no ethical issues have been identified for project according to the conducted self-assessment. The project addresses following ethical aspects: Humans, Personal Data. Human In The Loop validation activities will be performed in several test environments as detailed in Part B of the proposal to mature the proposed solution to the target level of maturity. For the validation outcomes collection and validation activities collection, personal data might be collected and managed in accordance with GDPR Directive. There is no anticipated ethics issue nor concern neither discriminatory practices or treatment for the involvement of the operational people from the different project participants. Personal data might be collected for the organization of those activities and for the collection of results that will be anonymously analyzed and reported. The project will ensure to minimise as much as possible the collection of the personal data and their management will follow the applicable regulation and will ensure due consideration in order to not generate ethically unwanted personal or social effects. The necessary ethics approvals and free and fully informed consent of the participants will be collected before the execution of each activity. Under no circumstances, the personal data and the security protected data will be disclosed and will be used only for the purposes of the specific project organization, execution and assessment. Personal data and security protected data will be stored in accordance with the security policy that will be defined in the Grant Agreement Phase. Images and videos of project participants might be collected for communication and dissemination purposes. The possible images and videos collection and publication will be subject to involved participants approval in the consent form.

Remaining characters 2978

Compliance with ethical principles and relevant legislations
No ethical Issues have been identified. Signed consent forms will be collected before the involvement of Humans (staff of the project participants) in any testing activities informing about the the objectives of the assessments and any safety relevant aspect, including consent for being filmed. The signed consent forms will be used in compliance with GDPR regulation. The participants will be fully briefed before the execution of any activities. Under no circumstances the personal data and the security protected data will be disclosed and will be used only for the purposes of the specific project organization, execution and assessment. Refer to Ethics annex for further elaboration.

Associated with document Ref. Ares(2026)4423868 - 29/04/2026

ANNEX 2

ESTIMATED BUDGET (LUMP SUM BREAKDOWN) FOR THE ACTION

	Estimated EU contribution						
	Estimated eligible lump sum contributions (per work package)						Maximum grant amount[1]
	WP1 Project Management & Coordination - first period	WP2 Support to advanced operational concepts - first period	WP3 Next generation ATS platform architecture & deployment - first period	WP4 Project Management & Coordination - second period	WP5 Support to advanced operational concepts - second period	WP6 Next generation ATS platform architecture & deployment - second period	
Forms of funding	Lump sum contribution	Lump sum contribution	Lump sum contribution	Lump sum contribution	Lump sum contribution	Lump sum contribution	
	a	b	c	d	e	f	g = a + b + c + d + e + f
1 - THALES LAS	538 690.87	3 033 710.43	5 518 617.87	651 938.16	2 792 686.45	5 421 672.82	17 957 316.60
2 - THALES AVS	299 815.26	800 203.08	299 692.35	0.00	0.00	948 615.50	2 348 326.19
3 - DSNA	19 757.50	188 562.50	237 956.25	19 757.50	419 685.00	353 981.25	1 239 700.00
4 - LFV	0.00	207 447.36	0.00	0.00	329 186.02	0.00	536 633.38
5 - NAVIAIR	0.00	58 333.17	0.00	0.00	58 333.17	0.00	116 666.34
6 - ACG	0.00	58 146.38	0.00	0.00	58 146.38	0.00	116 292.76
7 - AIRNAV IRELAND	0.00	58 333.17	0.00	0.00	58 333.17	0.00	116 666.34
8 - CCL	0.00	58 332.05	0.00	0.00	58 332.05	0.00	116 664.10
9 - NAV PORTUGAL	0.00	55 998.69	0.00	0.00	60 665.24	0.00	116 663.93
10 - HC	15 648.94	25 575.59	4 717.13	15 648.94	25 575.59	4 717.13	91 883.32
11 - SSG	0.00	288 225.00	17 500.00	294 175.00	0.00	1 688 124.42	2 288 024.42
12 - SITTI	71 233.75	354 130.00	637 166.25	71 233.75	179 130.00	637 166.25	1 950 060.00
13 - ENAC	0.00	55 000.00	0.00	0.00	50 000.00	0.00	105 000.00
14 - THALES CORTAIX	0.00	200 000.00	0.00	0.00	200 000.00	0.00	400 000.00
Σ consortium	945 146.32	5 441 997.42	6 715 649.85	1 052 753.35	4 290 073.07	9 054 277.37	27 499 897.38

[1] The 'maximum grant amount' is the maximum grant amount fixed in the grant agreement (on the basis of the sum of the beneficiaries' lump sum shares for the work packages).

ANNEX 3

ACCESSION FORM FOR BENEFICIARIES

THALES AVS FRANCE SAS (THALES AVS), PIC 999984447, established in 75-77 AVENUE MARCEL DASSAULT, MERIGNAC 33700, France,

hereby agrees

to become beneficiary

in Agreement No 101286541 — HAVEN ('the Agreement')

between THALES LAS FRANCE SAS (THALES LAS) **andSESAR3 Joint Undertaking** ('granting authority'), under the powers delegated by the European Commission ('European Commission'),

and mandates

the coordinator to submit and sign in its name and on its behalf any **amendments** to the Agreement, in accordance with Article 39.

By signing this accession form, the beneficiary accepts the grant and agrees to implement it in accordance with the Agreement, with all the obligations and terms and conditions it sets out.

SIGNATURE

For the beneficiary

Nicolas POMMIES with ECAS id n00dodoi signed in the Participant Portal on 18/05/2026 at 15:59:14 (transaction id SigId-4051-hzur3t AvqiWIULEB5SfqivdImcQzoSo5tMoPX9Rv3nyfEGMqZKryzHUxy951J vs8LYUzzOdJDtN2MOc6YVE4Lze0-POMaLlcnzRygWFnJ0ibqHK-wkU BzOHGRjfA9pIPaoB2JBXvfnfjeMOlZvknHnjGJ6PHhxMFacssX9Hmyu Pza7zrzJuuefDDRqrNoONuISF5r8O). Timestamp by third party at 2026.05.18 15:59:23 CEST

ANNEX 3

ACCESSION FORM FOR BENEFICIARIES

DIRECTION DES SERVICES DE LA NAVIGATION AERIENNE (DSNA), PIC 928673636, established in 50 RUE HENRY FARMAN, PARIS 75720, France,

hereby agrees

to become beneficiary

in Agreement No 101286541 — HAVEN ('the Agreement')

between THALES LAS FRANCE SAS (THALES LAS) **andSESAR3 Joint Undertaking** ('granting authority'), under the powers delegated by the European Commission ('European Commission'),

and mandates

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SIGNATURE

For the beneficiary

ANNEX 3

ACCESSION FORM FOR BENEFICIARIES

LUFTFARTSVERKET (LFV), PIC 942346077, established in HOSPITALSGATAN 30, NORRKOPING 602 27, Sweden,

hereby agrees

to become beneficiary

in Agreement No 101286541 — HAVEN ('the Agreement')

between THALES LAS FRANCE SAS (THALES LAS) **andSESAR3 Joint Undertaking** ('granting authority'), under the powers delegated by the European Commission ('European Commission'),

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SIGNATURE

For the beneficiary

ANNEX 3

ACCESSION FORM FOR BENEFICIARIES

NAVIAIR (NAVIAIR), PIC 923671249, established in NAVIAIR ALLE 1, KASTRUP 2770, Denmark,

hereby agrees

to become beneficiary

in Agreement No 101286541 — HAVEN ('the Agreement')

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and mandates

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SIGNATURE

For the beneficiary

Mads Kvist Eriksen with ECAS id n00cbjyo signed in the Participant Portal on 19/05/2026 at 13:23:41 (transaction id SigId-8043-q1ZPgtsjaszkYsKLYCMi2sPFD4BEF5PuyPmQd7LyOJKzsfqRdoPzzuc4W5QCsCP5qvecuihnIG5EFQpmoWm30OS-POMaLlcnzRygWFnJ0ibqHK-HFiGwYvkP6zfm6fQ8ebCqorIsYg1FwiRlXMGzVbV3k0Lk6zePec76la0yEAiQguYuCqLO9gHAGqV4zqzlUOrkjF). Timestamp by third party at 2026.05.19 13:23:46 CEST

ANNEX 3

ACCESSION FORM FOR BENEFICIARIES

AUSTRO CONTROL OSTERREICHISCHE GESELLSCHAFT FUR ZIVILLUFTFAHRT MBH (ACG), PIC 998956635, established in SCHNIRCHGASSE 17, WIEN 1030, Austria,

hereby agrees

to become beneficiary

in Agreement No 101286541 — HAVEN ('the Agreement')

between THALES LAS FRANCE SAS (THALES LAS) **andSESAR3 Joint Undertaking** ('granting authority'), under the powers delegated by the European Commission ('European Commission'),

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SIGNATURE

For the beneficiary

Erich KLOCK with ECAS id nkloceri signed in the Participant Portal on 19/05/2026 at 07:56:21 (transaction id SigId-5399-WB1w2Z4vorHc5VkblrdxQDjKEJwAlx7YuzTmzZxyjlW2UZYkMYwiUMeJaPkg1O8SQCduMONQJ7BdU7iYLqMXM8-POMaLlcnzRygWFnJ0ibqHK-SdZzlLd34YcbRzldgzN5pH3ad73vfsVvmvL5TyYB8j0rY30UW5zbkeE82gJ7LL6UJ3jzgDcTYqs7F69wphtTXCb). Timestamp by third party at 2026.05.19 07:56:30 CEST

ANNEX 3

ACCESSION FORM FOR BENEFICIARIES

THE IRISH AIR NAVIGATION SERVICE (AIRNAV IRELAND), PIC 881850281, established in THE TIMES BUILDING D'OLIER STREET, DUBLIN D02 T449, Ireland,

hereby agrees

to become beneficiary

in Agreement No 101286541 — HAVEN ('the Agreement')

between THALES LAS FRANCE SAS (THALES LAS) **andSESAR3 Joint Undertaking** ('granting authority'), under the powers delegated by the European Commission ('European Commission'),

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SIGNATURE

For the beneficiary

kieran fox with ECAS id n00lx1pn signed in the Participant Portal on 27/05/2026 at 10:58:23 (transaction id SigId-9165-St5M9Bts4gxm3ujzsh0FCqMzU52DzLq889sPyDRB8ZLzdM34a5GfBH1ebP7KWnrsMy039K4kogQwp8YlIK9AuQ4-R2zIpfT8xjM178RdBPYo0m-0ZeYYVMyoa9YlxsZzXbzwagirPyeuXDPcziSv8dUWP31NJOVTCNduf0ZO3Jv58pub4ZsRQJNhfVSp1Bk1r4NGYW). Timestamp by third party at 2026.05.27 10:58:31 CEST

ANNEX 3

ACCESSION FORM FOR BENEFICIARIES

HRVATSKA KONTROLA ZRACNE PLOVIDBE DOO (CCL), PIC 924128216, established in RUDOLFA FIZIRA 2, VELIKA GORICA 10410, Croatia,

hereby agrees

to become beneficiary

in Agreement No 101286541 — HAVEN ('the Agreement')

between THALES LAS FRANCE SAS (THALES LAS) **andSESAR3 Joint Undertaking** ('granting authority'), under the powers delegated by the European Commission ('European Commission'),

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SIGNATURE

For the beneficiary

Mario Kunovec-Varga with ECAS id n0077eok signed in the Participant Portal on 19/05/2026 at 01:23:17 (transaction id SigId-5282-QqX5l08dG4aps7M1sdw63EyOCl1JCfMBS0IkCCqyS0arIc6MP0KEIn6PwjQ41h3vzxrEZBOcLs9AGMVYzRwy0v-POMaLlcnzRygWFnJ0ibqHK-sIDSKm5vtzqOCDHNIJOIht4XHdLPEfZZrzxQ655nAO4zrzOI14LlmhIWKIrOAzlUZ2qnWaTZurQftsFtzeal5MpW). Timestamp by third party at 2026.05.19 01:23:30 CEST

ANNEX 3

ACCESSION FORM FOR BENEFICIARIES

NAVEGACAO AEREA DE PORTUGAL - NAV PORTUGAL EPE (NAV PORTUGAL), PIC 955596471, established in RUA D EDIFICIO 121 AEROPORTO DE, LISBOA 1700 008, Portugal,

hereby agrees

to become beneficiary

in Agreement No 101286541 — HAVEN ('the Agreement')

between THALES LAS FRANCE SAS (THALES LAS) **andSESAR3 Joint Undertaking** ('granting authority'), under the powers delegated by the European Commission ('European Commission'),

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SIGNATURE

For the beneficiary

ANNEX 3

ACCESSION FORM FOR BENEFICIARIES

HUNGAROCONTROL MAGYAR LEGIFORGALMISZOLGALAT ZARTKORUEN MUKODO RESZVENYTARSASAG (HC), PIC 941767472, established in IGLO UTCA 33 35, BUDAPEST 1185, Hungary,

hereby agrees

to become beneficiary

in Agreement No 101286541 — HAVEN ('the Agreement')

between THALES LAS FRANCE SAS (THALES LAS) **andSESAR3 Joint Undertaking** ('granting authority'), under the powers delegated by the European Commission ('European Commission'),

and mandates

the coordinator to submit and sign in its name and on its behalf any **amendments** to the Agreement, in accordance with Article 39.

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SIGNATURE

For the beneficiary

Zoltan Vekey with ECAS id n006vlnx signed in the Participant Portal on 13/05/2026 at 15:40:27 (transaction id SigId-16263-kqp6reLj6bc OdpKK4kSZKIP3zPJqy06TnfVFZmYzSqBDa6Zk38ZKK7qnvIQesnE12 eGnoXAzxGkI7izgIHgw618-R2zIpfT8xjMVQv7ei6TcSG-UhWkQeRjbg Yy8dsWcvIzKHSPzjbwnVmzRU2YmS2y1wxphoeUzqzyXt6VHXEAoy7 4lVAd0kp71x2YEGc722MUStM). Timestamp by third party at 2026.05.13 15:40:34 CEST

ANNEX 3

ACCESSION FORM FOR BENEFICIARIES

SOPRA STERIA GROUP (SSG), PIC 951375807, established in ZAE LES GLAISINS 3 RUE DU PRE FAUCON, ANNECY LE VIEUX 74940, France,

hereby agrees

to become beneficiary

in Agreement No 101286541 — HAVEN ('the Agreement')

between THALES LAS FRANCE SAS (THALES LAS) **andSESAR3 Joint Undertaking** ('granting authority'), under the powers delegated by the European Commission ('European Commission'),

and mandates

the coordinator to submit and sign in its name and on its behalf any **amendments** to the Agreement, in accordance with Article 39.

By signing this accession form, the beneficiary accepts the grant and agrees to implement it in accordance with the Agreement, with all the obligations and terms and conditions it sets out.

SIGNATURE

For the beneficiary

ANNEX 3

ACCESSION FORM FOR BENEFICIARIES

S.I.T.T.I. SPECIALE IMPIANTI TELESCRIVENTI TELEFONICI INTERNI SPA (SITTI), PIC 890100228, established in VIA CARDUCCI 8, MILANO 20123, Italy,

hereby agrees

to become beneficiary

in Agreement No 101286541 — HAVEN ('the Agreement')

between THALES LAS FRANCE SAS (THALES LAS) **andSESAR3 Joint Undertaking** ('granting authority'), under the powers delegated by the European Commission ('European Commission'),

and mandates

the coordinator to submit and sign in its name and on its behalf any **amendments** to the Agreement, in accordance with Article 39.

By signing this accession form, the beneficiary accepts the grant and agrees to implement it in accordance with the Agreement, with all the obligations and terms and conditions it sets out.

SIGNATURE

For the beneficiary

ROBERTO WEGER with ECAS id n007coii signed in the Participant Portal on 14/05/2026 at 16:43:49 (transaction id SigId-19447-peumoouN8Cue9dx43zqgOzS0vDEYrg1YVRc8Rb6avj5jpScBrzi6iuSQbuxY732jL3zdRF3fHtHHzoMfYGlLl0N-R2zIpfT8xjMVQv7ei6TcSG-KGsr0MCOzeYJsyAzkZ1u8G86kK1CAZsk8wGuqLzjzLR7JwYCHx7M3rbclCtbLUkuj3zWTzaEfzPqCOT9qzgstX1K). Timestamp by third party at 2026.05.14 16:43:55 CEST

ANNEX 3

ACCESSION FORM FOR BENEFICIARIES

ECOLE NATIONALE DE L AVIATION CIVILE (ENAC), PIC 996375756, established in AVENUE EDOUARD BELIN 7, TOULOUSE 31400, France,

hereby agrees

to become beneficiary

in Agreement No 101286541 — HAVEN ('the Agreement')

between THALES LAS FRANCE SAS (THALES LAS) **andSESAR3 Joint Undertaking** ('granting authority'), under the powers delegated by the European Commission ('European Commission'),

and mandates

the coordinator to submit and sign in its name and on its behalf any **amendments** to the Agreement, in accordance with Article 39.

By signing this accession form, the beneficiary accepts the grant and agrees to implement it in accordance with the Agreement, with all the obligations and terms and conditions it sets out.

SIGNATURE

For the beneficiary

Mathy GONON with ECAS id ngononma signed in the Participant Portal on 18/05/2026 at 15:48:32 (transaction id SigId-3970-ZeHB0Sb4UZFuP1U3DWCpgn8J8Ccw4zfzIKzfjAaifbfGGdebvxJM479QJpZj6cyK7kO2UkwqqftTDg9sNNROnnW-POMaLlcnzRygWFnJ0ibqHK-sUZhpUYPAAf89egjDNEj4G35gOxMufPa6fW0zPVZF36TrR70uxc3iYDqMiUUJuVnJSOc1fFo6zyzzWvxQQe7UGi). Timestamp by third party at 2026.05.18 15:48:40 CEST

ANNEX 3

ACCESSION FORM FOR BENEFICIARIES

THALES (THALES CORTAIX), PIC 999751938, established in 4 RUE DE LA VERRERIE, MEUDON 92190, France,

hereby agrees

to become beneficiary

in Agreement No 101286541 — HAVEN ('the Agreement')

between THALES LAS FRANCE SAS (THALES LAS) **andSESAR3 Joint Undertaking** ('granting authority'), under the powers delegated by the European Commission ('European Commission'),

and mandates

the coordinator to submit and sign in its name and on its behalf any **amendments** to the Agreement, in accordance with Article 39.

By signing this accession form, the beneficiary accepts the grant and agrees to implement it in accordance with the Agreement, with all the obligations and terms and conditions it sets out.

SIGNATURE

For the beneficiary

Cédric DEMEURE with ECAS id ndemeuce signed in the Participant Portal on 13/05/2026 at 15:56:00 (transaction id SigId-16423-dtpJnjtuvMtvhxNAMLJwFI01Efk1Os5xc9fIUOpkJmQOCb4jC8zzzJDMV9Da3W65BbFYCITeRtQrr4RKYzVwUl0-R2zIpfT8xjMVQv7ei6TcSG-PDrQnN1MG1zjcAyGaNelHfzrWtxY7UGAx5IkzV37zRmQEGChzzdycY8zn6apeVDK6leMQ39boPmiJszfF66HQOKO). Timestamp by third party at 2026.05.13 15:56:09 CEST

ANNEX 4 XXX LUMP SUM MGA — MULTI & MONO

FINANCIAL STATEMENT FOR THE ACTION FOR REPORTING PERIOD [NUMBER]

	EU contribution											
	Eligible lump sum contributions (per work package)											Requested EU contribution
	WP1 [name]	WP2 [name]	WP3 [name]	WP4 [name]	WP5 [name]	WP6 [name]	WP7 [name]	WP8 [name]	WP9 [name]	WP10 [name]	WP [XX]	
Forms of funding	[Lump sum contribution]/[Financing not linked to costs]	[Lump sum contribution]/[Financing not linked to costs]	[Lump sum contribution]/[Financing not linked to costs]	[Lump sum contribution]/[Financing not linked to costs]	[Lump sum contribution]/[Financing not linked to costs]	[Lump sum contribution]/[Financing not linked to costs]	[Lump sum contribution]/[Financing not linked to costs]	[Lump sum contribution]/[Financing not linked to costs]	[Lump sum contribution]/[Financing not linked to costs]	[Lump sum contribution]/[Financing not linked to costs]	[Lump sum contribution]/[Financing not linked to costs]	
Status of completion	**COMPLETED**	**COMPLETED**	**COMPLETED**	**COMPLETED**	**COMPLETED**	**COMPLETED**	**COMPLETED**	**PARTIALLY COMPLETED**	**PARTIALLY COMPLETED**	**COMPLETED**	**NOT COMPLETED**	
	a	b	c	d	e	f	g	h	i	j	k	l = a + b+ c + d+ e+ f+ g+ h+ i+ j+ k
1 – [short name beneficiary]												
1.1 – [short name affiliated entity]												
2 – [short name beneficiary]												
2.1 – [short name affiliated entity]												
X – [short name associated partner]												
Total consortium												

The consortium hereby confirms that:

The information provided is complete, reliable and true.

The lump sum contributions declared are eligible (in particular, the work packages have been completed and the work has been properly implemented and/or the results were achieved; see Article 6).

The proper implementation of the action/achievement of the results can be substantiated by adequate records and supporting documentation that will be produced upon request or in the context of checks, reviews, audits and investigations (see Articles 19, 21 and 25).

ANNEX 5

SPECIFIC RULES

CONFIDENTIALITY AND SECURITY (— ARTICLE 13)

Sensitive information with security recommendation

Sensitive information with a security recommendation must comply with the additional requirements imposed by the granting authority.

Before starting the action tasks concerned, the beneficiaries must have obtained all approvals or other mandatory documents needed for implementing the task. The documents must be kept on file and be submitted upon request by the coordinator to the granting authority. If they are not in English, they must be submitted together with an English summary.

For requirements restricting disclosure or dissemination, the information must be handled in accordance with the recommendation and may be disclosed or disseminated only after written approval from the granting authority.

EU classified information

If EU classified information is used or generated by the action, it must be treated in accordance with the security classification guide (SCG) and security aspect letter (SAL) set out in Annex 1 and Decision 2015/444[1] and its implementing rules — until it is declassified.

Deliverables which contain EU classified information must be submitted according to special procedures agreed with the granting authority.

Action tasks involving EU classified information may be subcontracted only with prior explicit written approval from the granting authority and only to entities established in an EU Member State or in a non-EU country with a security of information agreement with the EU (or an administrative arrangement with the Commission).

EU classified information may not be disclosed to any third party (including participants involved in the action implementation) without prior explicit written approval from the granting authority.

ETHICS (— ARTICLE 14)

Ethics and research integrity

The beneficiaries must carry out the action in compliance with:

- ethical principles (including the highest standards of research integrity)

[1] Commission Decision 2015/444/EC, Euratom of 13 March 2015 on the security rules for protecting EU classified information (OJ L 72, 17.3.2015, p. 53).

and

- applicable EU, international and national law, including the EU Charter of Fundamental Rights and the European Convention for the Protection of Human Rights and Fundamental Freedoms and its Supplementary Protocols.

No funding can be granted, within or outside the EU, for activities that are prohibited in all Member States. No funding can be granted in a Member State for an activity which is forbidden in that Member State.

The beneficiaries must pay particular attention to the principle of proportionality, the right to privacy, the right to the protection of personal data, the right to the physical and mental integrity of persons, the right to non-discrimination, the need to ensure protection of the environment and high levels of human health protection.

The beneficiaries must ensure that the activities under the action have an exclusive focus on civil applications.

The beneficiaries must ensure that the activities under the action do not:

- aim at human cloning for reproductive purposes
- intend to modify the genetic heritage of human beings which could make such modifications heritable (with the exception of research relating to cancer treatment of the gonads, which may be financed)
- 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, or
- lead to the destruction of human embryos (for example, for obtaining stem cells).

Activities involving research on human embryos or human embryonic stem cells may be carried out only if:

- they are set out in Annex 1 or
- the coordinator has obtained explicit approval (in writing) from the granting authority.

In addition, the beneficiaries must respect the fundamental principle of research integrity — as set out in the European Code of Conduct for Research Integrity[2].

This implies compliance with the following principles:

- reliability in ensuring the quality of research reflected in the design, the methodology, the analysis and the use of resources
- honesty in developing, undertaking, reviewing, reporting and communicating research in a transparent, fair and unbiased way
- respect for colleagues, research participants, society, ecosystems, cultural heritage and the environment

[2] European Code of Conduct for Research Integrity of ALLEA (All European Academies).

- accountability for the research from idea to publication, for its management and organisation, for training, supervision and mentoring, and for its wider impacts

and means that beneficiaries must ensure that persons carrying out research tasks follow the good research practices including ensuring, where possible, openness, reproducibility and traceability and refrain from the research integrity violations described in the Code.

Activities raising ethical issues must comply with the additional requirements formulated by the ethics panels (including after checks, reviews or audits; see Article 25).

Before starting an action task raising ethical issues, the beneficiaries must have obtained all approvals or other mandatory documents needed for implementing the task, notably from any (national or local) ethics committee or other bodies such as data protection authorities.

The documents must be kept on file and be submitted upon request by the coordinator to the granting authority. If they are not in English, they must be submitted together with an English summary, which shows that the documents cover the action tasks in question and includes the conclusions of the committee or authority concerned (if any).

VALUES (— ARTICLE 14)

Gender mainstreaming

The beneficiaries must take all measures to promote equal opportunities between men and women in the implementation of the action and, where applicable, in line with the gender equality plan. They must aim, to the extent possible, for a gender balance at all levels of personnel assigned to the action, including at supervisory and managerial level.

INTELLECTUAL PROPERTY RIGHTS (IPR) — BACKGROUND AND RESULTS — ACCESS RIGHTS AND RIGHTS OF USE (— ARTICLE 16)

Definitions

Access rights — Rights to use results or background.

Dissemination — The public disclosure of the results by appropriate means, other than resulting from protecting or exploiting the results, including by scientific publications in any medium.

Exploit(ation) — The use of results in further research and innovation activities other than those covered by the action concerned, including among other things, commercial exploitation such as developing, creating, manufacturing and marketing a product or process, creating and providing a service, or in standardisation activities.

Fair and reasonable conditions — Appropriate conditions, including possible financial terms or royalty-free conditions, taking into account the specific circumstances of the request for access, for example the actual or potential value of the results or background to which access is requested and/or the scope, duration or other characteristics of the exploitation envisaged.

FAIR principles — ‘findability’, ‘accessibility’, ‘interoperability’ and ‘reusability’.

Open access — Online access to research outputs provided free of charge to the end-user.

Open science — An approach to the scientific process based on open cooperative work, tools and diffusing knowledge.

Research data management — The process within the research lifecycle that includes the organisation, storage, preservation, security, quality assurance, allocation of persistent identifiers (PIDs) and rules and procedures for sharing of data including licensing.

Research outputs — Results to which access can be given in the form of scientific publications, data or other engineered results and processes such as software, algorithms, protocols, models, workflows and electronic notebooks.

Scope of the obligations

For this section, references to ‘beneficiary’ or ‘beneficiaries’ do not include affiliated entities (if any).

Agreement on background — Background free from restrictions

The beneficiaries must identify in a written agreement the background as needed for implementing the action or for exploiting its results.

Where the call conditions restrict control due to strategic interests reasons, background that is subject to control or other restrictions by a country (or entity from a country) which is not one of the eligible countries or target countries set out in the call conditions and that impact the exploitation of the results (i.e. would make the exploitation of the results subject to control or restrictions) must not be used and must be explicitly excluded in the agreement on background — unless otherwise agreed with the granting authority.

Results free from restrictions

Where the call conditions restrict control due to strategic interests reasons, the beneficiaries must ensure that the results of the action are not subject to control or other restrictions by a country (or entity from a country) which is not one of the eligible countries or target countries set out in the call conditions — unless otherwise agreed with the granting authority.

Ownership of results

Results are owned by the beneficiaries that generate them.

However, two or more beneficiaries own results jointly if:

- they have jointly generated them and
- it is not possible to:
    - establish the respective contribution of each beneficiary, or
    - separate them for the purpose of applying for, obtaining or maintaining their protection.

The joint owners must agree — in writing — on the allocation and terms of exercise of their joint ownership (‘joint ownership agreement’), to ensure compliance with their obligations under this Agreement.

Unless otherwise agreed in the joint ownership agreement or consortium agreement, each joint owner may grant non-exclusive licences to third parties to exploit the jointly-owned results (without any right to sub-license), if the other joint owners are given:

- at least 45 days advance notice and
- fair and reasonable compensation.

The joint owners may agree — in writing — to apply another regime than joint ownership.

If third parties (including employees and other personnel) may claim rights to the results, the beneficiary concerned must ensure that those rights can be exercised in a manner compatible with its obligations under the Agreement.

The beneficiaries must indicate the owner(s) of the results (results ownership list) in the final periodic report.

Protection of results

Beneficiaries which have received funding under the grant must adequately protect their results — for an appropriate period and with appropriate territorial coverage — if protection is possible and justified, taking into account all relevant considerations, including the prospects for commercial exploitation, the legitimate interests of the other beneficiaries and any other legitimate interests.

Exploitation of results

Beneficiaries which have received funding under the grant must — up to four years after the end of the action (see Data Sheet, Point 1) — use their best efforts to exploit their results directly or to have them exploited indirectly by another entity, in particular through transfer or licensing.

If, despite a beneficiary's best efforts, the results are not exploited within one year after the end of the action, the beneficiaries must (unless otherwise agreed in writing with the granting authority) use the Horizon Results Platform to find interested parties to exploit the results.

If results are incorporated in a standard, the beneficiaries must (unless otherwise agreed with the granting authority or unless it is impossible) ask the standardisation body to include the funding statement (see Article 17) in (information related to) the standard.

Additional exploitation obligations

Where the call conditions impose additional exploitation obligations (including obligations linked to the restriction of participation or control due to strategic assets, interests, autonomy or security reasons), the beneficiaries must comply with them — up to four years after the end of the action (see Data Sheet, Point 1).

Where the call conditions impose additional exploitation obligations in case of a public emergency, the beneficiaries must (if requested by the granting authority) grant for a limited period of time specified in the request, non-exclusive licences — under fair and reasonable conditions — to their results to legal entities that need the results to address the public emergency and commit to rapidly and broadly exploit the resulting products and services at fair and reasonable conditions. This provision applies up to four years after the end of the action (see Data Sheet, Point 1).

Additional information obligation relating to standards

Where the call conditions impose additional information obligations relating to possible standardisation, the beneficiaries must — up to four years after the end of the action (see Data Sheet, Point 1) — inform the granting authority, if the results could reasonably be expected to contribute to European or international standards.

Transfer and licensing of results

Transfer of ownership

The beneficiaries may transfer ownership of their results, provided this does not affect compliance with their obligations under the Agreement.

The beneficiaries must ensure that their obligations under the Agreement regarding their results are passed on to the new owner and that this new owner has the obligation to pass them on in any subsequent transfer.

Moreover, they must inform the other beneficiaries with access rights of the transfer at least 45 days in advance (or less if agreed in writing), unless agreed otherwise in writing for specifically identified third parties including affiliated entities or unless impossible under the applicable law. This notification must include sufficient information on the new owner to enable the beneficiaries concerned to assess the effects on their access rights. The beneficiaries may object within 30 days of receiving notification (or less if agreed in writing), if they can show that the transfer would adversely affect their access rights. In this case, the transfer may not take place until agreement has been reached between the beneficiaries concerned.

Granting licences

The beneficiaries may grant licences to their results (or otherwise give the right to exploit them), including on an exclusive basis, provided this does not affect compliance with their obligations.

Exclusive licences for results may be granted only if all the other beneficiaries concerned have waived their access rights.

Granting authority right to object to transfers or licensing — Horizon Europe actions

Where the call conditions in Horizon Europe actions provide for the right to object to transfers or licensing, the granting authority may — up to four years after the end of the action (see Data Sheet, Point 1) — object to a transfer of ownership or the exclusive licensing of results, if:

- the beneficiaries which generated the results have received funding under the grant
- it is to a legal entity established in a non-EU country not associated with Horizon Europe, and
- the granting authority considers that the transfer or licence is not in line with EU interests.

Beneficiaries that intend to transfer ownership or grant an exclusive licence must formally notify the granting authority before the intended transfer or licensing takes place and:

- identify the specific results concerned
- describe in detail the new owner or licensee and the planned or potential exploitation of the results, and
- include a reasoned assessment of the likely impact of the transfer or licence on EU interests, in particular regarding competitiveness as well as consistency with ethical principles and security considerations.

The granting authority may request additional information.

If the granting authority decides to object to a transfer or exclusive licence, it must formally notify the beneficiary concerned within 60 days of receiving notification (or any additional information it has requested).

No transfer or licensing may take place in the following cases:

- pending the granting authority decision, within the period set out above
- if the granting authority objects
- until the conditions are complied with, if the granting authority objection comes with conditions.

A beneficiary may formally notify a request to waive the right to object regarding intended transfers or grants to a specifically identified third party, if measures safeguarding EU interests are in place. If the granting authority agrees, it will formally notify the beneficiary concerned within 60 days of receiving notification (or any additional information requested).

Limitations to transfers and licensing due to strategic assets, interests, autonomy or security reasons of the EU and its Member States

Where the call conditions restrict participation or control due to strategic assets, interests, autonomy or security reasons, the beneficiaries may not transfer ownership of their results or grant licences to third parties which are established in countries which are not eligible countries or target countries set out in the call conditions (or, if applicable, are controlled by such countries or entities from such countries) — unless they have requested and received prior approval by the granting authority.

The request must:

- identify the specific results concerned
- describe in detail the new owner or licensee and the planned or potential exploitation of the results, and
- include a reasoned assessment of the likely impact of the transfer or license on the strategic assets, interests, autonomy or security of the EU and its Member States.

The granting authority may request additional information.

Access rights to results and background

Exercise of access rights — Waiving of access rights — No sub-licensing

Requests to exercise access rights and the waiver of access rights must be in writing.

Unless agreed otherwise in writing with the beneficiary granting access, access rights do not include the right to sub-license.

If a beneficiary is no longer involved in the action, this does not affect its obligations to grant access.

If a beneficiary defaults on its obligations, the beneficiaries may agree that that beneficiary no longer has access rights.

Access rights for implementing the action

The beneficiaries must grant each other access — on a royalty-free basis — to background needed to implement their own tasks under the action, unless the beneficiary that holds the background has — before acceding to the Agreement —:

- informed the other beneficiaries that access to its background is subject to restrictions, or

- agreed with the other beneficiaries that access would not be on a royalty-free basis.

The beneficiaries must grant each other access — on a royalty-free basis — to results needed for implementing their own tasks under the action.

Access rights for exploiting the results

The beneficiaries must grant each other access — under fair and reasonable conditions — to results needed for exploiting their results.

The beneficiaries must grant each other access — under fair and reasonable conditions — to background needed for exploiting their results, unless the beneficiary that holds the background has — before acceding to the Agreement — informed the other beneficiaries that access to its background is subject to restrictions.

Requests for access must be made — unless agreed otherwise in writing — up to one year after the end of the action (see Data Sheet, Point 1).

Access rights for entities under the same control

Unless agreed otherwise in writing by the beneficiaries, access to results and, subject to the restrictions referred to above (if any), background must also be granted — under fair and reasonable conditions — to entities that:

- are established in an EU Member State or Horizon Europe associated country

- are under the direct or indirect control of another beneficiary, or under the same direct or indirect control as that beneficiary, or directly or indirectly controlling that beneficiary and

- need the access to exploit the results of that beneficiary.

Unless agreed otherwise in writing, such requests for access must be made by the entity directly to the beneficiary concerned.

Requests for access must be made — unless agreed otherwise in writing — up to one year after the end of the action (see Data Sheet, Point 1).

Access rights for the granting authority, EU institutions, bodies, offices or agencies and national authorities to results for policy purposes — Horizon Europe actions

In Horizon Europe actions, the beneficiaries which have received funding under the grant must grant access to their results — on a royalty-free basis — to the granting authority, EU institutions, bodies, offices or agencies for developing, implementing and monitoring EU policies or programmes. Such access rights do not extend to beneficiaries' background.

Such access rights are limited to non-commercial and non-competitive use.

For actions under the cluster 'Civil Security for Society', such access rights also extend to national authorities of EU Member States for developing, implementing and monitoring their policies or programmes in this area. In this case, access is subject to a bilateral agreement to define specific conditions ensuring that:

- the access rights will be used only for the intended purpose and
- appropriate confidentiality obligations are in place.

Moreover, the requesting national authority or EU institution, body, office or agency (including the granting authority) must inform all other national authorities of such a request.

Additional access rights

Where the call conditions impose additional access rights, the beneficiaries must comply with them.

COMMUNICATION, DISSEMINATION, OPEN SCIENCE AND VISIBILITY (— ARTICLE 17)

Dissemination

Dissemination of results

The beneficiaries must disseminate their results as soon as feasible, in a publicly available format, subject to any restrictions due to the protection of intellectual property, security rules or legitimate interests.

A beneficiary that intends to disseminate its results must give at least 15 days advance notice to the other beneficiaries (unless agreed otherwise), together with sufficient information on the results it will disseminate.

Any other beneficiary may object within (unless agreed otherwise) 15 days of receiving notification, if it can show that its legitimate interests in relation to the results or background would be significantly harmed. In such cases, the results may not be disseminated unless appropriate steps are taken to safeguard those interests.

Additional dissemination obligations

Where the call conditions impose additional dissemination obligations, the beneficiaries must also comply with those.

Open Science

Open science: open access to scientific publications

The beneficiaries must ensure open access to peer-reviewed scientific publications relating to their results. In particular, they must ensure that:

- at the latest at the time of publication, a machine-readable electronic copy of the published version or the final peer-reviewed manuscript accepted for publication, is deposited in a trusted repository for scientific publications

- immediate open access is provided to the deposited publication via the repository, under the latest available version of the Creative Commons Attribution International Public Licence (CC BY) or a licence with equivalent rights; for monographs and other long-text formats, the licence may exclude commercial uses and derivative works (e.g. CC BY-NC, CC BY-ND) and

- information is given via the repository about any research output or any other tools and instruments needed to validate the conclusions of the scientific publication.

Beneficiaries (or authors) must retain sufficient intellectual property rights to comply with the open access requirements.

Metadata of deposited publications must be open under a Creative Common Public Domain Dedication (CC 0) or equivalent, in line with the FAIR principles (in particular machine-actionable) and provide information at least about the following: publication (author(s), title, date of publication, publication venue); Horizon Europe or Euratom funding; grant project name, acronym and number; licensing terms; persistent identifiers for the publication, the authors involved in the action and, if possible, for their organisations and the grant. Where applicable, the metadata must include persistent identifiers for any research output or any other tools and instruments needed to validate the conclusions of the publication.

Only publication fees in full open access venues for scientific publications are eligible for reimbursement.

Open science: research data management

The beneficiaries must manage the digital research data generated in the action ('data') responsibly, in line with the FAIR principles and by taking all of the following actions:

- establish a data management plan ('DMP') (and regularly update it)

- as soon as possible and within the deadlines set out in the DMP, deposit the data in a trusted repository; if required in the call conditions, this repository must be federated in the EOSC in compliance with EOSC requirements

- as soon as possible and within the deadlines set out in the DMP, ensure open access — via the repository — to the deposited data, under the latest available version of the Creative Commons Attribution International Public License (CC BY) or Creative Commons Public Domain Dedication (CC 0) or a licence/dedication with equivalent rights, following the principle 'as open as possible as closed as necessary', unless providing open access would in particular:

    - be against the beneficiary's legitimate interests, including regarding commercial exploitation, or

- be contrary to any other constraints, in particular the EU competitive interests or the beneficiary's obligations under this Agreement; if open access is not provided (to some or all data), this must be justified in the DMP

- provide information via the repository about any research output or any other tools and instruments needed to re-use or validate the data.

Metadata of deposited data must be open under a Creative Common Public Domain Dedication (CC 0) or equivalent (to the extent legitimate interests or constraints are safeguarded), in line with the FAIR principles (in particular machine-actionable) and provide information at least about the following: datasets (description, date of deposit, author(s) and embargo); Horizon Europe or Euratom funding; grant project name, acronym and number; licensing terms; persistent identifiers for the dataset, the authors involved in the action, and, if possible, for their organisations and the grant. Where applicable, the metadata must include persistent identifiers for related publications and other research outputs.

Open science: additional practices

Where the call conditions impose additional obligations regarding open science practices, the beneficiaries must also comply with those.

Where the call conditions impose additional obligations regarding the validation of scientific publications, the beneficiaries must provide (digital or physical) access to data or other results needed for validation of the conclusions of scientific publications, to the extent that their legitimate interests or constraints are safeguarded (and unless they already provided (open) access at publication).

Where the call conditions impose additional open science obligations in case of a public emergency, the beneficiaries must (if requested by the granting authority) immediately deposit any research output in a trusted repository and provide open access to it under a CC BY licence, a Public Domain Dedication (CC 0) or equivalent. As an exception, if the access would be against the beneficiaries' legitimate interests, the beneficiaries must grant non-exclusive licenses — under fair and reasonable conditions — to legal entities that need the research output to address the public emergency and commit to rapidly and broadly exploit the resulting products and services at fair and reasonable conditions. This provision applies up to four years after the end of the action (see Data Sheet, Point 1).

Plan for the exploitation and dissemination of results including communication activities

Unless excluded by the call conditions, the beneficiaries must provide and regularly update a plan for the exploitation and dissemination of results including communication activities.

SPECIFIC RULES FOR CARRYING OUT THE ACTION (— ARTICLE 18)

Implementation in case of restrictions due to strategic assets, interests, autonomy or security of the EU and its Member States

Where the call conditions restrict participation or control due to strategic assets, interests, autonomy or security, the beneficiaries must ensure that none of the entities that participate as affiliated entities, associated partners, third parties giving in-kind contributions, subcontractors or recipients of financial support to third parties are established in countries which are not eligible countries or target countries set out in the call conditions (or, if applicable, are controlled by such countries or entities from such countries) — unless otherwise agreed with the granting authority.

The beneficiaries must moreover ensure that any cooperation with entities established in countries which are not eligible countries or target countries set out in the call conditions (or, if applicable, are controlled by such countries or entities from such countries) does not affect the strategic assets, interests, autonomy or security of the EU and its Member States.

Recruitment and working conditions for researchers

The beneficiaries must take all measures to implement the principles set out in Annex II to the Council Recommendation on a European framework to attract and retain research, innovation and entrepreneurial talents in Europe[3] ('the European Charter for Researchers'), in particular regarding:

- working conditions
- transparent recruitment processes based on merit, and
- career development.

The beneficiaries must ensure that researchers and all participants involved in the action are aware of them.

Specific rules for access to research infrastructure activities

Definitions

Research Infrastructures — Facilities that provide resources and services for the research communities to conduct research and foster innovation in their fields. This definition includes the associated human resources, and it covers major equipment or sets of instruments; knowledge-related facilities such as collections, archives or scientific data infrastructures; computing systems, communication networks, and any other infrastructure, of a unique nature and open to external users, essential to achieve excellence in research and innovation. Where relevant, they may be used beyond research, for example for education or public services, and they may be 'single-sited', 'virtual' or 'distributed'[4]:

When implementing access to research infrastructure activities, the beneficiaries must respect the following conditions:

- for transnational access:
  - access which must be provided:

    The access must be free of charge, transnational access to research infrastructure or installations for selected user-groups.

    The access must include the logistical, technological and scientific support and the specific training that is usually provided to external researchers using the

[3] Council Recommendation C/2023/1640 of 18 December 2023 on a European framework to attract and retain research, innovation and entrepreneurial talents in Europe, Annex II (OJ C, C/2023/1640, 29.12.2023).

[4] See Article 2(1) of the Horizon Europe Framework Programme Regulation 2021/695.

infrastructure. Transnational access can be either in person (hands-on), provided to selected users that visit the installation to make use of it, or remote, through the provision to selected user-groups of remote scientific services (e.g. provision of reference materials or samples, remote access to a high-performance computing facility).

- categories of users that may have access:

  Transnational access must be provided to selected user-groups, i.e. teams of one or more researchers (users).

  The majority of the users must work in a country other than the country(ies) where the installation is located (unless access is provided by an international organisation, the Joint Research Centre (JRC), an ERIC or similar legal entity).

  Only user groups that are allowed to disseminate the results they have generated under the action may benefit from the access (unless the users are working for SMEs).

  Access for user groups with a majority of users not working in a EU Member State or Horizon Europe associated country is limited to 20% of the total amount of units of access provided under the grant (unless a higher percentage is foreseen in Annex 1).

- procedure and criteria for selecting user groups:

  The user groups must request access by submitting (in writing) a description of the work that they wish to carry out and the names, nationalities and home institutions of the users.

  The user groups must be selected by (one or more) selection panels set up by the consortium.

  The selection panels must be composed of international experts in the field, at least half of them independent from the consortium (unless otherwise specified in Annex 1).

  The selection panels must assess all proposals received and recommend a short-list of the user groups that should benefit from access.

  The selection panels must base their selection on scientific merit, taking into account that priority should be given to user groups composed of users who:

    - have not previously used the installation and
    - are working in countries where no equivalent research infrastructure exist.

  It will apply the principles of transparency, fairness and impartiality.

  Where the call conditions impose additional rules for the selection of user groups, the beneficiaries must also comply with those.

- other conditions:

The beneficiaries must request written approval from the granting authority for the selection of user groups requiring visits to the installations exceeding 3 months (unless such visits are foreseen in Annex 1).

In addition, the beneficiaries must:

- advertise widely, including on a their websites, the access offered under the Agreement
- promote equal opportunities in advertising the access and take into account the gender dimension when defining the support provided to users
- ensure that users comply with the terms and conditions of the Agreement
- ensure that its obligations under Articles 12, 13, 17 and 33 also apply to the users
- keep records of the names, nationalities, and home institutions of users, as well as the nature and quantity of access provided to them

- for virtual access:
  - access which must be provided:

    The access must be free of charge, virtual access to research infrastructure or installations.

    'Virtual access' means open and free access through communication networks to digital resources and services needed for research, without selecting the users to whom access is provided.

    The access must include the support that is usually provided to external users.

    Where allowed by the call conditions, beneficiaries may in justified cases define objective eligibility criteria (e.g. affiliation to a research or academic institution) for specific users.

  - other conditions:

    The beneficiaries must have the virtual access services assessed periodically by a board composed of international experts in the field, at least half of whom must be independent from the consortium (unless otherwise specified in Annex 1). For this purpose, information and statistics on the users and the nature and quantity of the access provided, must be made available to the board.

    The beneficiaries must advertise widely, including on a dedicated website, the access offered under the grant and the eligibility criteria, if any.

Where the call conditions impose additional traceability[5] obligations, information on the traceability of the users and the nature and quantity of access must be provided by the beneficiaries.

These obligations apply regardless of the form of funding or budget categories used to declare the costs (unit costs or actual costs or a combination of the two).

Specific rules for JU actions

JU actions must contribute to the long-term implementation of the JU partnership, including the JU Strategic Research and Innovation Agenda, the JU objectives and the exploitation of research and innovation results.

Moreover, when implementing JU actions, the members and contributing partners of the Joint Undertaking must fulfil their obligations regarding contributions to the Joint Undertaking:

- the description of the action in Annex 1 must include, for beneficiaries, affiliated entities, associated partners or other participants or third parties which are members or contributing partners, the estimated contributions to the action, i.e.:
    - in-kind contributions to operational activities ('IKOP'; if applicable)
    - in-kind contributions to additional activities linked to the action ('IKAA'; if applicable)
    - financial contributions ('FC'; if applicable)
- the in-kind contributions to operational activities and financial contributions must be reported during the implementation of the action in the Portal Continuous Reporting tool
- at the end of the action, the members and contributing partners that have not received funding under the grant must ensure that financial and in-kind contributions to operational activities of EUR 430 000 or more (see Article 21) are supported by statements of contributions (CS) and certificates on the statements of contributions (CCS) which fulfil the following conditions:
    - be provided by a qualified approved external auditor which is independent and complies with Directive 2006/43/EC (or for public bodies: by a competent independent public officer)
    - the verification must be carried out according to the highest professional standards to ensure that the statements of contributions comply with the provisions under the Agreement and the applicable JU Regulation, that the contributions cover activities that are part of the action and that they have not been reimbursed by the grant
- contributions must comply with the following conditions:

[5] According to the definition given in ISO 9000, i.e.: "Traceability is the ability to trace the history, application, use and location of an item or its characteristics through recorded identification data." The users can be traced, for example, by authentication and/or by authorization or by other means that allows for analysis of the type of users and the nature and quantity of access provided.

- costs covered by financial contributions cannot be claimed for reimbursement under the JU grant
- for Clean Aviation JU, SNS JU, Europe's Rail JU, CBE JU grants: if provided in the call conditions, a certain percentage of the total costs of the action must be covered by contributions (IKOP, IKAA or FC)
- for IHI JU grants: at least 45% (or another amount set out in the call conditions) of the total costs of the action and of the related IKAA must be covered by contributions (IKOP, IKAA or FC).

The beneficiaries must comply with the additional IPR, dissemination and exploitation obligations set out in the call conditions (Article 16 and Annex 5), in particular:

- for all JU grants: the granting authority right to object to transfers or licensing also applies to results generated by beneficiaries not having received funding under the grant
- for SESAR 3 JU and Clean Aviation JU grants: in view of the long innovation cycles:
  - the granting authority right to object to transfers or licensing (if any) can be exercised for up to 10 years after the end of the action (see Data Sheet, Point 1)
  - the beneficiaries must comply with their best effort obligation to exploit the results and any additional exploitation obligations imposed by the call conditions for up to 10 years after the end of the action (see Data Sheet, Point 1)
- for IHI JU and Global Health EDCTP3 JU grants (if applicable): the beneficiaries must ensure that the products and services that they develop based or partially based on the results of clinical studies undertaken as part of the grant are affordable, available and accessible to the public at fair and reasonable conditions.

In addition to the obligations set out in Article 17, communication and dissemination activities as well as infrastructure, equipment or major results funded under JU actions must moreover display the Joint Undertaking's special logo:

Circular Bio-based Europe Joint Undertaking

Clean Hydrogen Partnership

innovative health initiative

Global Health EDCTP3

and the following text:

> "The project is supported by the [insert JU name] and its members *[OPTION for actions with national contribution top-ups:* (including top-up funding by [name of the national funding authority])*]*."

For Clean Aviation and SNS JU grants, where imposed by the call conditions, the beneficiaries must — before grant signature (or another date specified in the call conditions or agreed with the granting authority) — adhere to a written agreement based on the model set up by the Joint Undertaking, in order to ensure best possible coordination and a programmatic approach amongst all the JU funded actions to achieve the Programme's objectives.

The agreement will set a framework and cover areas where close cooperation and coordination is needed (e.g. sharing of information, management of outputs, common approaches towards standardisation, common communication and dissemination activities, links with regulatory and policy activities, contribution to the impact monitoring, access to results and background, etc.) and define the rules for this cooperation (e.g. dispute settlement mechanisms, confidentiality arrangements, indemnification, etc).

The agreement should be signed by the coordinators in the name of their consortia (or by all the beneficiaries where imposed by the call conditions) of all JU funded actions and in line with the accession modalities set out in the agreement, and thus create a partnership between all participants of closed and ongoing JU funded actions, including actions funded under the same or different calls.

For EuroHPC and Chips JU grants, the beneficiaries must respect the following conditions when implementing actions with national contribution top-ups from Participating States:

- the beneficiaries must ensure visibility of the national contributions (see below)
- the payment deadlines for prefinancing, interim or final payments are automatically suspended if a national funding authority is late with its payments to the Joint Undertaking for the national contribution top-up
- the European Anti-Fraud Office (OLAF), European Public Prosecutor's Office (EPPO), European Court of Auditors (ECA), the National Court of Auditors and other national authorities can exercise their control rights on the project implementation and costs declared, including for the national contribution top-up.

For SNS JU grants, where imposed by the call conditions for digital infrastructure projects, the beneficiaries must ensure that the network technologies and equipment (including software and services) funded by the action comply with the security requirements and assessments as reflected in the applicable EU, international and national law on cybersecurity and on data protection.

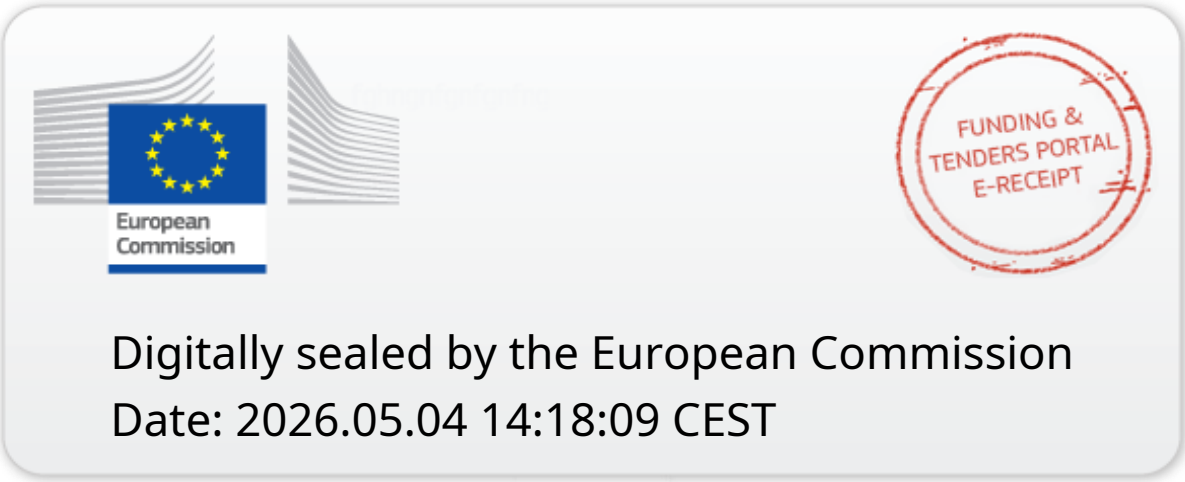
Moreover, where the call conditions impose wholesale access obligations, the beneficiaries must provide wholesale access to the digital infrastructure funded by the action, under fair and reasonable conditions, in a non-discriminatory manner and in accordance with the call conditions.

For Global Health EDCTP3 JU fellowship grants, the beneficiaries must respect the following conditions when implementing them through financial support to third parties:

- avoid any conflict of interest and comply with the principles of transparency, non-discrimination and sound financial management
- take all measures to implement the principles set out in the European Charter for Researchers and ensure that the researchers and all participants involved in the action are aware of them
- ensure that the researchers enjoy at the place of the implementation at least the same standards and working conditions as those applicable to local researchers holding a similar position
- ensure that the other direct contract or fixed-amount-fellowship agreement specifies:
    - the name of the supervisor(s) and/or mentor(s) for the research and training activities
    - the starting date and duration of the research and training activities
    - the monthly support for the researcher under this Agreement (in euro and, if relevant, in the currency in which the remuneration is paid)
    - the obligation of the researcher to work exclusively for the action, unless part-time has been approved and not to receive, for activities carried out in the frame of the action, other incomes than those received from the beneficiary or other entities mentioned in Annex 1)
    - the working pattern of the researcher

  - the arrangements related to the intellectual property rights (during implementation of the action and afterwards), in particular full access — on a royalty-free basis — for the researcher to background and results needed for their activities under the action
  - the obligation of the researcher to inform as soon as possible about events or circumstances likely to affect the implementation of the action or the compliance with requirements under the Agreement (see Article 19)
  - the obligation of the researcher to maintain confidentiality (see Article 13)
  - the obligation of the researcher to ensure the visibility of the EDCTP Association and EU funding in communications or publications and in applications for the protection of results (see Articles 17)
  - where set out in the call conditions, the obligation of the researcher to carry out a mandatory return period of 12 months
- assist the researchers in the administrative procedures related to the recruitment
- inform the researchers about:
  - the description, conditions, location and timetable for the implementation of the research and training activities
  - the rights and obligations toward the researchers under this Agreement
  - the obligation of the researchers to complete and submit — at the end of the research training activities — the evaluation questionnaire and — two years later — follow-up questionnaire provided by the granting authority
- ensure full access — on a royalty-free basis — for the researchers to background and results needed for their activities under the action
- ensure that the researchers do not have to bear any costs for the implementation of the action as described in Annex 1
- provide training, infrastructure and the necessary means for implementing the action (or ensure that such training and means are provided by other participants in the action)
- ensure that the researchers are adequately supervised and receive appropriate career guidance
- ensure that personalised career development plans are established, support their implementation and update in view of the needs of the researchers
- ensure an appropriate exposure to the non-academic sector (if applicable)
- respect the maximum limit for secondments set out in the call conditions (if applicable)
- respect the conditions for the outgoing and return phases set out in the call conditions (if any)

- ensure that the researchers are informed that they are ‘Global Health EDCTP3 JU fellows’
- ensure that the researchers do not receive, for activities carried out in the frame of the action, other incomes than those received from the beneficiaries (or other entities mentioned in Annex 1)
- host the researchers at their premises (or at the premises of other participants in the action).



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