



GRANT AGREEMENT

Project 101288156 — NEURON

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':

INDRA SISTEMAS SA (INDRA), PIC 999959130, established in AVENIDA DE BRUSELAS 35, ALCOBENDAS MADRID 28108, Spain,

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

2. **STICHTING KONINKLIJK NEDERLANDS LUCHT - EN RUIMTEVAARTCENTRUM (NLR)**, PIC 999987066, established in ANTHONY FOKKERWEG 2, AMSTERDAM 1059 CM, Netherlands,

3. **AP-TECH SP. Z O.O. (AP-Tech)**, PIC 885702054, established in ZAGLOBY 5, ZAMOSC 22-400, Poland,

4. **ATHENS INTERNATIONAL AIRPORT S.A. (AIA)**, PIC 999484994, established in ODOS SPATA ATTIKIS, SPATA 190 19, Greece,

5. **AEROPORTS DE PARIS SA (ADP)**, PIC 957080474, established in 1 RUE DE FRANCE, TREMBLAY-EN-FRANCE 93290, France,

6. **SCHIPHOL NEDERLAND BV (SNBV)**, PIC 999931388, established in EVERT VAN DE BEEKSTRAAT 202, LUCHTHAVEN SCHIPHOL 1118 ZG, Netherlands,

7. **AVINOR AS (AVINOR)**, PIC 938275375, established in DRONNING EUFEMIAS GATE 6, OSLO 0191, Norway,

8. **KOBENHAVNS LUFTHAVNE AS (CPH)**, PIC 950806223, established in LUFTHAVNSBOULEVARDEN, KASTRUP 2770, Denmark,

9. **PORT LOTNICZY GDANSK SP ZOO (GDN)**, PIC 905290040, established in Słowackiego 200, Gdansk 80-298, Poland,
10. **PORT LOTNICZY WROCLAW SA (PLW)**, PIC 888386529, established in UL. GRANICZNA 190, WROCLAW 54-530, Poland,
11. **GOLDAIR EXYPIRETISEIS EDAFOUS ANONIMI ETAIREIA (GOLDAIR)**, PIC 952207194, established in DAA EL VENIZELOS KTIRIO 24, SPATA 190 19, Greece,
12. **EUROCONTROL - EUROPEAN ORGANISATION FOR THE SAFETY OF AIR NAVIGATION (EUROCONTROL)**, PIC 999483733, established in Rue de la Fusée 96, BRUXELLES 1130, Belgium,
13. **HUNGAROCONTROL MAGYAR LEGIFORGALMISZOLGALAT ZARTKORUEN MUKODO RESZVENYTARSASAG (HUNGAROCONTROL)**, PIC 941767472, established in IGLO UTCA 33 35, BUDAPEST 1185, Hungary,
14. **DIRECTION DES SERVICES DE LA NAVIGATION AERIENNE (DSNA)**, PIC 928673636, established in 50 RUE HENRY FARMAN, PARIS 75720, France,
15. **LUFTFARTSVERKET (LFV)**, PIC 942346077, established in HOSPITALSGATAN 30, NORRKOPING 602 27, Sweden,
16. **POLSKA AGENCJA ZEGLUGI POWIETRZNEJ (PANS)**, PIC 995562023, established in UL. WIEZOWA 8, WARSZAWA 02 147, Poland,
17. **AIRBUS (AIRBUS SAS)**, PIC 999963010, established in 2 ROND POINT EMILE DEWOITINE, BLAGNAC 31700, France,
18. **AIRBUS OPERATIONS SAS (AIRBUS OPS)**, PIC 991247948, established in ROUTE DE BAYONNE 316, TOULOUSE 31060, France,
19. **ENAV SPA (ENAV)**, PIC 998197513, established in VIA SALARIA 716, ROMA 00138, Italy,
20. **ENAI (ENAI)**, PIC 997701843, established in AVENIDA DE ARAGON S/N BLOQUE 330, PORTAL 2 PARQUE EMPRESARIAL LAS MERCEDES, MADRID 28022, Spain,
21. **PILDO CONSULTING SL (PILDO)**, PIC 998162690, established in c/ Bac de Roda 120 (Local 2), BARCELONA 08019, Spain,
22. **NEXT INGEGNERIA DEI SISTEMI SPA (NEXT)**, PIC 996607489, established in VIA GIACOMO PERONI 452, ROMA 00131, Italy,
23. **DEUTSCHES ZENTRUM FUR LUFT - UND RAUMFAHRT EV (DLR)**, PIC 999981731, established in LINDER HOHE, KOLN 51147, Germany,
24. **ECOLE NATIONALE DE L AVIATION CIVILE (ENAC)**, PIC 996375756, established in AVENUE EDOUARD BELIN 7, TOULOUSE 31400, France,
25. **DEEP BLUE SRL (DBL)**, PIC 998325941, established in VIA DANIELE MANIN 53, ROMA 00185, Italy,

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 action¹

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

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DATA SHEET

1. General data

Project summary:

Project summary
NEURON (NEW aiRport Operational service Network) aims to design, develop and validate a next-generation airport platform that enhances operational efficiency, safety, and sustainability through advanced automation and AI. The project delivers four integrated solutions up to TRL6, each addressing a critical operational gap in airport and network performance. Solution 1 introduces sustainable taxiing operations via the Tug Fleet Manager and Dynamic Taxi Tool, enabling single-engine and engine-off towing strategies to reduce fuel burn, CO2 emissions, and ATCO workload while improving taxi-time predictability. Solution 2 develops the Surface Movement Awareness System (SMAS), a cost-effective, modular and cloud-ready surveillance platform for small and medium airports, integrating GNSS monitoring, fallback modes for degraded A-SMGCS, and AI-based links to the Network Manager. Solution 3 delivers AI-enabled visual intelligence for digital towers, combining real-time tracking, trajectory smoothing, video-based weather detection and aerodrome safety monitoring, enhancing human-machine teaming in remote tower operations. Solution 4 advances the Airport Operations Plan (AOP) with holistic Demand-Capacity Balancing across landside/airside processes and seamless AOP-NOP integration, including AI-based predictors for flights, passengers, and baggage, plus QUANT data-quality monitoring. NEURON is industry-led and operator-driven, with strong vendor participation (INDRA, AP-Tech, ENAV/TechnoSky, Airbus, SMEs) and early-adopter airports and ANSPs providing realistic validation environments. Coordinated by INDRA, and supported by EUROCONTROL as network integrator, NEURON ensures that its results are exploitable, standardisation-ready, and aligned with SESAR's Digital European Sky vision.

Keywords:

- Airport, AOP, AI, NOP, Service, RMS, AODB, CDM, ASMGCS, SMAS

Project number: 101288156

Project name: NEW aiRport Operational service Network

Project acronym: NEURON

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

Topic: HORIZON-SESAR-2025-DES-IR-02-WA4-1

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: first day of the month following the entry into force date

Project end date: starting date + months of duration

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	INDRA	INDRA SISTEMAS SA	ES	999959130	2 795 193.68
1.1	AE	INDRA NAVIA	INDRA NAVIA AS	NO	952375586	1 416 345.24
1.2	AE	MINSAIT	INDRA SOLUCIONES TECNOLOGIAS DE LA INFORMACION SL	ES	904539842	317 821.00
2	BEN	NLR	STICHTING KONINKLIJK NEDERLANDS LUCHT - EN RUIMTEVAARTCENTRUM	NL	999987066	456 862.21

N°	Role	Short name	Legal name	Ctry	PIC	Max grant amount
3	BEN	AP-Tech	AP-TECH SP. Z O.O.	PL	885702054	1 132 678.75
4	BEN	AIA	ATHENS INTERNATIONAL AIRPORT S.A.	EL	999484994	723 712.50
5	BEN	ADP	AEROPORTS DE PARIS SA	FR	957080474	432 180.00
6	BEN	SNBV	SCHIPHOL NEDERLAND BV	NL	999931388	580 475.00
7	BEN	AVINOR	AVINOR AS	NO	938275375	192 715.86
8	BEN	CPH	KOBENHAVNS LUFTHAVNE AS	DK	950806223	74 550.00
9	BEN	GDN	PORT LOTNICZY GDANSK SP ZOO	PL	905290040	123 910.94
10	BEN	PLW	PORT LOTNICZY WROCLAW SA	PL	888386529	123 904.38
11	BEN	GOLDAIR	GOLDAIR EXYPIRETISEIS EDAFOUS ANONIMI ETAIREIA	EL	952207194	179 375.00
12	BEN (IO)	EUROCONTROL	EUROCONTROL - EUROPEAN ORGANISATION FOR THE SAFETY OF AIR NAVIGATION	BE	999483733	0.00
13	BEN	HUNGAROCNTR	HUNGAROCNTR MAGYAR LEGIFORGALMISZOLGALAT ZARTKORUEN MUKODO RESZVENYTARSASAG	HU	941767472	82 400.23
14	BEN	DSNA	DIRECTION DES SERVICES DE LA NAVIGATION AERIENNE	FR	928673636	621 026.70
15	BEN	LFV	LUFTFARTSVERKET	SE	942346077	320 599.22
16	BEN	PANSA	POLSKA AGENCJA ZEGLUGI POWIETRZNEJ	PL	995562023	270 112.50
17	BEN	AIRBUS SAS	AIRBUS	FR	999963010	41 049.31
18	BEN	AIRBUS OPS	AIRBUS OPERATIONS SAS	FR	991247948	53 476.94
19	BEN	ENAV	ENAV SPA	IT	998197513	180 800.83
19.1	AE	TECHNO SKY	TECHNO SKY SRL TECHNOLOGIES FOR AIR TRAFFIC MANAGEMENT	IT	941608877	192 668.88
20	BEN	ENAI	ENAI	ES	997701843	59 062.50
20.1	AE	CRIDA	CENTRO DE REFERENCIA INVESTIGACION DESARROLLO E INNOVACION ATM, A.I.E.	ES	997605619	99 968.75
21	BEN	PILDO	PILDO CONSULTING SL	ES	998162690	130 025.00
22	BEN	NEXT	NEXT INGEGNERIA DEI SISTEMI SPA	IT	996607489	191 683.63
23	BEN	DLR	DEUTSCHES ZENTRUM FUR LUFT - UND RAUMFAHRT EV	DE	999981731	565 889.17
24	BEN	ENAC	ECOLE NATIONALE DE L AVIATION CIVILE	FR	996375756	220 325.00
25	BEN	DBL	DEEP BLUE SRL	IT	998325941	357 000.00
Total						11 935 813.22

Coordinator:

— INDRA SISTEMAS SA (INDRA)

3. Grant**Maximum grant amount, total estimated eligible costs and contributions and funding rate:**

Maximum grant amount (Annex 2)	Maximum grant amount (award decision)
11 935 813.22	11 935 813.22

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
					Interim payment	90 days from receiving periodic report
1	1	18	Periodic report	60 days after end of reporting period	Final payment	90 days from receiving periodic report
2	19	36	Periodic report	60 days after end of reporting period		

Prefinancing payments and guarantees:

Prefinancing payment	
Type	Amount
Prefinancing 1 (initial)	7 161 487.93

Reporting and payment modalities (art 21, 22):

Mutual Insurance Mechanism (MIM): Yes

MIM contribution: 5% of the maximum grant amount (596 790.66), 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 conditions (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:

ES5700491500042710383419 BSCHESMMXXX

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

Special applicable law regime:

- EUROCONTROL - EUROPEAN ORGANISATION FOR THE SAFETY OF AIR NAVIGATION (EUROCONTROL): general principles governing the law of international organisations and the general rules of international law

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)

Special dispute settlement forum:

- EUROCONTROL - EUROPEAN ORGANISATION FOR THE SAFETY OF AIR NAVIGATION (EUROCONTROL): Arbitration

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 2024/2509⁴ 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 2017/1371⁵ and Article 1 of the Convention on the protection of the European Communities' financial interests, drawn up by the Council Act of 26 July 1995⁶, 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 2988/95⁷.

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 2024/2509⁸.

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 **101288156 — NEURON** ('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 grant⁹ 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

The following entities which are linked to a beneficiary will participate in the action as ‘affiliated entities’:

- **INDRA NAVIA AS (INDRA NAVIA)**, PIC 952375586, linked to INDRA SISTEMAS SA (INDRA)
- **INDRA SOLUCIONES TECNOLOGIAS DE LA INFORMACION SL (MINSAIT)**, PIC 904539842, linked to INDRA SISTEMAS SA (INDRA)
- **TECHNO SKY SRL TECHNOLOGIES FOR AIR TRAFFIC MANAGEMENT (TECHNO SKY)**, PIC 941608877, linked to ENAV SPA (ENAV)
- **CENTRO DE REFERENCIA INVESTIGACION DESARROLLO E INNOVACION ATM, A.I.E. (CRIDA)**, PIC 997605619, linked to ENAIRE (ENAIRE)

Affiliated entities can charge lump sum contributions to the action under the same conditions as the

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.”

beneficiaries and must implement the action tasks attributed to them in Annex 1 in accordance with Article 11.

Their contributions will be included in Annex 2 and will be taken into account for the calculation of the grant.

The beneficiaries must ensure that all their obligations under this Agreement also apply to their affiliated entities.

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 affiliated entities.

Breaches by affiliated entities will be handled in the same manner as breaches by beneficiaries. Recovery of undue amounts will be handled through the beneficiaries.

If the granting authority requires joint and several liability of affiliated entities (see Data Sheet, Point 4.4), they must sign the declaration set out in Annex 3a and may be held liable in case of enforced recoveries against their beneficiaries (see Article 22.2 and 22.4).

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.

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/EC¹²
- 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.).

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/EC¹³
- for the controls under Article 25: to allow for the checks, reviews, audits and investigations

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).

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).

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 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 2015/444¹⁴ and its implementing rules).

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 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).

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 2018/1725¹⁵.

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 2016/679¹⁶).

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

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).

- 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

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):



Funded by the
European Union



Co-funded by the
European Union



Funded by the
European Union



Co-funded by the
European Union

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:

$$\begin{aligned} &\{\text{total accepted EU contribution for the beneficiary} \\ &\text{minus} \\ &\{\text{prefinancing and interim payments received (if any)}\} \}. \end{aligned}$$

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:

$$\begin{aligned} &\{\text{final grant amount} \\ &\text{minus} \\ &\{\text{prefinancing and interim payments made (if any)}\}\}. \end{aligned}$$

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:

$$\left\{ \left\{ \begin{array}{l} \text{total accepted EU contribution for the beneficiary} \\ \text{divided by} \\ \text{total accepted EU contribution for the action} \end{array} \right\} \times \begin{array}{l} \text{final grant amount for the action} \\ \text{minus} \\ \text{prefinancing and interim payments received by the beneficiary (if any)} \end{array} \right\}$$

and

(b) dividing the debt:

$$\left\{ \begin{array}{l} \text{amount calculated according to point (a) for the beneficiary concerned} \\ \text{divided by} \\ \text{the sum of the amounts calculated according to point (a) for all the beneficiaries identified according to point (a)} \\ \text{multiplied by} \\ \text{the amount to be recovered} \end{array} \right\}.$$

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:

$$\left\{ \begin{array}{l} \text{total accepted EU contribution for the beneficiary} \\ \text{divided by} \\ \text{total accepted EU contribution for the action} \end{array} \right\} \times \text{final grant amount for the action}$$

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 2015/2366¹⁷ 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

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).

22.5.1 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.

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 883/2013¹⁸ and No 2185/96¹⁹
- 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.

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).

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

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 2988/95²⁰).

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.

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).

‘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’).

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 1182/71²¹, 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.

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).

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.

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

For the granting authority



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:	101288156
Project name:	NEw aiRport Operational service Network
Project acronym:	NEURON
Call:	HORIZON-SESAR-2025-DES-IR-02
Topic:	HORIZON-SESAR-2025-DES-IR-02-WA4-1
Type of action:	HORIZON-JU-RIA
Service:	SESAR
Project starting date:	first day of the month following the entry into force date
Project duration:	36 months

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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.

NEURON (New aiRport Operational service Network) aims to design, develop and validate a next-generation airport platform that enhances operational efficiency, safety, and sustainability through advanced automation and AI. The project delivers four integrated solutions up to TRL6, each addressing a critical operational gap in airport and network performance.

Solution 1 introduces sustainable taxiing operations via the Tug Fleet Manager and Dynamic Taxi Tool, enabling single-engine and engine-off towing strategies to reduce fuel burn, CO2 emissions, and ATCO workload while improving taxi-time predictability.

Solution 2 develops the Surface Movement Awareness System (SMAS), a cost-effective, modular and cloud-ready surveillance platform for small and medium airports, integrating GNSS monitoring, fallback modes for degraded A-SMGCS, and AI-based links to the Network Manager.

Solution 3 delivers AI-enabled visual intelligence for digital towers, combining real-time tracking, trajectory smoothing, video-based weather detection and aerodrome safety monitoring, enhancing human-machine teaming in remote tower operations.

Solution 4 advances the Airport Operations Plan (AOP) with holistic Demand-Capacity Balancing across landside/airside processes and seamless AOP–NOP integration, including AI-based predictors for flights, passengers, and baggage, plus QUANT data-quality monitoring.

NEURON is industry-led and operator-driven, with strong vendor participation (INDRA, AP-Tech, ENAV/TechnoSky, Airbus, SMEs) and early-adopter airports and ANSPs providing realistic validation environments. Coordinated by INDRA, and supported by EUROCONTROL as network integrator, NEURON ensures that its results are exploitable, standardisation-ready, and aligned with SESAR's Digital European Sky vision.

LIST OF PARTICIPANTS

PARTICIPANTS

Grant Preparation (Beneficiaries screen) — Enter the info.

Number	Role	Short name	Legal name	Country	PIC
1	COO	INDRA	INDRA SISTEMAS SA	ES	999959130
1.1	AE	INDRA NAVIA	INDRA NAVIA AS	NO	952375586
1.2	AE	MINSAIT	INDRA SOLUCIONES TECNOLOGIAS DE LA INFORMACION SL	ES	904539842
2	BEN	NLR	STICHTING KONINKLIJK NEDERLANDS LUCHT - EN RUIMTEVAARTCENTRUM	NL	999987066
3	BEN	AP-Tech	AP-TECH SP. Z O.O.	PL	885702054
4	BEN	AIA	ATHENS INTERNATIONAL AIRPORT S.A.	EL	999484994
5	BEN	ADP	AEROPORTS DE PARIS SA	FR	957080474
6	BEN	SNBV	SCHIPHOL NEDERLAND BV	NL	999931388
7	BEN	AVINOR	AVINOR AS	NO	938275375

PARTICIPANTS*Grant Preparation (Beneficiaries screen) — Enter the info.*

Number	Role	Short name	Legal name	Country	PIC
8	BEN	CPH	KOBENHAVNS LUFTHAVNE AS	DK	950806223
9	BEN	GDN	PORT LOTNICZY GDANSK SP ZOO	PL	905290040
10	BEN	PLW	PORT LOTNICZY WROCLAW SA	PL	888386529
11	BEN	GOLDAIR	GOLDAIR EXYPIRETISEIS EDAFOUS ANONIMI ETAIREIA	EL	952207194
12	BEN	EUROCONTROL	EUROCONTROL - EUROPEAN ORGANISATION FOR THE SAFETY OF AIR NAVIGATION	BE	999483733
13	BEN	HUNGAROCONTR	HUNGAROCONTROL MAGYAR LEGIFORGALMISZOLGALAT ZARTKORUEN MUKODO RESZVENYTARSASAG	HU	941767472
14	BEN	DSNA	DIRECTION DES SERVICES DE LA NAVIGATION AERIENNE	FR	928673636
15	BEN	LFV	LUFTFARTSVERKET	SE	942346077
16	BEN	PANSA	POLSKA AGENCJA ZEGLUGI POWIETRZNEJ	PL	995562023
17	BEN	AIRBUS SAS	AIRBUS	FR	999963010
18	BEN	AIRBUS OPS	AIRBUS OPERATIONS SAS	FR	991247948
19	BEN	ENAV	ENAV SPA	IT	998197513
19.1	AE	TECHNO SKY	TECHNO SKY SRL TECHNOLOGIES FOR AIR TRAFFIC MANAGEMENT	IT	941608877
20	BEN	ENAIRES	ENAIRES	ES	997701843
20.1	AE	CRIDA	CENTRO DE REFERENCIA INVESTIGACION DESARROLLO E INNOVACION ATM, A.I.E.	ES	997605619
21	BEN	PILDO	PILDO CONSULTING SL	ES	998162690
22	BEN	NEXT	NEXT INGEGNERIA DEI SISTEMI SPA	IT	996607489
23	BEN	DLR	DEUTSCHES ZENTRUM FUR LUFT - UND RAUMFAHRT EV	DE	999981731
24	BEN	ENAC	ECOLE NATIONALE DE L AVIATION CIVILE	FR	996375756
25	BEN	DBL	DEEP BLUE SRL	IT	998325941

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 Period 1	1 - INDRA	31.09	1	18	D1.1 – Project Management Plan (PMP) D1.2 – Data Management Plan (DMP) D1.3 – PMP v2 D1.4 – DMP v2
WP2	Project Management Period 2	1 - INDRA	27.51	19	36	D2.1 – DMP v3
WP3	Solution 1 - Integrated management of sustainable taxiing operations at the airport. Period 1	2 - NLR	168.00	1	18	D3.1 – STAND v1.0 (Sol1) D3.2 – REG v1.0 (Sol1) D3.3 – STAND v2.0 (Sol1) D3.4 – REG v2.0 (Sol1) D3.5 – TS/IRS v1.0 (Sol1) D3.6 – TRL4 OSED v1.0 (Sol1) D3.7 – TRL4 VALP v1.0 (Sol1) D3.8 – TRL4 OSED v2.0 (Sol1) D3.9 – TRL4 VALP v2.0 (Sol1) D3.10 – TS/IRS v.2.0 (Sol 1)
WP4	Solution 1 - Integrated management of sustainable taxiing operations at the airport. Period 2	2 - NLR	227.00	19	36	D4.1 – STAND v3.0 (Sol1) D4.2 – REG v3.0 (Sol1) D4.3 – OSED v3.0 (Sol1) D4.4 – VALR v1.0 (Sol1) D4.5 – CBA v1.0 (Sol1) D4.6 – TRL6 VALP (Sol1) D4.7 – OSED v4.0 (Sol1) D4.8 – TS/IRS v3.0 (Sol1) D4.9 – VALR v2.0 (Sol1) D4.10 – TRL6 OSED v4.0 (Sol1) D4.11 – TS/IRS v4.0 (Sol1)

Work packages						
<i>Grant Preparation (Work Packages screen) — Enter the info.</i>						
Work Package No	Work Package name	Lead Beneficiary	Effort (Person-Months)	Start Month	End Month	Deliverables
						D4.12 – STAND v4.0 (Sol1) D4.13 – REG v4.0 (Sol1) D4.14 – CBA v2.0 (Sol1) D4.15 – CN (Sol1)
WP5	Solution 2: Cost-effective Aerodrome traffic awareness integrated with AI-Powered NM tools. Period 1	3 - AP-Tech	178.65	1	18	D5.1 – STAND v1.0 (Sol2) D5.2 – REG v1.0 (Sol2) D5.3 – STAND v2.0 (Sol2) D5.4 – REG v2.0 (Sol2) D5.5 – TS/IRS v1.0 (Sol2) D5.6 – VALP v1.0 (Sol2) D5.7 – OSED v1.0 (Sol2) D5.8 – OSED v2.0 (Sol2) D5.9 – TS/IRS v2.0 (Sol2) D5.10 – VALP v2.0 (Sol2)
WP6	Solution 2: Cost-effective Aerodrome traffic awareness integrated with AI-Powered NM tools. Period 2	3 - AP-Tech	197.35	19	36	D6.1 – STAND v3.0 (Sol2) D6.2 – REG v3.0 (Sol2) D6.3 – OSED v3.0 (Sol2) D6.4 – TS/IRS v3.0 (Sol2) D6.5 – CBA v1.0 (Sol2) D6.6 – VALP v3.0 (Sol2) D6.7 – VALR (Sol2) D6.8 – OSED v4.0 (Sol2) D6.9 – TS/IRS v4.0 (Sol2) D6.10 – STAND v4.0 (Sol2) D6.11 – REG v4.0 (Sol2) D6.12 – CBA v2.0 (Sol2) D6.13 – CN (Sol2)
WP7	Solution 3: AI automated tracking for digital towers and aerodrome operations. Period 1	1 - INDRA	177.50	1	18	D7.1 – STAND v1.0 (Sol3) D7.2 – REG v1.0 (Sol3)

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
						D7.3 – STAND v2.0 (Sol3) D7.4 – REG v2.0 (Sol3) D7.5 – TS/IRS v1.0 (Sol3) D7.6 – VALP v1.0 (Sol3) D7.7 – OSED v1.0 (Sol3)
WP8	Solution 3: AI automated tracking for digital towers and aerodrome operations. Period 2	1 - INDRA	228.75	19	36	D8.1 – STAND v3.0 (Sol3) D8.2 – REG v3.0 (Sol3) D8.3 – OSED v2.0 (Sol3) D8.4 – TS/IRS v2.0 (Sol3) D8.5 – CBA v1.0 (Sol3) D8.6 – VALP v2.0 (Sol3) D8.7 – VALR (Sol3) D8.8 – OSED v3.0 (Sol3) D8.9 – TS/IRS v3.0 (Sol3) D8.10 – STAND v4.0 (Sol3) D8.11 – REG v4.0 (Sol3) D8.12 – CBA v2.0 (Sol3) D8.13 – CN (Sol3)
WP9	Solution 4: Advanced AOP & Airport-Network Integration. Period 1	4 - AIA	201.50	1	18	D9.1 – STAND v1.0 (Sol4) D9.2 – REG v1.0 (Sol4) D9.3 – STAND v2.0 (Sol4) D9.4 – REG v2.0 (Sol4) D9.5 – TS/IRS v1.0 (Sol4) D9.6 – OSED v1.0 (Sol4) D9.7 – VALP v1.0 (Sol4)
WP10	Solution 4: Advanced AOP & Airport-Network Integration. Period 2	4 - AIA	220.50	19	36	D10.1 – STAND v3.0 (Sol4) D10.2 – REG v3.0 (Sol4) D10.3 – OSED v2.0 (Sol4) D10.4 – TS/IRS v2.0 (Sol4)

Work packages <i>Grant Preparation (Work Packages screen) — Enter the info.</i>						
Work Package No	Work Package name	Lead Beneficiary	Effort (Person-Months)	Start Month	End Month	Deliverables
						D10.5 – CBA v1.0 (Sol4) D10.6 – VALP v2.0 (Sol4) D10.7 – VALR (Sol4) D10.8 – OSED v3.0 (Sol4) D10.9 – TS/IRS v3.0 (Sol4) D10.10 – STAND v4.0 (Sol4) D10.11 – REG v4.0 (Sol4) D10.12 – CBA v2.0 (Sol4) D10.13 – CN (Sol4)
WP11	Communication, Dissemination and Exploitation. Period 1	1 - INDRA	16.00	1	18	D11.1 – CDE Plan v1.0 D11.2 – CDE Plan v2.0
WP12	Communication, Dissemination and Exploitation. Period 2	1 - INDRA	23.30	19	36	D12.1 – CDE Plan 3.0 D12.2 – CDE Plan v4.0

Work package WP1 – Project Management Period 1

Work Package Number	WP1	Lead Beneficiary	1 - INDRA
Work Package Name	Project Management Period 1		
Start Month	1	End Month	18

Objectives
Ensure effective coordination, quality, risk and reporting in line with SESAR 3 JU and HE lump-sum rules; deliver PMP/ DMP and inputs for Review 1 and period reporting.

Description
T1.01 Coordination and SESAR 3 JU Interface (Lead: INDRA Contributor(s): NLR, AP-Tech, AIA): Day-to-day governance and partner comms; PMP preparation/updates; liaison with SESAR JU; internal material for Project Review 1 (≈M9); HE Technical & Financial Report 1. Deliverables: D1.1 and D1.3 T1.02 Risk and Issue Management (Lead: INDRA Contributor(s): NLR, AP-Tech, AIA): Maintain SESAR risk governance and log; assess likelihood/severity; implement/track mitigations; escalate when needed. T1.03 Quality Management (Lead: INDRA Contributor(s): NLR, AP-Tech, AIA): QA procedures for deliverables; peer reviews; quality KPIs and corrective actions per SESAR Handbook. T1.04 Definition of Service Delivery Model and Cybersecurity framework (Lead: INDRA Contributor(s): MINSAIT, NLR, AP-Tech, AIA): This task is responsible for defining, at project level, the target Service Delivery Model (SDM) – including its service-oriented architecture, open and standardised interfaces, and deployment strategy – as well as the overarching cybersecurity framework and the baseline requirements for key security attributes. The main objective is to provide a unified reference for the entire project, ensuring that all solutions share a common understanding and are consistently aligned in terms of service delivery and cybersecurity. This task will Produce a “technical document” (no specific SESAR template required), to be added as an annex to the TS/IRS for each solution. When developing each individual TS/IRS, it should refer to or extract information from this annex (typically to define the requirements). T1.05 Content Integration and Planning Alignment (Lead: INDRA Contributor(s): NLR, AP-Tech, AIA): Ensure cross-WP consistency and alignment with the European ATM Master Plan; integrate inputs (e.g., VALP/VALR, CBA, STAND/REG) for reviews and SESAR planning. T1.06 Data Management Plan (DMP) (Lead: INDRA Contributor(s): NLR, AP-Tech, AIA): This task covers the preparation, submission and update of the Data Management Plan (DMP), in line with Horizon Europe and SESAR 3 JU requirements and follow FAIR principles. Deliverables: D1.2 and D1.4

Work package WP2 – Project Management Period 2

Work Package Number	WP2	Lead Beneficiary	1 - INDRA
Work Package Name	Project Management Period 2		
Start Month	19	End Month	36

Objectives
Coordinate final implementation, consolidate results and evidence packages, manage residual risks and QA, and deliver project closure (reports, release integration) per SESAR/HE requirements.

Description
T2.01 Project Coordination and Reporting (Lead: INDRA Contributor(s): NLR, AP-Tech, AIA): governance and SESAR JU interface; internal material for Project Review 2 (≈M21); final admin/financial deliverables incl. HE TF Final Report. T2.02 Risk and Issue Management (continued T1.2) (Lead: INDRA Contributor(s): NLR, AP-Tech, AIA). T2.03 Quality and Impact Monitoring (continued T1.3) (Lead: INDRA Contributor(s): NLR, AP-Tech, AIA). T2.04 Definition of Service Delivery Model and Cybersecurity framework (continued T1.4) (Lead: INDRA Contributor(s): NLR, AP-Tech, AIA). This task will evolve the document coming from WP1 T1.04. This updated

“technical document” (no specific SESAR template required), will be added as an annex to the TS/IRS for each solution. When developing each individual TS/IRS, it should refer to or extract information from this annex

T2.05 Content Consolidation and Project Closure (Lead: INDRA | Contributor(s): NLR, AP-Tech, AIA): Integrate cross-solution outputs; align with SESAR release cycles; prepare Project Final Report and lessons learned.

T2.06 DMP Final Update and Data Archiving (Lead: INDRA | Contributor(s): NLR, AP-Tech, AIA): Finalise DMP; FAIR archiving to SESAR Library/Zenodo/STELLAR; define post-project data governance where applicable. Deliverables: D2.1

Work package WP3 – Solution 1 - Integrated management of sustainable taxiing operations at the airport. Period 1

Work Package Number	WP3	Lead Beneficiary	2 - NLR
Work Package Name	Solution 1 - Integrated management of sustainable taxiing operations at the airport. Period 1		
Start Month	1	End Month	18

Objectives

Objectives

The objectives of this work package are:

- Define the operational concept for sustainable taxiing (single-engine, engine-off with towing) and its safety, performance, human-performance and environmental framework.
- Establish baseline requirements (functional, non-functional, interfaces) for the Tug Fleet Manager and the Dynamic Taxi Tool, including integration with A-SMGCS/D-MAN/AOP.
- Develop early prototypes and data adapters for early trials.
- Prepare the Validation Plan (VALP) and execute early/limited HITL activities to tune scope and KPIs for P2.
- Draft initial standardisation inputs

Description

T3.01 Management and Coordination (Lead: NLR): Oversee execution, progress reporting and changes; coordinate contributors and interfaces.

T3.02 Operational Service and Environment Definition (Lead: SNBV | Contributor(s): INDRA, NLR, ADP, CPH, EUROCONTROL, DSN, AIRBUS SAS, AIRBUS OPS, DLR, ENAC): Produce initial OSED to frame Period 1 scope and KPIs. Deliverables: D3.6 and D3.8

T3.03 Development of the technical concept and specifications (Lead: INDRA | Contributor(s): INDRA, NAVIA, NLR): Define baseline functional, non-functional and interface requirements for Tug FM/Dynamic Taxi and their integration with A-SMGCS/D-MAN/AOP. Deliverables: D3.5

T3.04 Prototypes and Tools Development (Lead: INDRA | Contributor(s): INDRA NAVIA, NLR, SNBV, ENAC): Deliver early prototypes (Tug FM, Dynamic Taxi), initial environmental triggers, recommendation logic, and early connectors to D-MAN/A-SMGCS/AOP.

T3.05 Standardisation and Regulation (Lead: DSN | Contributor(s): NLR, ADP, SNBV): Draft initial inputs on regulation & standardisation. Deliverables: D3.1, D3.2, D3.3 and D3.4.

T3.06 Validations: The validation process is structured into several iterative validation exercises in order to ensure a controlled and progressive maturity increase of the solution, while addressing the intrinsic complexity of a modular, service oriented airport platform. This task is composed by the following subtasks:

T3.06.01 Planning (Lead: ENAC | Contributor(s): NLR, ADP, SNBV, CPH, EUROCONTROL, DSN, DLR,): define period 1 objectives, scenarios, data/KPI plan and readiness criteria. Deliverables: D3.7 and D3.9

T3.06.02 Execution (Lead: ENAC | Contributor(s): ADP, DSN, AIRBUS SAS, AIRBUS OPS, DLR): Launch of EXE.SOL01.03 by the end of the period.

T3.06.03 Reporting (Lead: ADP | Contributor(s): EUROCONTROL, DSN, AIRBUS OPS, DLR, ENAC). Consolidate Period 1 findings and lessons learned to refine Period 2 scope (T4.06.03)

Work package WP4 – Solution 1 - Integrated management of sustainable taxiing operations at the airport. Period 2

Work Package Number	WP4	Lead Beneficiary	2 - NLR
Work Package Name	Solution 1 - Integrated management of sustainable taxiing operations at the airport. Period 2		
Start Month	19	End Month	36

Objectives
The objectives of this solution are: • Mature and integrate Tug Fleet Manager and Dynamic Taxi Tool with A-SMGCS/D-MAN/AOP to support single-engine/engine-off taxiing, real-time mode switching using air-quality thresholds, and recommendations where applicable. • Achieve TRL-6 via RTS and live/shadow validations, demonstrating improvements in TTOT/EXOT predictability, taxiway throughput, and ATCO workload reduction • Execute and close validation exercises (RTS and live trial) and consolidate VALR. • Finalise CBA with observed data and deliver standardisation inputs and operational guidance.

Description
T4.01 Management and Coordination (Lead: NLR): It is the continuation of Task 3.01. T4.02 Operational Service and Environment Definition (Lead: SNBV Contributor(s): INDRA, NLR, ADP, CPH, EUROCONTROL, DSN, AIRBUS SAS, AIRBUS OPS, DLR, ENAC): Update OSED to reflect period 2 design/ validation outcomes and readiness for deployment. Deliverables: D4.7 and D4.10 T4.03 - Development of the technical concept and specifications (Lead: INDRA Contributor(s): INDRA NAVIA, NLR, SNBV): Freeze functional, non-functional and interface requirements for Tug FM/Dynamic Taxi and their integration with A-SMGCS/D-MAN/AOP. Deliverables: D4.3, D4.8 and D4.11 T4.04 Prototypes and Tools Development (Lead: INDRA Contributor(s): INDRA NAVIA, NLR, SNBV, EUROCONTROL): Deliver integrated prototypes (Tug FM, Dynamic Taxi), environmental trigger logic, support, connectors to D-MAN/A-SMGCS/AOP and (if applicable) ASR/ASRU pilot support to routing. T4.05 Standardisation and Regulation (Lead: DSN Contributor(s): NLR, ADP, SNBV, EUROCONTROL): continuation of T3.05, liaise with EUROCAE/EASA/ICAO as appropriate. Deliverables: D4.1, D4.2, D4.12 and D4.13 T4.06 Validations: The validation process is structured into several iterative validation exercises in order to ensure a controlled and progressive maturity increase of the solution, while addressing the intrinsic complexity of a modular, service oriented airport platform. This task is composed by the following subtasks: T4.06.01 Validation Plan (Lead: EUROCONTROL Contributor(s): INDRA, NLR, ADP, SNBV, CPH, DSN, DLR): Update VALP, conduct readiness reviews (safety/HP/security), finalise data/KPI collection. Deliverables: D4.6 T4.06.02 Validation Execution (Lead: EUROCONTROL Contributor(s): INDRA, INDRA NAVIA, NLR, ADP, SNBV, DSN, AIRBUS SAS, AIRBUS OPS, DLR): Execute P2 exercises: Continue with EXE.SOL01.02 (Toulouse), EXE.SOL01.03 (Amsterdam), EXE.SOL01.04 (Brétigny), and EXE.SOL01.05 (live/shadow trial at Schiphol). T4.06.03 Validation Report (Lead: ADP Contributor(s): INDRA, INDRA NAVIA, NLR, SNBV, EUROCONTROL, DSN, AIRBUS OPS, DLR, ENAC): Consolidate results, KPI evidence and lessons learned. Deliverables: D4.4 and D4.9 T4.07 Cost Benefit Analysis (Lead: NLR Contributor(s): INDRA, CPH, AIRBUS SAS, AIRBUS OPS): Complete CBA using observed validation data; report stakeholder-specific costs/benefits and environmental effects. Deliverables: D4.5 and D4.14 T4.08 Contextual Note (Lead: NLR). Deliverables: D4.15

Work package WP5 – Solution 2: Cost-effective Aerodrome traffic awareness integrated with AI-Powered NM tools. Period 1

Work Package Number	WP5	Lead Beneficiary	3 - AP-Tech
Work Package Name	Solution 2: Cost-effective Aerodrome traffic awareness integrated with AI-Powered NM tools. Period 1		

Start Month	1	End Month	18
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Objectives
- Establish the baseline operational concept and performance framework (OSD) for SMAS (cooperative surveillance) incl. fallback from A-SMGCS in degraded sensor conditions. - Define technical requirements (TS/IRS) for SMAS core, ADS-B integrity monitoring, GNSS degradation detection, SOA/cloud architecture (incl. centralised multi-airport), NM/ECRA integration, and A-SMGCS “SMAS mode”. - Deliver early prototypes/adapters for: ADS-B-only SMAS baseline; integrity monitoring; initial NM/ECRA interface; SOA/cloud skeleton; A-SMGCS fallback mode. - Plan and execute EXE.SOL02.01,02.02; 02.04, 02.05 - Provide initial inputs to standardisation/regulation on cooperative-only operations, fallback procedures and GNSS interference monitoring.

Description
T5.01 Management and Coordination (Lead: AP-Tech Contributors: AVINOR, GDN, PLW, DSN, PANSA): Oversee execution, progress/change control, consortium comms and reporting; interface with Coordinator/SESAR. T5.02 Development of the operational concept (Lead: AP-Tech Contributor(s): AVINOR, GDN, PLW, EUROCONTROL, DSN, PANSA, ENAIRE, CRIDA, DBL): Produce initial OSD to frame Period 1 scope and KPIs. Deliverables: D5.7 T5.03 Development of the technical concept and specifications (Lead: AP-Tech Contributor(s): INDRA NAVIA, EUROCONTROL, PANSA, ENAIRE). Define baseline functional, performance and interface requirements for SMAS core, integrity/ GNSS monitors, SOA/cloud, NM/ECRA interface and A-SMGCS “SMAS mode”. Deliverables: D5.5 T5.04 Development of tools and prototypes (Lead: AP-Tech Contributor(s): INDRA NAVIA, GDN, PLW, DSN, PANSA, DBL). Deliver first prototypes/adapters: SMAS supported by additional sensors including MLAT, induction loops; SMAS with NM integration tool; Centralized SMAS SOA version; SMAS mode in ASMGCS degraded mode (A-SMGCS can no longer maintain its performance due to the Surface Movement Radar data loss) T5.05 Standardisation and Regulation (Lead: DSN Contributor(s): INDRA NAVIA, AP-Tech, EUROCONTROL, PANSA, ENAIRE): Draft initial inputs on regulation & standardisation. Deliverables: D5.1, D5.2, D5.3 and D5.4 T5.06 Validations. The validation process is structured into several iterative validation exercises in order to ensure a controlled and progressive maturity increase of the solution, while addressing the intrinsic complexity of a modular, service oriented airport platform. This task is divided into the following subtasks: T5.06.01 Planning (Lead: DBL Contributor(s): INDRA NAVIA, AP-Tech, GDN, PLW, EUROCONTROL, DSN, PANSA, CRIDA). Define period 1 objectives/scenarios, sites/data and KPI plan; readiness criteria per exercise. Deliverables: D5.6 T5.06.02 Execution (Lead: AP-Tech Contributor(s): INDRA NAVIA, GDN, PLW, EUROCONTROL, DSN, PANSA, DBL). Execute: EXE.SOL02.01 (GDN: ADS-B+MLAT vs ADS-B+magnetic loop) and EXE.SOL02.02 (WRO: ADS-B SMAS baseline + NM integration), EXE.SOL02.04 (SMAS mode for A-SMGCS with loss of cooperative sensors), EXE.SOL02.05 (centralised multi-airport SMAS). T5.06.03 Reporting (Lead: DBL Contributor(s): EUROCONTROL, DSN). Consolidate Period 1 findings and lessons learned to refine Period 2 scope (T6.06.03)

Work package WP6 – Solution 2: Cost-effective Aerodrome traffic awareness integrated with AI-Powered NM tools. Period 2

Work Package Number	WP6	Lead Beneficiary	3 - AP-Tech
Work Package Name	Solution 2: Cost-effective Aerodrome traffic awareness integrated with AI-Powered NM tools. Period 2		
Start Month	19	End Month	36

Objectives
Mature SMAS to integrated TRL-6 solution incl. centralised SOA/cloud and multi-airport operations; complete GNSS degradation monitoring and ADS-B integrity services.

- Extend to video-enhanced SMAS for non-cooperative detection at selected remote/digital tower sites.
- Freeze OSED and TS/IR; deliver VALR with quantified benefits and operational guidance; provide standardisation inputs.
- Execute EXE.SOL02.03, 02.06 and 02.07; finalise CBA using observed data.

Description

T6.01 Management and Coordination (Lead: AP-Tech | Contributors: AVINOR, GDN, PLW, DSNA, PANSA.) Continuation of T5.01 for period 2.

T6.02 Development of the operational concept (Lead: AP-Tech | Contributor(s): AVINOR, GDN, PLW, EUROCONTROL, DSNA, PANSA, ENAIRE, CRIDA, DBL): Update OSED to reflect period 2 design/validation outcomes and readiness for deployment. Deliverables: D6.3 and D6.8

T6.03 Development of the technical concept and specifications (Lead: AP-Tech | Contributor(s): INDRA NAVIA, EUROCONTROL, PANSA, ENAIRE). Freeze functional/performance/interface requirements for the integrated solution (SMAS core, integrity/GNSS monitors, SOA/cloud centralised ops, NM/ECRA, A-SMGCS mode, video sensors where applicable). D6.4 and D6.9

T6.04 Development of tools and prototypes (Lead: AP-Tech | Contributor(s): INDRA NAVIA, AVINOR, GDN, PLW, PANSA). It concerns the development of prototypes and tools to support the various validation exercises, enabling evaluation of concepts and solutions. Tools include: SMAS supported by video surveillance; SMAS SOA version that is cloud compatible; SMAS with GNSS quality monitoring

T6.05 Standardisation and Regulation (Lead: DSNA | Contributor(s): INDRA NAVIA, AP-Tech, AVINOR, EUROCONTROL, PANSA, ENAIRE): continuation of T5.05, liaise with EUROCAE/EASA/ICAO as appropriate. Deliverables: D6.1, D6.2, D6.10 and D6.11

T6.06 Validations: The validation process is structured into several iterative validation exercises in order to ensure a controlled and progressive maturity increase of the solution, while addressing the intrinsic complexity of a modular, service oriented airport platform

T6.06.01 Planning (Lead: DBL | Contributor(s): INDRA NAVIA, AP-Tech, GDN, PLW, EUROCONTROL, DSNA, PANSA, ENAIRE, CRIDA, DBL). Update plan, readiness reviews (safety/HP/security), final KPI/data capture. Deliverables: D6.6

T6.06.02. Execution (Lead: AP-Tech | Contributor(s): INDRA NAVIA, AVINOR, GND, PLW, EUROCONTROL, DSNA, PANSA, ENAIRE, CRIDA, DBL). Execute: EXE.SOL02.03 (WRO/GDN: SOA-based SMAS cloud + NM tool + GNSS/ADS-B integrity), EXE.SOL02.06 (simulation platform in Madrid with ADS-B integrity monitoring) and EXE.SOL02.07 (AVINOR/remote tower: SMAS enhanced by video sensors).

T6.06.03. Reporting (Lead: DBL | Contributor(s): AP-Tech, AVINOR, GDN, PLW, EUROCONTROL, DSNA, PANSA, ENAIRE, CRIDA). Consolidate results, KPI evidence and lessons learned. Deliverables: D6.7

T6.07 Cost Benefit Analysis (Lead: AP-Tech | Contributor(s): INDRA NAVIA, AVINOR, EUROCONTROL). Complete CBA using observed validation data; report stakeholder-specific costs/benefits and environmental effects. Deliverables: D6.5 and D6.12

T6.08 Contextual Note (Lead: Ap-Tech). Deliverables: D6.13

Work package WP7 – Solution 3: AI automated tracking for digital towers and aerodrome operations. Period 1

Work Package Number	WP7	Lead Beneficiary	1 - INDRA
Work Package Name	Solution 3: AI automated tracking for digital towers and aerodrome operations. Period 1		
Start Month	1	End Month	18

Objectives

- Define the operational concept and performance framework (OSED) for AI-based visual intelligence in digital/remote towers (tracking, ground-label smoothing, video weather) and aerodrome safety alerts.
- Specify baseline technical requirements (TS/IRS) and HMI integration points with DTWR platforms and (where applicable) A-SMGCS, as well as for detection and display of aerodrome safety alerts.
- Deliver first integrated prototype (v1) and lab adapters; align with project-level service delivery & cybersecurity guidance.

- Prepare a first version of VALP and run early lab/HITL activities to tune scope, datasets and KPIs for period 2; initiate site readiness for period 2 exercises.
- Provide initial inputs to standardisation/regulation (EUROCAE WG-100, AI assurance topics).

Description

T7.01 Management and Coordination (Lead: INDRA | Contributors: ENAV, TECHNOSKY, NEXT): Oversee execution, progress/change control, consortium comms and reporting; interface with Coordinator/SESAR.

T7.02 Development of the operational concept (Lead: LFV | Contributor(s): INDRA, MINSAIT, AIA, EUROCONTROL, HUNGAROCONTROL, ENAV, DBL): Produce initial OSED to frame Period 1 scope and KPIs. Deliverables: D7.7

T7.03 Development of the technical concept and specifications (Lead: INDRA | Contributor(s): MINSAIT, AIA, EUROCONTROL, HUNGAROCONTROL, LFV, ENAV, TECHNOSKY, NEXT). Define baseline functional, performance and interface requirements for visual-tracking, ground-label smoothing, video-weather and their integration with DTWR/A-SMGCS and HMI, as well as for aerodrome safety alerting modules. Deliverables: D7.5

T7.04 Development of tools and prototypes (Lead: INDRA | Contributor(s): INDRA NAVIA, MINSAIT, AIA, HUNGAROCONTROL, TECHNOSKY, NEXT, DBL). First integrated prototype of the visual tracking system and aerodrome safety alert detection and display. It covers AI model training, early integration of tracking, smoothing, advanced detection and weather modules, and preparation of a controlled lab environment to verify technical feasibility.

T7.05 Standardisation and Regulation (Lead: EUROCONTROL | Contributor(s): INDRA, MINSAIT, ENAV): Draft initial inputs on regulation & standardisation. Deliverables: D7.1, D7.2, D7.3 and D7.4

T7.06 Validations. The validation process is structured into several iterative validation exercises in order to ensure a controlled and progressive maturity increase of the solution, while addressing the intrinsic complexity of a modular, service oriented airport platform. This task is divided into the following subtasks:

T7.06.01 Planning (Lead: ENAV | Contributor(s): INDRA, MINSAIT, AIA, EUROCONTROL, HUNGAROCONTROL, LFV, DBL). Define objectives/scenarios, sites/data and KPI plan; readiness criteria per exercise. Deliverables: D7.6

T7.06.02 Execution (Lead: DBL | Contributor(s): AIA, EUROCONTROL, TECHNOSKY, NEXT): Run lab/HITL campaigns to verify feasibility and tune models/HMI; launch site-prep for period exercises (T8.06.02)

T7.06.03 Reporting (Lead: DBL | Contributor(s): AIA, EUROCONTROL, HUNGAROCONTROL). Consolidate Period 1 findings and lessons learned to refine Period 2 scope (T8.06.03)

Work package WP8 – Solution 3: AI automated tracking for digital towers and aerodrome operations. Period 2

Work Package Number	WP8	Lead Beneficiary	1 - INDRA
Work Package Name	Solution 3: AI automated tracking for digital towers and aerodrome operations. Period 2		
Start Month	19	End Month	36

Objectives

- Mature and integrate the visual-intelligence modules into operationally relevant DTWR platforms and similarly for aerodrome safety detection; achieve TRL-6 with quantified performance (tracking continuity/accuracy, label stability, weather classification) and HMI/usability outcomes.
- Execute and close the validation campaign (HUNGAROCONTROL SAT; ENAV DTWR enhancements; AIA aerodrome-safety enhancement) and consolidate VALR.
- Freeze OSED v2/PAR and TS/IRS v2; provide standardisation inputs and deployment guidance; complete CBA using observed data.

Description

T8.01 Management and Coordination (Lead: INDRA | Contributors: ENAV, TECHNOSKY, NEXT): Continuation of T7.01 for period 2.

T8.02 Development of the operational concept (Lead: LFV | Contributor(s): INDRA, MINSAIT, AIA,

EUROCONTROL, HUNGAROCONTROL, ENAV, DBL): Update OSED to reflect period 2 design/validation outcomes and readiness for deployment. Deliverables: D8.3 and D8.8

T8.03 Development of the technical concept and specifications (Lead: INDRA | Contributor(s): MINSAIT, AIA, EUROCONTROL, HUNGAROCONTROL, LFV, ENAV, TECHNOSKY, NEXT). Freeze functional/performance/interface requirements for integrated modules, DTWR/A-SMGCS/HMI interfaces, aerodrome safety alerts and logging/traceability for AI assurance. Deliverables: D8.4 and D8.9

T8.04 Development of tools and prototypes (Lead: INDRA | Contributor(s): INDRA NAVIA, MINSAIT, AIA, HUNGAROCONTROL, TECHNOSKY, NEXT). Deliver integrated releases on host DTWR platforms and aerodrome safety detection module: tracking + smoother + weather + safety-alerting; hardened HMI behaviour and data services for assessments.

T8.05 Standardisation and Regulation (Lead: EUROCONTROL | Contributor(s): INDRA, MINSAIT, AIA, LFV, ENAV): continuation of T7.05, liaise with EUROCAE/EASA/ICAO as appropriate. Deliverables: D8.1, D8.2, D8.10 and D8.11.

T8.06 Validations. The validation process is structured into several iterative validation exercises in order to ensure a controlled and progressive maturity increase of the solution, while addressing the intrinsic complexity of a modular, service oriented airport platform. This task is divided into the following subtasks:

T8.06.01 Planning (Lead: ENAV | Contributor(s): INDRA, AIA, EUROCONTROL, HUNGAROCONTROL, LFV, DBL). Update plan, readiness reviews (safety/HP/security), final KPI/data capture. Deliverables: D8.6

T8.06.02 Execution (Lead: INDRA | Contributor(s): INDRA NAVIA, MINSAIT, AIA, EUROCONTROL, HUNGAROCONTROL, ENAV, TECHNOSKY, NEXT, DBL): Execute: EXE.SOL03.01 (SAT (Site Acceptance Test) — HUNGAROCONTROL (Budapest): assess tracking performance, HMI label behaviour and weather classification), EXE.SOL03.02 (Enhancements for DTWR — ENAV (Brindisi/Perugia): VP/HMI & safety-net enhancements; video weather detection), EXE.SOL03.03 (Enhancement of Aerodrome Safety — AIA (Athens): detect/mitigate FOD & wildlife on runway and taxiway incursions; assess safety impact)

T8.06.03 Reporting (Lead: DBL | Contributor(s): INDRA, MINSAIT, AIA, EUROCONTROL, HUNGAROCONTROL, LFV, ENAV, NEXT). Consolidate results, KPI evidence and lessons learned. Deliverables: D8.7

T8.07 - Cost Benefit Analysis (Lead: LFV | Contributor(s): INDRA, MINSAIT, AIA, ENAV). Complete CBA using observed validation data; report stakeholder-specific costs/benefits and environmental effects. Deliverables: D8.5 and D8.12

T8.08 - Contextual Note (Lead: INDRA). Deliverables: D8.13.

Work package WP9 – Solution 4: Advanced AOP & Airport-Network Integration. Period 1

Work Package Number	WP9	Lead Beneficiary	4 - AIA
Work Package Name	Solution 4: Advanced AOP & Airport-Network Integration. Period 1		
Start Month	1	End Month	18

Objectives

- Define the operational concept and performance framework for Advanced AOP with end-to-end DCB across landside/airside and enhanced NOP-AOP exchange (pre-connection checks, post-connection monitoring).
- Specify baseline TS/IRS (functional, non-functional, interfaces) and initial dashboards/HMI hooks; align with project-level service delivery and cybersecurity guidance.
- Deliver initial prototypes and AI models.
- Prepare VALP and launch initial activities of the exercises.
- Start the CBA baseline (methodology, data plan, stakeholder perspectives) and provide initial inputs to standardisation/regulation (SWIM/AOP–NOP/DCB data quality).

Description

T9.01 Management and Coordination (Lead: AIA): Oversee execution, progress/change control, consortium comms and reporting; interface with Coordinator/SESAR.

T9.02 Development of the operational concept (Lead: AIA | Contributor(s): INDRA, AP-Tech, ADP, SNBV, GOLDAIR, EUROCONTROL, PILDO, DLR): Produce initial OSED to frame Period 1 scope and KPIs. Deliverables: D9.6

T9.03 Development of the technical concept and specifications (Lead: INDRA | Contributor(s): AP-Tech, AIA,

EUROCONTROL, PILDO): Define baseline requirements for Advanced AOP platform core/services, NOP-AOP exchange, predictors, QUANT, NM connectors and data models/APIs. Deliverables: D9.5

T9.04 Development of tools and prototypes (Lead: INDRA | Contributor(s): AP-Tech, AIA, GOLDAIR, EUROCONTROL, PILDO): Deliver preliminary prototypes of Advanced AOP components (Flight/PAX/BAG predictors, QUANT, NM HyperVision connectors, Centralized Data Hub adapters) and initial APOC dashboards.

T9.05 Standardisation and Regulation framework (Lead: EUROCONTROL | Contributor(s): AIA): Draft initial inputs on regulation & standardisation. Deliverables: D9.1, D9.2, D9.3 and D9.4.

T9.06 Validations. The validation process is structured into several iterative validation exercises in order to ensure a controlled and progressive maturity increase of the solution, while addressing the intrinsic complexity of a modular, service oriented airport platform. This task is divided into the following subtasks:

T9.06.01 Planning (Lead: DLR | Contributor(s): INDRA, AP-Tech, AIA, ADP, SNBV, GOLDAIR, EUROCONTROL, PILDO). Define objectives/scenarios, sites/data and KPI plan; readiness criteria per exercise. Deliverables: D9.7

T9.06.02 Execution (Lead: AIA | Contributor(s): ADP, GOLDAIR, EUROCONTROL, PILDO): Lab pilots/site onboarding/dry-runs for EXE.SOL04.01–04.02; integrate data feeds (AODB-ACDM/NMB2B/ECRA) and prepare HITL for Period 2.

T9.06.03 Reporting (Lead: EUROCONTROL | Contributor(s): AIA, ADP, GOLDAIR, PILDO): Consolidate Period 1 findings and lessons learned to refine Period 2 scope (T10.06.03).

T9.07 Cost Benefit Analysis Baseline (Lead: AIA | Contributor(s): PILDO). CBA baseline (method, assumptions, data plan); prepare templates and initial datasets; coordinate with validations to feed Period 2 completion (T10.07).

Work package WP10 – Solution 4: Advanced AOP & Airport-Network Integration. Period 2

Work Package Number	WP10	Lead Beneficiary	4 - AIA
Work Package Name	Solution 4: Advanced AOP & Airport-Network Integration. Period 2		
Start Month	19	End Month	36

Objectives

- Finalise Advanced AOP integration (AOP–NOP exchange via NMVP/ECRA, data predictors from network services to airport systems, QUANT, dashboards) and achieve TRL-6 through validation in operationally relevant environments.
- Execute and complete EXE.SOL04.01–04.02; deliver VALR with quantified improvements in predictability/DCB and AOP-NOP data-quality compliance.
- Freeze TS/IRS, issue operational guidance/standardisation inputs, and finalise CBA with observed data.

Description

T10.01 Management and Coordination (Lead: AIA): Continuation of T9.01 for period 2.

T10.02 Development of the operational concept (Lead: AIA | Contributor(s): INDRA, AP-Tech, ADP, SNBV, GOLDAIR, EUROCONTROL, PILDO, DLR): Update OSED to reflect period 2 design/validation outcomes and readiness for deployment. Deliverables: D10.3 and D10.8

T10.03 Development of the technical concept and specifications (Lead: INDRA | Contributor(s): AP-Tech, AIA, EUROCONTROL, PILDO): Freeze functional/performance/interface specs for Advanced AOP services, NOP-AOP data exchange, predictors, QUANT and dashboards. Deliverables: D10.4 and D10.9

T10.04 Development of tools and prototypes (Lead: INDRA | Contributor(s): AP-Tech, AIA, EUROCONTROL, PILDO): Deliver integrated releases on host environments (AIA/EUROCONTROL): Advanced AOP + Flight/PAX/BAG predictors, QUANT, NM HyperVision connectors, Centralized Data Hub flows, APOC dashboards and human-in-the-loop (HITL) tools.

T10.05 Standardisation and Regulation (Lead: EUROCONTROL | Contributor(s): AIA): continuation of T9.05, liaise with EUROCAE/EASA/ICAO as appropriate. Deliverables: D10.1, D10.2, D10.10 and D10.11

T10.06 Validations. The validation process is structured into several iterative validation exercises in order to ensure a controlled and progressive maturity increase of the solution, while addressing the intrinsic complexity of a modular, service oriented airport platform. This task is divided into the following subtasks:

T10.06.01 Planning (Lead: DLR | Contributor(s): INDRA, AP-Tech, AIA, ADP, SNBV, GOLDAIR, EUROCONTROL, PILDO). Update plan, readiness reviews (safety/HP/security), final KPI/data capture. Deliverables: D10.6

T10.06.02 Execution (Lead: AIA | Contributor(s): INDRA, AP-Tech, ADP, SNBV, GOLDAIR, EUROCONTROL, PILDO, DLR): Execute and complete: EXE.SOL04.01 DCB @ AIA (Athens) — end-to-end

landside/airside DCB with APOC/HITL; EXE.SOL04.02 NOP (NMVP) - AOP — pre-/post-connection processes; predictability & QA envelopes; Centralized Data Hub (ECRA) — AODB → NM Central Repository → NMB2B → ECRA/HMI; ops benefits & cost reduction.

T10.06.03 Reporting (Lead: DLR | Contributor(s): INDRA, AP-Tech, AIA, ADP, GOLDAIR, EUROCONTROL, PILDO): Consolidate results, KPI evidence and lessons learned. Deliverables: D10.7

T10.07 - Cost Benefit Analysis (Lead: AIA | Contributor(s): INDRA, GOLDAIR, PILDO): Complete CBA using observed validation data; report stakeholder-specific costs/benefits and environmental effects. Deliverables: D10.5 and D10.12.

T10.08 - Contextual Note (Lead: AIA). Deliverables: D10.13

Work package WP11 – Communication, Dissemination and Exploitation. Period 1

Work Package Number	WP11	Lead Beneficiary	1 - INDRA
Work Package Name	Communication, Dissemination and Exploitation. Period 1		
Start Month	1	End Month	18

Objectives

- Launch project visibility aligned with SESAR 3 JU; clear messages, audiences and KPIs.
- Build early stakeholder engagement to support acceptance, feedback and alignment with ops needs.
- Lay the groundwork for exploitation (IP/access framework and KER tracking).

Description

T11.01 CDE Plan preparation and update: Draft the Communication, Dissemination & Exploitation Plan (messages, audiences, channels, KPIs, roles); align with SESAR 3 JU; set update cycle. Deliverables: D11.1 and D11.2

T11.02 Communication and Branding: Visual identity; SESAR project page; starter assets (press/social/media kit/intro video); content calendar in sync with JU. (See Table 7)

T11.03 Dissemination Preparation: Stakeholder mapping; event & publication pipeline; abstracts to key venues; editorial calendar and contact lists. (See Table 7)

T11.04 Exploitation Planning (Initial Phase): Identify initial key exploitation results; common IP/access-rights framework (with WP1); initialise exploitation strategy for period 2 consolidation.

Work package WP12 – Communication, Dissemination and Exploitation. Period 2

Work Package Number	WP12	Lead Beneficiary	1 - INDRA
Work Package Name	Communication, Dissemination and Exploitation. Period 2		
Start Month	19	End Month	36

Objectives

- Disseminate validated TRL-6 results through high-impact channels; show measurable performance and operational relevance.
- Maximise uptake via targeted stakeholder actions (Open/Demo Days, major events).
- Deliver the final CDE Plan incl. exploitation roadmap for post-project uptake.

Description

T12.01 CDE Plan updates and final version: Mid-term update (≈M20) with KPIs/metrics; final consolidated CDE Plan (≈M32) incl. post-project roadmap. Deliverables: D12.1 and D12.2

T12.02 Dissemination Activities: Open/Demo Days (≥1/solution); presence at SESAR Innovation Days, Airspace World, etc.; technical/operational papers (See Table 7)

T12.03 Communication Activities: Continuous web/social/newsletters; coordinated press; final public video and results brief per JU guidelines. (See Table 7)

T12.04 Exploitation Consolidation: Complete the post Exploitation strategy & plan; key exploitable list with ownership and uptake paths (commercial/institutional/standardisation); integrate into final CDE Plan.

STAFF EFFORT

Staff effort per participant <i>Grant Preparation (Work packages - Effort screen) — Enter the info.</i>											
Participant	WP1	WP2	WP3	WP4	WP5	WP6	WP7	WP8	WP9	WP10	Total Person-Months
1 - INDRA	22.00	23.00	45.00	58.00			50.00	76.00	70.00	80.00	434.10
1.1 - INDRA NAVIA			7.00	36.00	20.00	41.00	1.00	5.00			110.00
1.2 - MINSAIT	4.60						25.00	34.00			63.60
2 - NLR	1.49	1.51	15.40	25.60							44.00
3 - AP-Tech	1.50	1.50			75.00	57.00			23.00	23.00	186.00
4 - AIA	1.50	1.50					14.00	16.00	24.00	26.00	88.00
5 - ADP			11.00	11.50					7.50	6.50	37.50
6 - SNBV			17.50	18.00					6.00	5.00	46.80
7 - AVINOR					3.20	11.80					15.00
8 - CPH			3.50	3.50							7.00
9 - GDN					7.00	9.00					16.50
10 - PLW					7.00	9.00					16.55
11 - GOLDAIR									14.00	14.00	30.00
12 - EUROCONTROL			17.00	40.00	20.00	23.00	6.00	6.00	33.00	33.00	182.00
13 - HUNGAROCONTROL							4.25	5.50			10.00
14 - DSNA			8.10	11.90	14.75	7.25					42.60
15 - LFV							17.00	18.00			35.00
16 - PANSA					10.00	12.00					22.00
17 - AIRBUS SAS			1.50	2.00							3.50

Staff effort per participant											
Grant Preparation (Work packages - Effort screen) — Enter the info.											
Participant	WP1	WP2	WP3	WP4	WP5	WP6	WP7	WP8	WP9	WP10	Total Person-Months
18 - AIRBUS OPS			3.00	2.50							5.50
19 - ENAV							10.00	16.00			28.00
19.1 - TECHNO SKY							16.50	14.50			31.00
20 - ENAIRE					1.20	5.80					7.00
20.1 - CRIDA					7.00	6.50					13.50
21 - PILDO									10.00	10.00	22.00
22 - NEXT							17.25	17.25			34.50
23 - DLR			11.00	10.00					14.00	23.00	64.00
24 - ENAC			28.00	8.00							36.00
25 - DBL					13.50	15.00	16.50	20.50			65.50
Total Person-Months	31.09	27.51	168.00	227.00	178.65	197.35	177.50	228.75	201.50	220.50	1697.15

Staff effort per participant			
Grant Preparation (Work packages - Effort screen) — Enter the info.			
Participant	WP11	WP12	Total Person-Months
1 - INDRA	3.50	6.60	434.10
1.1 - INDRA NAVIA			110.00
1.2 - MINSAIT			63.60
2 - NLR			44.00
3 - AP-Tech	2.50	2.50	186.00
4 - AIA	2.00	3.00	88.00

Staff effort per participant <i>Grant Preparation (Work packages - Effort screen) — Enter the info.</i>			
Participant	WP11	WP12	Total Person-Months
5 - ADP	0.25	0.75	37.50
6 - SNBV		0.30	46.80
7 - AVINOR			15.00
8 - CPH			7.00
9 - GDN	0.25	0.25	16.50
10 - PLW	0.30	0.25	16.55
11 - GOLDAIR	1.00	1.00	30.00
12 - EUROCONTROL	1.00	3.00	182.00
13 - HUNGAROCONTROL		0.25	10.00
14 - DSNA	0.20	0.40	42.60
15 - LFV			35.00
16 - PANSА			22.00
17 - AIRBUS SAS			3.50
18 - AIRBUS OPS			5.50
19 - ENAV	1.00	1.00	28.00
19.1 - TECHNO SKY			31.00
20 - ENAIRE			7.00
20.1 - CRIDA			13.50
21 - PILDO	1.00	1.00	22.00
22 - NEXT			34.50
23 - DLR	3.00	3.00	64.00

Staff effort per participant			
Grant Preparation (Work packages - Effort screen) — Enter the info.			
Participant	WP11	WP12	Total Person-Months
24 - ENAC			36.00
25 - DBL			65.50
Total Person-Months	16.00	23.30	1697.15

LIST OF DELIVERABLES

Deliverables <i>Grant Preparation (Deliverables screen) — Enter the info.</i> <i>The labels used mean:</i> <i>Public — fully open (🚩 automatically posted online)</i> <i>Sensitive — limited under the conditions of the Grant Agreement</i> <i>EU classified — RESTREINT-UE/EU-RESTRICTED, CONFIDENTIEL-UE/EU-CONFIDENTIAL, SECRET-UE/EU-SECRET under Decision 2015/444</i>						
Deliverable No	Deliverable Name	Work Package No	Lead Beneficiary	Type	Dissemination Level	Due Date (month)
D1.1	Project Management Plan (PMP)	WP1	1 - INDRA	R — Document, report	SEN - Sensitive	3
D1.2	Data Management Plan (DMP)	WP1	1 - INDRA	DMP — Data Management Plan	PU - Public	6
D1.3	PMP v2	WP1	1 - INDRA	R — Document, report	PU - Public	8
D1.4	DMP v2	WP1	1 - INDRA	DMP — Data Management Plan	PU - Public	18
D2.1	DMP v3	WP2	1 - INDRA	DMP — Data Management Plan	PU - Public	32
D3.1	STAND v1.0 (Sol1)	WP3	14 - DSNA	R — Document, report	SEN - Sensitive	3
D3.2	REG v1.0 (Sol1)	WP3	14 - DSNA	R — Document, report	SEN - Sensitive	3
D3.3	STAND v2.0 (Sol1)	WP3	14 - DSNA	R — Document, report	SEN - Sensitive	8
D3.4	REG v2.0 (Sol1)	WP3	14 - DSNA	R — Document, report	SEN - Sensitive	8
D3.5	TS/IRS v1.0 (Sol1)	WP3	1 - INDRA	R — Document, report	SEN - Sensitive	8
D3.6	TRL4 OSED v1.0 (Sol1)	WP3	6 - SNBV	R — Document, report	SEN - Sensitive	8
D3.7	TRL4 VALP v1.0 (Sol1)	WP3	24 - ENAC	R — Document, report	SEN - Sensitive	8
D3.8	TRL4 OSED v2.0 (Sol1)	WP3	6 - SNBV	R — Document, report	SEN - Sensitive	16

Deliverables

Grant Preparation (Deliverables screen) — Enter the info.

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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)
D3.9	TRL4 VALP v2.0 (Sol1)	WP3	12 - EUROCONTROL	R — Document, report	SEN - Sensitive	16
D3.10	TS/IRS v.2.0 (Sol 1)	WP3	1 - INDRA	R — Document, report	SEN - Sensitive	16
D4.1	STAND v3.0 (Sol1)	WP4	14 - DSNA	R — Document, report	SEN - Sensitive	21
D4.2	REG v3.0 (Sol1)	WP4	14 - DSNA	R — Document, report	SEN - Sensitive	21
D4.3	OSD v3.0 (Sol1)	WP4	6 - SNBV	R — Document, report	SEN - Sensitive	21
D4.4	VALR v1.0 (Sol1)	WP4	5 - ADP	R — Document, report	SEN - Sensitive	21
D4.5	CBA v1.0 (Sol1)	WP4	2 - NLR	R — Document, report	SEN - Sensitive	21
D4.6	TRL6 VALP (Sol1)	WP4	12 - EUROCONTROL	R — Document, report	SEN - Sensitive	24
D4.7	OSD v4.0 (Sol1)	WP4	6 - SNBV	R — Document, report	SEN - Sensitive	24
D4.8	TS/IRS v3.0 (Sol1)	WP4	1 - INDRA	R — Document, report	SEN - Sensitive	24
D4.9	VALR v2.0 (Sol1)	WP4	5 - ADP	R — Document, report	PU - Public	31
D4.10	TRL6 OSD v4.0 (Sol1)	WP4	6 - SNBV	R — Document, report	PU - Public	32
D4.11	TS/IRS v4.0 (Sol1)	WP4	1 - INDRA	R — Document, report	PU - Public	32
D4.12	STAND v4.0 (Sol1)	WP4	14 - DSNA	R — Document, report	PU - Public	32
D4.13	REG v4.0 (Sol1)	WP4	14 - DSNA	R — Document, report	PU - Public	32
D4.14	CBA v2.0 (Sol1)	WP4	2 - NLR	R — Document, report	PU - Public	32
D4.15	CN (Sol1)	WP4	2 - NLR	R — Document, report	PU - Public	32

Deliverables

Grant Preparation (Deliverables screen) — Enter the info.

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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)
D5.1	STAND v1.0 (Sol2)	WP5	14 - DSNA	R — Document, report	SEN - Sensitive	3
D5.2	REG v1.0 (Sol2)	WP5	14 - DSNA	R — Document, report	SEN - Sensitive	3
D5.3	STAND v2.0 (Sol2)	WP5	14 - DSNA	R — Document, report	SEN - Sensitive	8
D5.4	REG v2.0 (Sol2)	WP5	14 - DSNA	R — Document, report	SEN - Sensitive	8
D5.5	TS/IRS v1.0 (Sol2)	WP5	3 - AP-Tech	R — Document, report	SEN - Sensitive	8
D5.6	VALP v1.0 (Sol2)	WP5	25 - DBL	R — Document, report	SEN - Sensitive	8
D5.7	OSD v1.0 (Sol2)	WP5	3 - AP-Tech	R — Document, report	SEN - Sensitive	8
D5.8	OSD v2.0 (Sol2)	WP5	3 - AP-Tech	R — Document, report	SEN - Sensitive	16
D5.9	TS/IRS v2.0 (Sol2)	WP5	3 - AP-Tech	R — Document, report	SEN - Sensitive	16
D5.10	VALP v2.0 (Sol2)	WP5	25 - DBL	R — Document, report	SEN - Sensitive	16
D6.1	STAND v3.0 (Sol2)	WP6	14 - DSNA	R — Document, report	SEN - Sensitive	21
D6.2	REG v3.0 (Sol2)	WP6	14 - DSNA	R — Document, report	SEN - Sensitive	21
D6.3	OSD v3.0 (Sol2)	WP6	3 - AP-Tech	R — Document, report	SEN - Sensitive	21
D6.4	TS/IRS v3.0 (Sol2)	WP6	3 - AP-Tech	R — Document, report	SEN - Sensitive	21
D6.5	CBA v1.0 (Sol2)	WP6	3 - AP-Tech	R — Document, report	SEN - Sensitive	21
D6.6	VALP v3.0 (Sol2)	WP6	25 - DBL	R — Document, report	SEN - Sensitive	23
D6.7	VALR (Sol2)	WP6	25 - DBL	R — Document, report	PU - Public	31

Deliverables

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Deliverable No	Deliverable Name	Work Package No	Lead Beneficiary	Type	Dissemination Level	Due Date (month)
D6.8	OSD v4.0 (Sol2)	WP6	3 - AP-Tech	R — Document, report	PU - Public	32
D6.9	TS/IRS v4.0 (Sol2)	WP6	3 - AP-Tech	R — Document, report	PU - Public	32
D6.10	STAND v4.0 (Sol2)	WP6	14 - DSNA	R — Document, report	PU - Public	32
D6.11	REG v4.0 (Sol2)	WP6	14 - DSNA	R — Document, report	PU - Public	32
D6.12	CBA v2.0 (Sol2)	WP6	3 - AP-Tech	R — Document, report	PU - Public	32
D6.13	CN (Sol2)	WP6	3 - AP-Tech	R — Document, report	PU - Public	32
D7.1	STAND v1.0 (Sol3)	WP7	12 - EUROCONTROL	R — Document, report	SEN - Sensitive	3
D7.2	REG v1.0 (Sol3)	WP7	12 - EUROCONTROL	R — Document, report	SEN - Sensitive	3
D7.3	STAND v2.0 (Sol3)	WP7	12 - EUROCONTROL	R — Document, report	SEN - Sensitive	8
D7.4	REG v2.0 (Sol3)	WP7	12 - EUROCONTROL	R — Document, report	SEN - Sensitive	8
D7.5	TS/IRS v1.0 (Sol3)	WP7	1 - INDRA	R — Document, report	SEN - Sensitive	8
D7.6	VALP v1.0 (Sol3)	WP7	19 - ENAV	R — Document, report	SEN - Sensitive	8
D7.7	OSD v1.0 (Sol3)	WP7	15 - LFV	R — Document, report	SEN - Sensitive	8
D8.1	STAND v3.0 (Sol3)	WP8	12 - EUROCONTROL	R — Document, report	SEN - Sensitive	21
D8.2	REG v3.0 (Sol3)	WP8	12 - EUROCONTROL	R — Document, report	SEN - Sensitive	21
D8.3	OSD v2.0 (Sol3)	WP8	15 - LFV	R — Document, report	SEN - Sensitive	21
D8.4	TS/IRS v2.0 (Sol3)	WP8	1 - INDRA	R — Document, report	SEN - Sensitive	21

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Deliverable No	Deliverable Name	Work Package No	Lead Beneficiary	Type	Dissemination Level	Due Date (month)
D8.5	CBA v1.0 (Sol3)	WP8	15 - LFV	R — Document, report	SEN - Sensitive	21
D8.6	VALP v2.0 (Sol3)	WP8	19 - ENAV	R — Document, report	SEN - Sensitive	22
D8.7	VALR (Sol3)	WP8	25 - DBL	R — Document, report	PU - Public	31
D8.8	OSD v3.0 (Sol3)	WP8	15 - LFV	R — Document, report	PU - Public	32
D8.9	TS/IRS v3.0 (Sol3)	WP8	1 - INDRA	R — Document, report	PU - Public	32
D8.10	STAND v4.0 (Sol3)	WP8	12 - EUROCONTROL	R — Document, report	PU - Public	32
D8.11	REG v4.0 (Sol3)	WP8	12 - EUROCONTROL	R — Document, report	PU - Public	32
D8.12	CBA v2.0 (Sol3)	WP8	15 - LFV	R — Document, report	PU - Public	32
D8.13	CN (Sol3)	WP8	1 - INDRA	R — Document, report	PU - Public	32
D9.1	STAND v1.0 (Sol4)	WP9	12 - EUROCONTROL	R — Document, report	SEN - Sensitive	3
D9.2	REG v1.0 (Sol4)	WP9	4 - AIA	R — Document, report	SEN - Sensitive	3
D9.3	STAND v2.0 (Sol4)	WP9	12 - EUROCONTROL	R — Document, report	SEN - Sensitive	8
D9.4	REG v2.0 (Sol4)	WP9	4 - AIA	R — Document, report	SEN - Sensitive	8
D9.5	TS/IRS v1.0 (Sol4)	WP9	1 - INDRA	R — Document, report	SEN - Sensitive	8
D9.6	OSD v1.0 (Sol4)	WP9	4 - AIA	R — Document, report	SEN - Sensitive	8
D9.7	VALP v1.0 (Sol4)	WP9	23 - DLR	R — Document, report	SEN - Sensitive	8
D10.1	STAND v3.0 (Sol4)	WP10	12 - EUROCONTROL	R — Document, report	SEN - Sensitive	21

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Deliverable No	Deliverable Name	Work Package No	Lead Beneficiary	Type	Dissemination Level	Due Date (month)
D10.2	REG v3.0 (Sol4)	WP10	4 - AIA	R — Document, report	SEN - Sensitive	21
D10.3	OSD v2.0 (Sol4)	WP10	4 - AIA	R — Document, report	SEN - Sensitive	21
D10.4	TS/IRS v2.0 (Sol4)	WP10	1 - INDRA	R — Document, report	SEN - Sensitive	21
D10.5	CBA v1.0 (Sol4)	WP10	4 - AIA	R — Document, report	SEN - Sensitive	21
D10.6	VALP v2.0 (Sol4)	WP10	23 - DLR	R — Document, report	SEN - Sensitive	23
D10.7	VALR (Sol4)	WP10	23 - DLR	R — Document, report	PU - Public	31
D10.8	OSD v3.0 (Sol4)	WP10	4 - AIA	R — Document, report	PU - Public	32
D10.9	TS/IRS v3.0 (Sol4)	WP10	1 - INDRA	R — Document, report	PU - Public	32
D10.10	STAND v4.0 (Sol4)	WP10	12 - EUROCONTROL	R — Document, report	PU - Public	32
D10.11	REG v4.0 (Sol4)	WP10	4 - AIA	R — Document, report	PU - Public	32
D10.12	CBA v2.0 (Sol4)	WP10	4 - AIA	R — Document, report	PU - Public	32
D10.13	CN (Sol4)	WP10	4 - AIA	R — Document, report	PU - Public	32
D11.1	CDE Plan v1.0	WP11	1 - INDRA	DEC — Websites, patent filings, videos, etc	PU - Public	3
D11.2	CDE Plan v2.0	WP11	1 - INDRA	DEC — Websites, patent filings, videos, etc	PU - Public	8
D12.1	CDE Plan 3.0	WP12	1 - INDRA	DEC — Websites, patent filings, videos, etc	PU - Public	21

Deliverables

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Deliverable No	Deliverable Name	Work Package No	Lead Beneficiary	Type	Dissemination Level	Due Date (month)
D12.2	CDE Plan v4.0	WP12	1 - INDRA	DEC — Websites, patent filings, videos, etc	PU - Public	34

Deliverable D1.1 – Project Management Plan (PMP)

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

Description
Initial project management plan including internal structure and reporting procedures.

Deliverable D1.2 – Data Management Plan (DMP)

Deliverable Number	D1.2	Lead Beneficiary	1 - INDRA
Deliverable Name	Data Management Plan (DMP)		
Type	DMP — Data Management Plan	Dissemination Level	PU - Public
Due Date (month)	6	Work Package No	WP1

Description
Initial data management plan covering FAIR principles and consortium-wide practices.

Deliverable D1.3 – PMP v2

Deliverable Number	D1.3	Lead Beneficiary	1 - INDRA
Deliverable Name	PMP v2		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	8	Work Package No	WP1

Description
Updated PMP aligned to Review 1.

Deliverable D1.4 – DMP v2

Deliverable Number	D1.4	Lead Beneficiary	1 - INDRA
Deliverable Name	DMP v2		
Type	DMP — Data Management Plan	Dissemination Level	PU - Public
Due Date (month)	18	Work Package No	WP1

Description
Updated DMP reflecting Period 1 progress.

Deliverable D2.1 – DMP v3

Deliverable Number	D2.1	Lead Beneficiary	1 - INDRA
Deliverable Name	DMP v3		
Type	DMP — Data Management Plan	Dissemination Level	PU - Public
Due Date (month)	32	Work Package No	WP2

Description
Final DMP incl. archiving & post-project data governance.

Deliverable D3.1 – STAND v1.0 (Sol1)

Deliverable Number	D3.1	Lead Beneficiary	14 - DSNA
Deliverable Name	STAND v1.0 (Sol1)		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	3	Work Package No	WP3

Description
Initial standardisation inputs for Sol1.

Deliverable D3.2 – REG v1.0 (Sol1)

Deliverable Number	D3.2	Lead Beneficiary	14 - DSNA
Deliverable Name	REG v1.0 (Sol1)		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	3	Work Package No	WP3

Description
Initial regulatory/approval considerations for Sol1.

Deliverable D3.3 – STAND v2.0 (Sol1)

Deliverable Number	D3.3	Lead Beneficiary	14 - DSNA
Deliverable Name	STAND v2.0 (Sol1)		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	8	Work Package No	WP3

Description
Updated standardisation inputs for Sol1.

Deliverable D3.4 – REG v2.0 (Sol1)

Deliverable Number	D3.4	Lead Beneficiary	14 - DSNB
Deliverable Name	REG v2.0 (Sol1)		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	8	Work Package No	WP3

Description
Updated regulatory inputs for Sol1.

Deliverable D3.5 – TS/IRS v1.0 (Sol1)

Deliverable Number	D3.5	Lead Beneficiary	1 - INDRA
Deliverable Name	TS/IRS v1.0 (Sol1)		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	8	Work Package No	WP3

Description
Initial technical & Interface Specs for Sol1 baseline.

Deliverable D3.6 – TRL4 OSED v1.0 (Sol1)

Deliverable Number	D3.6	Lead Beneficiary	6 - SNBV
Deliverable Name	TRL4 OSED v1.0 (Sol1)		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	8	Work Package No	WP3

Description
Initial Operational Service & Environment Definition for Sol1 TRL4

Deliverable D3.7 – TRL4 VALP v1.0 (Sol1)

Deliverable Number	D3.7	Lead Beneficiary	24 - ENAC
Deliverable Name	TRL4 VALP v1.0 (Sol1)		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	8	Work Package No	WP3

Description
Initial Validation Plan for Sol1 TRL4

Deliverable D3.8 – TRL4 OSED v2.0 (Sol1)

Deliverable Number	D3.8	Lead Beneficiary	6 - SNBV
Deliverable Name	TRL4 OSED v2.0 (Sol1)		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	16	Work Package No	WP3

Description
Intermediate Operational Service & Environment Definition for Sol1 TRL4

Deliverable D3.9 – TRL4 VALP v2.0 (Sol1)

Deliverable Number	D3.9	Lead Beneficiary	12 - EUROCONTROL
Deliverable Name	TRL4 VALP v2.0 (Sol1)		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	16	Work Package No	WP3

Description
Validation Plan for Sol1 TRL4

Deliverable D3.10 – TS/IRS v.2.0 (Sol 1)

Deliverable Number	D3.10	Lead Beneficiary	1 - INDRA
Deliverable Name	TS/IRS v.2.0 (Sol 1)		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	16	Work Package No	WP3

Description
Technical & Interface Specs for Sol1 baseline.

Deliverable D4.1 – STAND v3.0 (Sol1)

Deliverable Number	D4.1	Lead Beneficiary	14 - DSNA
Deliverable Name	STAND v3.0 (Sol1)		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	21	Work Package No	WP4

Description
Standardisation pack for Sol1.

Deliverable D4.2 – REG v3.0 (Sol1)

Deliverable Number	D4.2	Lead Beneficiary	14 - DSNA
Deliverable Name	REG v3.0 (Sol1)		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	21	Work Package No	WP4

Description
Regulatory pack for Sol1.

Deliverable D4.3 – OSED v3.0 (Sol1)

Deliverable Number	D4.3	Lead Beneficiary	6 - SNBV
Deliverable Name	OSED v3.0 (Sol1)		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	21	Work Package No	WP4

Description
Intermediate Operational Service & Environment Definition for Sol1 TRL6

Deliverable D4.4 – VALR v1.0 (Sol1)

Deliverable Number	D4.4	Lead Beneficiary	5 - ADP
Deliverable Name	VALR v1.0 (Sol1)		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	21	Work Package No	WP4

Description
Initial Validation Report for Sol 1

Deliverable D4.5 – CBA v1.0 (Sol1)

Deliverable Number	D4.5	Lead Beneficiary	2 - NLR
Deliverable Name	CBA v1.0 (Sol1)		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	21	Work Package No	WP4

Description
Initial Cost-Benefit Analysis Sol1

Deliverable D4.6 – TRL6 VALP (Sol1)

Deliverable Number	D4.6	Lead Beneficiary	12 - EUROCONTROL
Deliverable Name	TRL6 VALP (Sol1)		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	24	Work Package No	WP4

Description
Validation Plan for Sol1 TRL6

Deliverable D4.7 – OSED v4.0 (Sol1)

Deliverable Number	D4.7	Lead Beneficiary	6 - SNBV
Deliverable Name	OSED v4.0 (Sol1)		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	24	Work Package No	WP4

Description
Intermediate Operational Service & Environment Definition for Sol1

Deliverable D4.8 – TS/IRS v3.0 (Sol1)

Deliverable Number	D4.8	Lead Beneficiary	1 - INDRA
Deliverable Name	TS/IRS v3.0 (Sol1)		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	24	Work Package No	WP4

Description
Technical & Interface Specs for Sol1.

Deliverable D4.9 – VALR v2.0 (Sol1)

Deliverable Number	D4.9	Lead Beneficiary	5 - ADP
Deliverable Name	VALR v2.0 (Sol1)		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	31	Work Package No	WP4

Description
Validation Report for Sol1

Deliverable D4.10 – TRL6 OSED v4.0 (Sol1)

Deliverable Number	D4.10	Lead Beneficiary	6 - SNBV
Deliverable Name	TRL6 OSED v4.0 (Sol1)		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	32	Work Package No	WP4

Description
Final Operational Service & Environment Definition for Sol1 TRL6

Deliverable D4.11 – TS/IRS v4.0 (Sol1)

Deliverable Number	D4.11	Lead Beneficiary	1 - INDRA
Deliverable Name	TS/IRS v4.0 (Sol1)		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	32	Work Package No	WP4

Description
Technical & Interface Specs for Sol1.

Deliverable D4.12 – STAND v4.0 (Sol1)

Deliverable Number	D4.12	Lead Beneficiary	14 - DSNA
Deliverable Name	STAND v4.0 (Sol1)		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	32	Work Package No	WP4

Description
Final Standardisation pack for Sol1.

Deliverable D4.13 – REG v4.0 (Sol1)

Deliverable Number	D4.13	Lead Beneficiary	14 - DSNA
Deliverable Name	REG v4.0 (Sol1)		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	32	Work Package No	WP4

Description
Final Regulatory pack for Sol1.

Deliverable D4.14 – CBA v2.0 (Sol1)

Deliverable Number	D4.14	Lead Beneficiary	2 - NLR
Deliverable Name	CBA v2.0 (Sol1)		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	32	Work Package No	WP4

Description
Cost-Benefit Analysis Sol1

Deliverable D4.15 – CN (Sol1)

Deliverable Number	D4.15	Lead Beneficiary	2 - NLR
Deliverable Name	CN (Sol1)		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	32	Work Package No	WP4

Description
Contextual Note for Sol1

Deliverable D5.1 – STAND v1.0 (Sol2)

Deliverable Number	D5.1	Lead Beneficiary	14 - DSNA
Deliverable Name	STAND v1.0 (Sol2)		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	3	Work Package No	WP5

Description
Initial standardisation inputs for Sol2.

Deliverable D5.2 – REG v1.0 (Sol2)

Deliverable Number	D5.2	Lead Beneficiary	14 - DSNA
Deliverable Name	REG v1.0 (Sol2)		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	3	Work Package No	WP5

Description
Initial regulatory/approval considerations for Sol2.

Deliverable D5.3 – STAND v2.0 (Sol2)

Deliverable Number	D5.3	Lead Beneficiary	14 - DSNA
Deliverable Name	STAND v2.0 (Sol2)		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	8	Work Package No	WP5

Description
Initial standardisation inputs for Sol2.

Deliverable D5.4 – REG v2.0 (Sol2)

Deliverable Number	D5.4	Lead Beneficiary	14 - DSNA
Deliverable Name	REG v2.0 (Sol2)		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	8	Work Package No	WP5

Description
Updated regulatory inputs for Sol2.

Deliverable D5.5 – TS/IRS v1.0 (Sol2)

Deliverable Number	D5.5	Lead Beneficiary	3 - AP-Tech
Deliverable Name	TS/IRS v1.0 (Sol2)		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	8	Work Package No	WP5

Description
Initial Technical & Interface Specs for Sol2.

Deliverable D5.6 – VALP v1.0 (Sol2)

Deliverable Number	D5.6	Lead Beneficiary	25 - DBL
Deliverable Name	VALP v1.0 (Sol2)		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	8	Work Package No	WP5

Description
Preliminary Validation Plan for Sol2.

Deliverable D5.7 – OSED v1.0 (Sol2)

Deliverable Number	D5.7	Lead Beneficiary	3 - AP-Tech
Deliverable Name	OSED v1.0 (Sol2)		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	8	Work Package No	WP5

Description
Operational Service & Environment Definition for Sol2..

Deliverable D5.8 – OSED v2.0 (Sol2)

Deliverable Number	D5.8	Lead Beneficiary	3 - AP-Tech
Deliverable Name	OSED v2.0 (Sol2)		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	16	Work Package No	WP5

Description
Intermediate Operational Service & Environment Definition for Sol2

Deliverable D5.9 – TS/IRS v2.0 (Sol2)

Deliverable Number	D5.9	Lead Beneficiary	3 - AP-Tech
Deliverable Name	TS/IRS v2.0 (Sol2)		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	16	Work Package No	WP5

Description
Intermediate Technical & Interface Specs for Sol2.

Deliverable D5.10 – VALP v2.0 (Sol2)

Deliverable Number	D5.10	Lead Beneficiary	25 - DBL
Deliverable Name	VALP v2.0 (Sol2)		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	16	Work Package No	WP5

Description
Intermediate Validation Plan for Sol2.

Deliverable D6.1 – STAND v3.0 (Sol2)

Deliverable Number	D6.1	Lead Beneficiary	14 - DSNA
Deliverable Name	STAND v3.0 (Sol2)		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	21	Work Package No	WP6

Description
Standardisation pack for Sol2.

Deliverable D6.2 – REG v3.0 (Sol2)

Deliverable Number	D6.2	Lead Beneficiary	14 - DSNA
Deliverable Name	REG v3.0 (Sol2)		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	21	Work Package No	WP6

Description
Regulatory pack for Sol2.

Deliverable D6.3 – OSED v3.0 (Sol2)

Deliverable Number	D6.3	Lead Beneficiary	3 - AP-Tech
Deliverable Name	OSED v3.0 (Sol2)		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	21	Work Package No	WP6

Description
Intermediate Operational Service & Environment Definition for Sol2.

Deliverable D6.4 – TS/IRS v3.0 (Sol2)

Deliverable Number	D6.4	Lead Beneficiary	3 - AP-Tech
Deliverable Name	TS/IRS v3.0 (Sol2)		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	21	Work Package No	WP6

Description
Intermediate Technical & Interface Specs for Sol2.

Deliverable D6.5 – CBA v1.0 (Sol2)

Deliverable Number	D6.5	Lead Beneficiary	3 - AP-Tech
Deliverable Name	CBA v1.0 (Sol2)		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	21	Work Package No	WP6

Description
Initial Cost-Benefit Analysis Sol2.

Deliverable D6.6 – VALP v3.0 (Sol2)

Deliverable Number	D6.6	Lead Beneficiary	25 - DBL
Deliverable Name	VALP v3.0 (Sol2)		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	23	Work Package No	WP6

Description
Validation Plan for Sol2.

Deliverable D6.7 – VALR (Sol2)

Deliverable Number	D6.7	Lead Beneficiary	25 - DBL
Deliverable Name	VALR (Sol2)		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	31	Work Package No	WP6

Description
Validation Report for Sol2.

Deliverable D6.8 – OSED v4.0 (Sol2)

Deliverable Number	D6.8	Lead Beneficiary	3 - AP-Tech
Deliverable Name	OSED v4.0 (Sol2)		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	32	Work Package No	WP6

Description
Final Operational Service & Environment Definition for Sol3.

Deliverable D6.9 – TS/IRS v4.0 (Sol2)

Deliverable Number	D6.9	Lead Beneficiary	3 - AP-Tech
Deliverable Name	TS/IRS v4.0 (Sol2)		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	32	Work Package No	WP6

Description
Technical & Interface Specs for Sol2.

Deliverable D6.10 – STAND v4.0 (Sol2)

Deliverable Number	D6.10	Lead Beneficiary	14 - DSNA
Deliverable Name	STAND v4.0 (Sol2)		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	32	Work Package No	WP6

Description
Final Standardisation pack for Sol2.

Deliverable D6.11 – REG v4.0 (Sol2)

Deliverable Number	D6.11	Lead Beneficiary	14 - DSNA
Deliverable Name	REG v4.0 (Sol2)		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	32	Work Package No	WP6

Description
Final Regulatory pack for Sol2.

Deliverable D6.12 – CBA v2.0 (Sol2)

Deliverable Number	D6.12	Lead Beneficiary	3 - AP-Tech
Deliverable Name	CBA v2.0 (Sol2)		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	32	Work Package No	WP6

Description
Cost-Benefit Analysis Sol2.

Deliverable D6.13 – CN (Sol2)

Deliverable Number	D6.13	Lead Beneficiary	3 - AP-Tech
Deliverable Name	CN (Sol2)		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	32	Work Package No	WP6

Description
Contextual Note for Sol2.

Deliverable D7.1 – STAND v1.0 (Sol3)

Deliverable Number	D7.1	Lead Beneficiary	12 - EUROCONTROL
Deliverable Name	STAND v1.0 (Sol3)		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	3	Work Package No	WP7

Description
Initial standardisation inputs for Sol3.

Deliverable D7.2 – REG v1.0 (Sol3)

Deliverable Number	D7.2	Lead Beneficiary	12 - EUROCONTROL
Deliverable Name	REG v1.0 (Sol3)		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	3	Work Package No	WP7

Description
Initial regulatory/approval considerations for Sol3.

Deliverable D7.3 – STAND v2.0 (Sol3)

Deliverable Number	D7.3	Lead Beneficiary	12 - EUROCONTROL
Deliverable Name	STAND v2.0 (Sol3)		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	8	Work Package No	WP7

Description
Updated standardisation inputs for Sol3..

Deliverable D7.4 – REG v2.0 (Sol3)

Deliverable Number	D7.4	Lead Beneficiary	12 - EUROCONTROL
Deliverable Name	REG v2.0 (Sol3)		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	8	Work Package No	WP7

Description
Updated regulatory inputs for Sol3.

Deliverable D7.5 – TS/IRS v1.0 (Sol3)

Deliverable Number	D7.5	Lead Beneficiary	1 - INDRA
Deliverable Name	TS/IRS v1.0 (Sol3)		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	8	Work Package No	WP7

Description
Initial Technical & Interface Specs for Sol3.

Deliverable D7.6 – VALP v1.0 (Sol3)

Deliverable Number	D7.6	Lead Beneficiary	19 - ENAV
Deliverable Name	VALP v1.0 (Sol3)		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	8	Work Package No	WP7

Description
Preliminary Validation Plan for Sol3.

Deliverable D7.7 – OSED v1.0 (Sol3)

Deliverable Number	D7.7	Lead Beneficiary	15 - LFV
Deliverable Name	OSED v1.0 (Sol3)		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	8	Work Package No	WP7

Description
Operational Service & Environment Definition for Sol3.

Deliverable D8.1 – STAND v3.0 (Sol3)

Deliverable Number	D8.1	Lead Beneficiary	12 - EUROCONTROL
Deliverable Name	STAND v3.0 (Sol3)		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	21	Work Package No	WP8

Description
Standardisation pack for Sol3.

Deliverable D8.2 – REG v3.0 (Sol3)

Deliverable Number	D8.2	Lead Beneficiary	12 - EUROCONTROL
Deliverable Name	REG v3.0 (Sol3)		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	21	Work Package No	WP8

Description
Regulatory pack for Sol3.

Deliverable D8.3 – OSED v2.0 (Sol3)

Deliverable Number	D8.3	Lead Beneficiary	15 - LFV
Deliverable Name	OSED v2.0 (Sol3)		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	21	Work Package No	WP8

Description
Intermediate Operational Service & Environment Definition for Sol3.

Deliverable D8.4 – TS/IRS v2.0 (Sol3)

Deliverable Number	D8.4	Lead Beneficiary	1 - INDRA
Deliverable Name	TS/IRS v2.0 (Sol3)		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	21	Work Package No	WP8

Description
Intermediate Technical & Interface Specs for Sol3.

Deliverable D8.5 – CBA v1.0 (Sol3)

Deliverable Number	D8.5	Lead Beneficiary	15 - LFV
Deliverable Name	CBA v1.0 (Sol3)		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	21	Work Package No	WP8

Description
Initial Cost-Benefit Analysis Sol3.

Deliverable D8.6 – VALP v2.0 (Sol3)

Deliverable Number	D8.6	Lead Beneficiary	19 - ENAV
Deliverable Name	VALP v2.0 (Sol3)		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	22	Work Package No	WP8

Description
Validation Plan for Sol3.

Deliverable D8.7 – VALR (Sol3)

Deliverable Number	D8.7	Lead Beneficiary	25 - DBL
Deliverable Name	VALR (Sol3)		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	31	Work Package No	WP8

Description
Validation Report for Sol3.

Deliverable D8.8 – OSED v3.0 (Sol3)

Deliverable Number	D8.8	Lead Beneficiary	15 - LFV
Deliverable Name	OSED v3.0 (Sol3)		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	32	Work Package No	WP8

Description
Final Operational Service & Environment Definition for Sol3.

Deliverable D8.9 – TS/IRS v3.0 (Sol3)

Deliverable Number	D8.9	Lead Beneficiary	1 - INDRA
Deliverable Name	TS/IRS v3.0 (Sol3)		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	32	Work Package No	WP8

Description
Technical & Interface Specs for Sol3.

Deliverable D8.10 – STAND v4.0 (Sol3)

Deliverable Number	D8.10	Lead Beneficiary	12 - EUROCONTROL
Deliverable Name	STAND v4.0 (Sol3)		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	32	Work Package No	WP8

Description
Final Standardisation pack for Sol3.

Deliverable D8.11 – REG v4.0 (Sol3)

Deliverable Number	D8.11	Lead Beneficiary	12 - EUROCONTROL
Deliverable Name	REG v4.0 (Sol3)		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	32	Work Package No	WP8

Description
Final Regulatory pack for Sol3.

Deliverable D8.12 – CBA v2.0 (Sol3)

Deliverable Number	D8.12	Lead Beneficiary	15 - LFV
Deliverable Name	CBA v2.0 (Sol3)		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	32	Work Package No	WP8

Description
Cost-Benefit Analysis Sol3.

Deliverable D8.13 – CN (Sol3)

Deliverable Number	D8.13	Lead Beneficiary	1 - INDRA
Deliverable Name	CN (Sol3)		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	32	Work Package No	WP8

Description
Contextual Note for Sol3.

Deliverable D9.1 – STAND v1.0 (Sol4)

Deliverable Number	D9.1	Lead Beneficiary	12 - EUROCONTROL
Deliverable Name	STAND v1.0 (Sol4)		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	3	Work Package No	WP9

Description
Initial standardisation inputs for Sol4.

Deliverable D9.2 – REG v1.0 (Sol4)

Deliverable Number	D9.2	Lead Beneficiary	4 - AIA
Deliverable Name	REG v1.0 (Sol4)		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	3	Work Package No	WP9

Description
Initial regulatory/approval considerations for Sol4.

Deliverable D9.3 – STAND v2.0 (Sol4)

Deliverable Number	D9.3	Lead Beneficiary	12 - EUROCONTROL
Deliverable Name	STAND v2.0 (Sol4)		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	8	Work Package No	WP9

Description
Updated standardisation inputs for Sol4.

Deliverable D9.4 – REG v2.0 (Sol4)

Deliverable Number	D9.4	Lead Beneficiary	4 - AIA
Deliverable Name	REG v2.0 (Sol4)		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	8	Work Package No	WP9

Description
Updated regulatory inputs for Sol4.

Deliverable D9.5 – TS/IRS v1.0 (Sol4)

Deliverable Number	D9.5	Lead Beneficiary	1 - INDRA
Deliverable Name	TS/IRS v1.0 (Sol4)		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	8	Work Package No	WP9

Description
Initial Technical & Interface Specs for Sol4.

Deliverable D9.6 – OSED v1.0 (Sol4)

Deliverable Number	D9.6	Lead Beneficiary	4 - AIA
Deliverable Name	OSED v1.0 (Sol4)		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	8	Work Package No	WP9

Description
Operational Service & Environment Definition for Sol4.

Deliverable D9.7 – VALP v1.0 (Sol4)

Deliverable Number	D9.7	Lead Beneficiary	23 - DLR
Deliverable Name	VALP v1.0 (Sol4)		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	8	Work Package No	WP9

Description
Preliminary Validation Plan for Sol4.

Deliverable D10.1 – STAND v3.0 (Sol4)

Deliverable Number	D10.1	Lead Beneficiary	12 - EUROCONTROL
Deliverable Name	STAND v3.0 (Sol4)		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	21	Work Package No	WP10

Description
Standardisation pack for Sol4.

Deliverable D10.2 – REG v3.0 (Sol4)

Deliverable Number	D10.2	Lead Beneficiary	4 - AIA
Deliverable Name	REG v3.0 (Sol4)		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	21	Work Package No	WP10

Description
Regulatory pack for Sol4.

Deliverable D10.3 – OSED v2.0 (Sol4)

Deliverable Number	D10.3	Lead Beneficiary	4 - AIA
Deliverable Name	OSED v2.0 (Sol4)		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	21	Work Package No	WP10

Description
Intermediate Operational Service & Environment Definition for Sol4

Deliverable D10.4 – TS/IRS v2.0 (Sol4)

Deliverable Number	D10.4	Lead Beneficiary	1 - INDRA
Deliverable Name	TS/IRS v2.0 (Sol4)		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	21	Work Package No	WP10

Description
Intermediate Technical & Interface Specs for Sol4.

Deliverable D10.5 – CBA v1.0 (Sol4)

Deliverable Number	D10.5	Lead Beneficiary	4 - AIA
Deliverable Name	CBA v1.0 (Sol4)		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	21	Work Package No	WP10

Description
Initial Cost-Benefit Analysis Sol4.

Deliverable D10.6 – VALP v2.0 (Sol4)

Deliverable Number	D10.6	Lead Beneficiary	23 - DLR
Deliverable Name	VALP v2.0 (Sol4)		
Type	R — Document, report	Dissemination Level	SEN - Sensitive
Due Date (month)	23	Work Package No	WP10

Description
Validation Plan for Sol4.

Deliverable D10.7 – VALR (Sol4)

Deliverable Number	D10.7	Lead Beneficiary	23 - DLR
Deliverable Name	VALR (Sol4)		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	31	Work Package No	WP10

Description
Validation Report for Sol4.

Deliverable D10.8 – OSED v3.0 (Sol4)

Deliverable Number	D10.8	Lead Beneficiary	4 - AIA
Deliverable Name	OSED v3.0 (Sol4)		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	32	Work Package No	WP10

Description
Final Operational Service & Environment Definition for Sol4.

Deliverable D10.9 – TS/IRS v3.0 (Sol4)

Deliverable Number	D10.9	Lead Beneficiary	1 - INDRA
Deliverable Name	TS/IRS v3.0 (Sol4)		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	32	Work Package No	WP10

Description
Technical & Interface Specs for Sol4.

Deliverable D10.10 – STAND v4.0 (Sol4)

Deliverable Number	D10.10	Lead Beneficiary	12 - EUROCONTROL
Deliverable Name	STAND v4.0 (Sol4)		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	32	Work Package No	WP10

Description
Final Standardisation pack for Sol4.

Deliverable D10.11 – REG v4.0 (Sol4)

Deliverable Number	D10.11	Lead Beneficiary	4 - AIA
Deliverable Name	REG v4.0 (Sol4)		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	32	Work Package No	WP10

Description
Final Regulatory pack for Sol4..

Deliverable D10.12 – CBA v2.0 (Sol4)

Deliverable Number	D10.12	Lead Beneficiary	4 - AIA
Deliverable Name	CBA v2.0 (Sol4)		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	32	Work Package No	WP10

Description
Final Cost-Benefit Analysis Sol4.

Deliverable D10.13 – CN (Sol4)

Deliverable Number	D10.13	Lead Beneficiary	4 - AIA
Deliverable Name	CN (Sol4)		
Type	R — Document, report	Dissemination Level	PU - Public
Due Date (month)	32	Work Package No	WP10

Description
Contextual Note for Sol4.

Deliverable D11.1 – CDE Plan v1.0

Deliverable Number	D11.1	Lead Beneficiary	1 - INDRA
Deliverable Name	CDE Plan v1.0		
Type	DEC — Websites, patent filings, videos, etc	Dissemination Level	PU - Public
Due Date (month)	3	Work Package No	WP11

Description
Initial Communication, Dissemination & Exploitation Plan.

Deliverable D11.2 – CDE Plan v2.0

Deliverable Number	D11.2	Lead Beneficiary	1 - INDRA
Deliverable Name	CDE Plan v2.0		
Type	DEC — Websites, patent filings, videos, etc	Dissemination Level	PU - Public
Due Date (month)	8	Work Package No	WP11

Description
Updated CDE Plan pre-Review 1 (metrics & activities).

Deliverable D12.1 – CDE Plan 3.0

Deliverable Number	D12.1	Lead Beneficiary	1 - INDRA
Deliverable Name	CDE Plan 3.0		
Type	DEC — Websites, patent filings, videos, etc	Dissemination Level	PU - Public
Due Date (month)	21	Work Package No	WP12

Description
Updated CDE Plan before Review 2, including KPIs, outreach actions and exploitation progress.

Deliverable D12.2 – CDE Plan v4.0

Deliverable Number	D12.2	Lead Beneficiary	1 - INDRA
Deliverable Name	CDE Plan v4.0		
Type	DEC — Websites, patent filings, videos, etc	Dissemination Level	PU - Public
Due Date (month)	34	Work Package No	WP12

Description
Final CDE Plan with exploitation roadmap.

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	Project Kick-off	WP1	1 - INDRA	KoM held; minutes circulated; governance confirmed.	1
2	SOL1 KoM	WP3	2 - NLR	KoM minutes for Solution 1; scope & roles endorsed.	2
3	SOL2 KoM	WP5	3 - AP-Tech	KoM minutes for Solution 2; scope & roles endorsed.	2
4	SOL3 KoM	WP7	1 - INDRA	KoM minutes for Solution 3; scope & roles endorsed.	2
5	SOL4 KoM	WP9	4 - AIA	KoM minutes for Solution 4; scope & roles endorsed.	2
6	Project initiation package set-up	WP7, WP11, WP1, WP3, WP9, WP5	1 - INDRA	BIM baselined	3
7	DMP + STAND/REG v1.0 baseline	WP7, WP1, WP3, WP9, WP5	1 - INDRA	EPC baseline logged	6
8	SOL1 Prototyping Start	WP3	2 - NLR	Sprint/Kick-off notes; repositories & dev logs; written start confirmations.	7
9	SOL2 Prototyping Start	WP5	3 - AP-Tech	Sprint/Kick-off notes; repositories & dev logs; written start confirmations.	7
10	SOL3 Prototyping Start	WP7	1 - INDRA	Sprint/Kick-off notes; repositories & dev logs; written start confirmations.	7
11	SOL4 Prototyping Start	WP9	4 - AIA	Sprint/Kick-off notes; repositories & dev logs; written start confirmations.	7

Milestones					
<i>Grant Preparation (Milestones screen) — Enter the info.</i>					
Milestone No	Milestone Name	Work Package No	Lead Beneficiary	Means of Verification	Due Date (month)
12	Complete all preliminary tasks before the submission of TRL4 VALP (SOL1)	WP3	2 - NLR	Completion of all preliminary tasks required before the submission of the Validation Plan (in particular, the readiness of the corresponding SPR-INTEROP/OSD and TS/IRS)	15
13	Readiness for TRL4 validation execution (SOL1)	WP3	2 - NLR	VALP approved; prototype, environment and resources available	16
14	Review-1 package ready	WP7, WP11, WP1, WP3, WP9, WP5	1 - INDRA	Risk log updated in SESAR STELLAR; PMP v2 (D1.3) & CDE v2.0 (D11.2) submitted; review pack sent to JU. Maturity Self Assessment	8
15	Exit Maturity Gate SOL1 (TRL-4)	WP4	2 - NLR	TRL-4 evidence accepted; Exit-Gate checklist approved in STELLAR	20
16	Complete all preliminary tasks before the submission of VALP SOL2	WP6	3 - AP-Tech	Completion of all preliminary tasks required before the submission of the Validation Plan (in particular, the readiness of the corresponding SPR-INTEROP/OSD and TS/IRS)	23
17	Readiness for TRL6 validation execution (SOL2)	WP6	3 - AP-Tech	VALP approved; prototype, environment and resources available	24
18	Complete all preliminary tasks before the submission of VALP SOL3	WP8	1 - INDRA	Completion of all preliminary tasks required before the submission of the Validation Plan (in particular, the readiness of the corresponding SPR-INTEROP/OSD and TS/IRS)	22
19	Readiness for TRL6 validation execution (SOL3)	WP8	1 - INDRA	VALP approved; prototype, environment and resources available	22

Milestones					
Grant Preparation (Milestones screen) — Enter the info.					
Milestone No	Milestone Name	Work Package No	Lead Beneficiary	Means of Verification	Due Date (month)
20	Complete all preliminary tasks before the submission of TRL6 VALP SOL4	WP10	4 - AIA	Completion of all preliminary tasks required before the submission of the Validation Plan (in particular, the readiness of the corresponding SPR-INTEROP/OSED and TS/IRS)	23
21	Readiness for TRL6 validation execution (SOL4)	WP10	4 - AIA	VALP approved; prototype, environment and resources available	28
22	Complete all preliminary tasks before the submission of TRL6 VALP SOL1	WP4	2 - NLR	Completion of all preliminary tasks required before the submission of the Validation Plan (in particular, the readiness of the corresponding SPR-INTEROP/OSED and TS/IRS)	23
23	Readiness for TRL6 validation execution (SOL1)	WP4	2 - NLR	VALP approved; prototype, environment and resources available	24
24	Review-2 package ready	WP10, WP6, WP8, WP2, WP4, WP12	1 - INDRA	Risk log updated in STELLAR; CDE v3.0 (D12.1) submitted; STAND/REG v3.0 for all Solutions (D4.1–4.2, D6.1–6.2, D8.1–8.2, D10.1–10.2) delivered. Maturity Self Assessment	21
25	SOL1 validation execution completed	WP4	2 - NLR	Execution logs; trial completion minutes.	31
26	SOL2 validation execution completed	WP6	3 - AP-Tech	Execution logs; trial completion minutes.	29
27	SOL3 validation execution completed	WP8	1 - INDRA	Execution logs; trial completion minutes.	30
28	SOL4 validation execution completed	WP10	4 - AIA	Execution logs; trial completion minutes.	30
29	Open/Demo Days held	WP12	1 - INDRA	Open/Demo Days held (per WP12 plan);	31
30	Pre-exit deliverables complete	WP10, WP6, WP8, WP2, WP4, WP12	1 - INDRA	VALR & CBA delivered for S2/S3/S4 (D6.8–6.9, D8.8–8.9, D10.8–10.9); TS/IRS v2.0 & OSED v2.0 where due (D6.5, D8.5, D10.5; D6.4, D8.4,	32

Milestones					
Grant Preparation (Milestones screen) — Enter the info.					
Milestone No	Milestone Name	Work Package No	Lead Beneficiary	Means of Verification	Due Date (month)
				D10.4); DMP v3 (D2.1); CDE v4.0 (D12.2) submitted.	
31	Exit Maturity Gate SOL1 (TRL-6)	WP4	2 - NLR	TRL-6 evidence accepted; VALR approved; OSED/TS-IRS v2.0 baselined; Exit-Gate checklist approved in STELLAR.	34
32	Exit Maturity Gate SOL2 (TRL-6)	WP6, WP5	3 - AP-Tech	TRL-6 evidence accepted; VALR approved; OSED/TS-IRS v2.0 baselined; Exit-Gate checklist approved in STELLAR.	34
33	Exit Maturity Gate SOL3 (TRL-6)	WP7, WP8	1 - INDRA	TRL-6 evidence accepted; VALR approved; OSED/TS-IRS v2.0 baselined; Exit-Gate checklist approved in STELLAR.	34
34	Exit Maturity Gate SOL4 (TRL-6)	WP10, WP9	4 - AIA	TRL-6 evidence accepted; VALR approved; OSED/TS-IRS v2.0 baselined; Exit-Gate checklist approved in STELLAR.	34
35	Project closure & dissemination close-out	WP2, WP12	1 - INDRA	Final reports submitted; close-out workshop(s); social/press per WP12; risk log closed.	36
36	Project Review #1	WP1	1 - INDRA	First project review	9
37	Project Review #2	WP2	1 - INDRA	Second project review	21

LIST OF CRITICAL RISKS

Critical risks & risk management strategy <i>Grant Preparation (Critical Risks screen) — Enter the info.</i>			
Risk number	Description	Work Package No(s)	Proposed Mitigation Measures
1	Misalignment in planning/deliverables across technical WPs impacts consistency and SESAR reporting.	WP2, WP1	Content checkpoints tied to SESAR milestones; shared templates; internal peer reviews before submission.
2	Delayed risklog updates or escalation leads to unmanaged critical risks.	WP2, WP1	Bimonthly ($\geq$ every 2 months) risk reviews; nominate WP risk focal points; systematic use of SESAR 3 JU tool for tracking/escalation.
3	DMP not maintained → FAIR noncompliance or weak review outcomes.	WP2, WP1	DMP gates at M6/M18/M33; assign data stewards per WP; follow SESAR/HE DMP templates; audit data flows.
4	Misalignment with common Service Delivery Model and cybersecurity baseline.	WP7, WP10, WP6, WP8, WP2, WP1, WP3, WP9, WP4, WP5	Central governance for SDM/cyber; version controlled guidelines; quarterly cross solution alignment sessions; conformance checks at design freeze.
5	TRL6 gate not achieved due to missing evidence/safety concerns.	WP10, WP6, WP8, WP4	Map TRL6 criteria to VALP; transversal reviewer checkpoints; reserve time for corrective actions & retests.
6	Integration challenges of solution prototypes in live-trial environment.	WP3, WP4	Coordinate with local operational partners on how to loosely integrate prototype systems that may interfere with operational systems
7	The solution 1 team possesses strong operational expertise, but the effort is dispersed across the tasks.	WP3, WP4	Set clear priorities. Define roles and responsibilities. Plan capacity carefully. Limit multitasking. Review focus regularly.
8	GNSS spoofing/jamming detection quality insufficient for operations.	WP6, WP5	Benchmark techniques; multi-sensor cross-checks; thresholds & alerts tuned with ANSPs; contingency procedures.
9	Centralised SOA (SMAS) under-performs under load.	WP5	Load/stress tests in near-ops env.; horizontal scaling and caching; real-time load monitoring & autoscaling.

Critical risks & risk management strategy <i>Grant Preparation (Critical Risks screen) — Enter the info.</i>			
Risk number	Description	Work Package No(s)	Proposed Mitigation Measures
10	SOA cloud deployment under-performs under load.	WP6	Cloud capacity planning; autoscaling; performance SLOs; continuous profiling/monitoring.
11	Excessive latency from ADS-B capture → cloud → controller display.	WP6	Low-latency networking; time-sync (PTP/NTP); API performance tests; edge pre-processing where feasible.
12	Latency/instability on Network Manager links causes data misalignment.	WP6, WP5	Asynchronous patterns and buffering; connection redundancy; end-to-end monitoring/alerts; strict time-sync.
13	OSD gaps (edge cases: unusual traffic, weather) force redesign later.	WP7, WP8	Iterative OSD reviews (M6/M12); early controller workshops; maintain an assumptions log; update OSD in WP8.
14	Integration challenges between AI modules, DTWR platform and surveillance.	WP8	Freeze TS/IRS by M26; interface prototypes in WP7; incremental integration with CI; interface conformance tests.
15	Validation-site readiness delays (ENAV, HUNGAROCONTROL, etc.).	WP8	Site readiness checks; fallback remote/hybrid validation; schedule buffer; early logistics planning.
16	Human-factors rejection/distrust of AI assistance.	WP7, WP8	HITL sessions early; explainability in HMIs; iterative HMI refinements; targeted training materials.
17	Access to required airport/network data sources is restricted or delayed.	WP10, WP1, WP9	Early data-source register; NDAs/MoUs in place by M3–M6; fallback to synthetic/anonymised datasets; plan phased data onboarding.
18	Reliability/representativeness of data for AI/analytics is insufficient.	WP10, WP9	Co-design of datasets with ops staff; create cleaned reference datasets early; continuous

Critical risks & risk management strategy <i>Grant Preparation (Critical Risks screen) — Enter the info.</i>			
Risk number	Description	Work Package No(s)	Proposed Mitigation Measures
			data quality KPIs; retraining plan.
19	Data confidentiality constraints limit sharing/validation.	WP10, WP1, WP9	Data minimisation/anonymisation; strict access control; NDAs; segregated environments; publish only aggregated KPIs.
20	Technical constraints in third-party interfaces (AODB, NM, platform APIs).	WP10, WP9	Early involvement of vendor experts; interface specs signed-off; prototyping stubs; change control board for interface issues.
21	Low partner engagement or delayed inputs in CDE activities.	WP11, WP12	Clear CDE roles/KPIs; editorial calendar; reminder cadence; highlight contributions at reviews.
22	Exploitable results not captured/owned on time.	WP12	Start KER tracking at M12; exploitation PoCs per WP; include KER status in CDE updates; ownership agreed in CA.
23	Poor visibility of validation outcomes reduces stakeholder uptake.	WP12	Plan Open/Demo Days early; co-promote with airports/ANSPs and SESAR JU; package results into briefs/videos.
24	Changes in the EUROCONTROL team and the unavailability of proposal-phase experts may impact continuity and the timely execution of EUPHORIA activities. Mitigation measures include early onboarding of alternative expertise, structured knowledge transfer, and close coordination with the project coordinator.	WP7, WP10, WP6, WP8, WP11, WP3, WP9, WP4, WP5, WP12	Close coordination with Eurocontrol to minimize the impact.

PROJECT REVIEWS

Project Reviews			
Grant Preparation (Reviews screen) — Enter the info.			
Review No	Timing (month)	Location	Comments
RV1	21	Brussels	

JU CONTRIBUTIONS

PIC	Legal Name	Membership	IKOP	Financial Contribution	IKAA
885702054	AP-TECH SP. Z O.O.	No	€ 0.00	€ 0.00	€ 0.00
888386529	PORT LOTNICZY WROCLAW SA	No	€ 0.00	€ 0.00	€ 0.00
904539842	INDRA SOLUCIONES TECNOLOGIAS DE LA INFORMACION SL	Yes (Founding Member Affiliate)	€ 136 209.00	€ 0.00	€ 0.00
905290040	PORT LOTNICZY GDANSK SP ZOO	No	€ 0.00	€ 0.00	€ 0.00
928673636	DIRECTION DES SERVICES DE LA NAVIGATION AERIENNE	Yes (Founding Member)	€ 266 154.30	€ 0.00	€ 0.00
938275375	AVINOR AS	No	€ 0.00	€ 0.00	€ 0.00
941608877	TECHNO SKY SRL TECHNOLOGIES FOR AIR TRAFFIC MANAGEMENT	Yes (Founding Member Affiliate)	€ 82 572.38	€ 0.00	€ 0.00
941767472	HUNGAROCONTROL MAGYAR LEGIFORGALMISZOLGALAT ZARTKORUEN MUKODO RESZVENYTARSASAG	Yes (Founding Member)	€ 35 314.38	€ 0.00	€ 0.00
942346077	LUFTFARTSVERKET	Yes (Founding Member)	€ 137 399.67	€ 0.00	€ 0.00

PIC	Legal Name	Membership	IKOP	Financial Contribution	IKAA
950806223	KOBENHAVNS LUFTHAVNE AS	Yes (Founding Member)	€ 31 950.00	€ 0.00	€ 0.00
952207194	GOLDAIR EXYPIRETISEIS EDAFOUS ANONIMI ETAIREIA	No	€ 0.00	€ 0.00	€ 0.00
952375586	INDRA NAVIA AS	Yes (Founding Member Affiliate)	€ 607 005.10	€ 0.00	€ 0.00
957080474	AEROPORTS DE PARIS SA	Yes (Founding Member)	€ 185 220.00	€ 0.00	€ 0.00
991247948	AIRBUS OPERATIONS SAS	Yes (Founding Member Affiliate)	€ 22 918.69	€ 0.00	€ 0.00
995562023	POLSKA AGENCJA ZEGLUGI POWIETRZNEJ	Yes (Founding Member)	€ 115 762.50	€ 0.00	€ 0.00
996375756	ECOLE NATIONALE DE L AVIATION CIVILE	Yes (Founding Member)	€ 94 425.00	€ 0.00	€ 0.00
996607489	NEXT INGEGNERIA DEI SISTEMI SPA	No	€ 0.00	€ 0.00	€ 0.00
997605619	CENTRO DE REFERENCIA INVESTIGACION DESARROLLO E INNOVACION ATM, A.I.E.	Yes (Founding Member Affiliate)	€ 42 843.75	€ 0.00	€ 0.00
997701843	ENAI	Yes (Founding Member)	€ 25 312.50	€ 0.00	€ 0.00
998162690	PILDO CONSULTING SL	No	€ 0.00	€ 0.00	€ 0.00
998197513	ENAV SPA	Yes (Founding Member)	€ 77 486.07	€ 0.00	€ 0.00
998325941	DEEP BLUE SRL	No	€ 0.00	€ 0.00	€ 0.00
999483733	EUROCONTROL - EUROPEAN ORGANISATION FOR THE SAFETY OF AIR NAVIGATION	Yes (Founding Member)	€ 4 326 031.00	€ 0.00	€ 0.00
999484994	ATHENS INTERNATIONAL AIRPORT S.A.	Yes (Founding Member)	€ 310 162.50	€ 0.00	€ 0.00
999931388	SCHIPHOL NEDERLAND BV	Yes (Founding Member)	€ 248 775.00	€ 0.00	€ 0.00
999959130	INDRA SISTEMAS SA	Yes (Founding Member)	€ 1 197 940.15	€ 0.00	€ 0.00
999963010	AIRBUS	Yes (Founding Member)	€ 17 592.56	€ 0.00	€ 0.00
999981731	DEUTSCHES ZENTRUM FUR LUFT - UND RAUMFAHRT EV	Yes (Founding Member)	€ 242 523.93	€ 0.00	€ 0.00
999987066	STICHTING KONINKLIJK NEDERLANDS LUCHT - EN RUIMTEVAARTCENTRUM	Yes (Founding Member)	€ 195 798.09	€ 0.00	€ 0.00

Proposal template Part B: technical description

NEURON: NEW aiRPORT OPERATIONAL SERVICE NETWORK

History of changes

Procedure: GAP		
Part B	Section	Description of change and Reason/justification for change (if applicable)
	Section 3.1	Remove "Purchase Costs" and "Other costs categories" tables
	Section 1	Remove the participants lists
	Section 4	New section called "Ethics Self-Assessment"
	Section 3	List of deliverables updated.

1 Excellence

The modernisation of Air Traffic Management (ATM) across Europe is focused on achieving the **Digital European Sky**, guided by the European ATM Master Plan. The **2025 edition of the European ATM Master Plan sets a clear path** towards a digital and green Digital European Sky with the strategic deployment objectives (SDOs) to be implemented by 2035 and the development priorities (DPs) for the next years expected to be implemented until 2045. Within this framework, SESAR 3 seeks to deliver a coherent set of solutions aligned with the priorities of the European ATM Master Plan. The SESAR research and innovation pipeline consists of Exploratory Research (ER), Industrial Research (IR) and Digital Sky Demonstrators (DSDs), with Fast-Track Innovation and Uptake activities aimed at accelerating high-risk, high-gain solutions towards market readiness. The **Digital European Sky Industrial Research 02 (HORIZON-SESAR-2025-DES-IR-02) call** under Horizon Europe complements the first industrial research call and **supports these Industrial Research efforts**, structured into seven Work Areas (WA1–WA7). WA1 to WA6 are aligned with development priorities, while WA7 focuses on transversal activities supporting SESAR 3 JU and the broader R&I programme.

This proposal specifically falls under **WA4**, which covers DP IR-04: **Future airport platform** of the European ATM Master Plan 2025 and addresses the **WA 4.1 Next generation platform for airport operations** topic. It focuses on the evolution of airport operations, from terminal processes to aircraft turnaround, taxi, and take-off and landing clearances, into a highly automated environment supported by Artificial Intelligence (AI) based technologies. The future airport platform aims to incorporate advanced technologies for a service-oriented model that allows dynamic capacity adjustment, improving aerodrome safety and environmental sustainability.

1.1 Objectives and ambition

The Digital European Sky vision is set to revolutionise ATM through four transitional phases (A to D), culminating in a fully scalable system for both manned and unmanned aviation that exceeds current safety standards. **Phase D**, the final stage, introduces **ambitious advancements** such as higher automation, trajectory-based operations, dynamic airspace management and green aviation technologies, including zero-emission aircraft. It also focuses on critical R&I priorities, encompassing cybersecurity, seamless multi-link communications and the integration of Innovative Air Mobility (IAM) solutions, such as drones and air taxis, ensuring efficient operations in increasingly complex airspace environments.

To unlock the full potential of the Digital European Sky, the WA 4.1 address three airport bottlenecks—low automation, fragmented interoperability, and high lifecycle costs. Overcoming the challenges of ATM requires supporting the **data-sharing service delivery model** and **connection with other airports and their third parties** (e.g. ground handlers), **ANSPs, NM and CNS/MET as a service toward holistic view of airport operations and integration within the network**.

The goal of NEURON (NEw aiRport Operational service Network) is to create a future airport platform that introduces innovative services and functionalities aimed at enhancing airport and network operations. This will be achieved through a flexible, scalable, safe, efficient, resilient and sustainable approach, leveraging AI Automation. By M36, all four Solutions will reach TRL-6, with performance measured against the KPIs in Table 3 (Section 2.1). This high-level objective will be achieved through the development and validation of 4 different solutions presented in Figure 1 and described as follows:

- **Solution 1 – Integrated management of sustainable taxiing operations at the airport:** Single-engine and engine-off taxiing with autonomous towing and AI-based taxi management to optimise fuel burn, engine start and Target

Take-Off Time (TTOT) coordination. It develops an integrated management solutions for single-engine and engine-off taxiing operations at medium to large airports. *SMART objective (by M36): Demonstrate improved taxi time predictability and reduced taxi out CO₂ via mixed taxi modes.*

- Solution 2 - Cost-effective aerodrome traffic awareness integrated with AI-powered NM tools: Numerous airports, especially small and medium-sized ones, lack cost-effective and scalable surveillance systems to ensure situational awareness on the manoeuvring area, and full A-SMGCS systems are often economically infeasible for these cases. The solution proposes new enhanced SMAS (Surface Movement Awareness System) as an alternative delivering Surveillance and Safety Support services that can be deployed as a centralized service, integrated with NM or as A-SMGCS fall-back capability. *SMART objective (by M36): Deploy SMAS prototypes at 2–3 regional airports, with validated NM/ECRA integration and safety-net performance.*
- Solution 3 - AI automated tracking for digital towers and aerodrome operations: AI-enabled visual recognition of aircraft and vehicles to support aerodrome operations and automated surface safety monitoring. It proposes the development of an AI-based visual Intelligence system integrated into digital tower and airport platforms. This solution combines four advanced modules that enhance situational awareness, surface management, and human-machine teaming in aerodrome operations. *SMART objective (by M36): achieve Automation Level 4 in perception and AL3 in analysis, with the tracking and weather modules integrated in DTWR HMIs, while achieving Automation Level 2 for aerodrome safety module.*
- Solution 4 – Advanced AOP & Airport-Network Integration: End-to-end Demand Capacity Balancing (DCB) functionalities for a more accurate planning and prediction within the AOP context & NOP-AOP data exchange through airport operations hyper vision view built on the predictions available on the Network side along the different phases (pre-tactical, execution and post operations) that would allow proactive actions towards more accurate planning at airport level and introduce a structured, technology-driven solution, available for the Network Manager and all stakeholders, allowing for a standardized approach for verifying the quality of the information transmitted to NM. *SMART objective (by M36): Demonstrate holistic DCB in AOP with measurable AOP–NOP improvements in arrival/departure predictability.*

Figure 1. Solutions under the scope of NEURON project



The following Table 1 describes how the proposed NEURON Solutions will bring the expected capabilities under this WA 4-1 and to which development priorities will contribute.

Table 1. Traceability matrix links solutions, industrial research (IR), and capabilities, using a green scale to indicate the level of support, with darker green showing stronger alignment

High relevance		Medium relevance		Low relevance				
Capabilities (CAP)/ Industrial Research Priorities (IR)	IR-1-01 Integrated air/ground trajectory management	IR-4-01 Next generation airport platform	IR-4-02 Artificial Intelligence (AI)	IR-4-03 Cyber-resilience and Cyber-security	IR-4-04 Airport solutions for reducing env. impact operations	IR-4-05 Future human - machine teaming	IR-4-06 Optimisation of runway throughput	Solution contribution
CAP#1 Climate impact reduction		Solution 1 Solution 2 Solution 3			Solution 1	Solution 1 Solution 3		Sol#1: reduces climate impact by lowering greenhouse gas emissions through increased use of engine-off and single-engine taxiing, and by cutting local air pollutants (NO _x and particulate matter) Sol#2: Better predictability of key turnaround timestamps reduces taxi-out delays and emissions. The centralised based solution contributes to the Solution scalability with an optimised IT infrastructure. Sol#3: Reduces taxi/idling through better coordination via real-time ground tracking
CAP#2 Flight trajectory optimisation	Solution 1 Solution 4	Solution 1 Solution 2 Solution 3			Solution 1	Solution 1		Sol #1: ATS platform with new STX capabilities offer better management and predictability of 4D trajectories, thanks to efficient taxi routes and times calculation and sharing. Sol#2: new SMAS contributes to the integration and connectivity of regional airports to the NM, taking advantage of the existing ECRA tool. Sol#3: Supports better ground handling and stand allocation with accurate real-time data Sol#4: The holistic DCB supports better allocation of ground resources (e.g. stand allocation) allowing more accurate planning and increased arrival and departure predictability.
CAP#3 Surface management	Solution 3 Solution 4	Solution 1 Solution 2 Solution 3 Solution 4	Solution 3	Solution 2	Solution 1		Solution 1 Solution 2	Sol#1: Provides improved surface management coordinating tug movements in real time, enhancing flexibility across taxiing modes, and improving predictability and throughput. Accurate monitoring and planning allow for emission-based decisions. Sol#2: Enables basic situational awareness using ADS-B and safety alerts. Brings surveillance and safety support to underserved airports. Additional sensors e.g. video, barriers can enhance positional information and detect and track non-cooperative vehicles. Centralized cloud-based SMAS offer more robust system in term of cyber. Sol#3: Enhances situational awareness and automated surface monitoring

Capabilities (CAP)/ Industrial Research Priorities (IR)	IR-1-01 Integrated air/ground trajectory management	IR-4-01 Next generation airport platform	IR-4-02 Artificial Intelligence (AI)	IR-4-03 Cyber-resilience and Cyber-security	IR-4-04 Airport solutions for reducing env. impact operations	IR-4-05 Future human - machine teaming	IR-4-06 Optimisation of runway throughput	Solution contribution
								Sol#4: Enhances situational awareness at holistic airport level, through an advanced AOP, consolidating all airport key processes.
CAP#4 Scaling capacity	Solution 1 Solution 3 Solution 4	Solution 1 Solution 3 Solution 4	Solution 1 Solution 3		Solution 1		Solution 1 Solution 3 Solution 4	Sol#1: Optimised routing and dynamic taxi time predictions increase taxiway throughput and reduce taxiway congestion, allowing more ATM/h. By enabling efficient resource allocation and mixed taxiing modes, AI-driven management systems help airports handle higher traffic volumes sustainably without major infrastructure changes. Sol#3: Enables adaptation to congestion through predictive ground occupancy models. Sol#4: Improved capacity adjustments are implemented in real time, due to more accurate planning and predictions in AOP context, ensuring optimal use of resources.
CAP#5 Cybersecurity enhancement		Solution 2		Solution 2 Solution 3				Sol#2: Detects GNSS spoofing/jamming and ADS-B anomalies. Video can supplement detection by identifying deviations between visual tracking and ADS-B data. Sol#3: Partially supported through the integration of Zero-Trust principles for secure data pipelines and sharing.
CAP#6 Connectivity and continuous optimisation	Solution 2 Solution 3 Solution 4	Solution 1 Solution 4						Sol#1: Enhances connectivity by integrating tug management, taxi planning, and environmental data with airport operational platforms (e.g., AOP, CDM, D-MAN), enabling seamless coordination of ground movements. It supports real-time decision-making and dynamic flow optimisation through adaptative information-driven tools. Sol#2: Shares milestones with NM and NM will integrate into ANI/CDM/AAT airports. Sol#3: Structured data enables continuous planning from gate to gate. Sol#4: Consolidated DCB functionalities and AOP-NOP integration based on SWIM protocols, connected to the network and increasing both arrival and departure predictability.
CAP#7 Automation level	Solution 2	Solution 1 Solution 2 Solution 4	Solution 1 Solution 2 Solution 3 Solution 4		Solution 1	Solution 1 Solution 2 Solution 3 Solution 4		Sol#1: It supports real-time decision-making identifying optimised (conflict and hassle-free) taxi routes and adequate taxi modes for emission-based decisions.

Capabilities (CAP)/ Industrial Research Priorities (IR)	IR-1-01 Integrated air/ground trajectory management	IR-4-01 Next generation airport platform	IR-4-02 Artificial Intelligence (AI)	IR-4-03 Cyber-resilience and Cyber-security	IR-4-04 Airport solutions for reducing env. impact operations	IR-4-05 Future human - machine teaming	IR-4-06 Optimisation of runway throughput	Solution contribution
								Sol#2: Provides automated safety nets, milestones sharing and anomaly detections to all airport stakeholders, particularly during low visibility conditions or in the event of an accident. Sol#3: Automates visual observation and weather monitoring Sol#4: Automated AOP performance monitoring
CAP#8 Machine-to-machine applications		Solution 1 Solution 2	Solution 4			Solution 2 Solution 4		Sol#1: This solution enables seamless integration of airport operational platforms and real-time data exchange Sol#2: SMAS uses service-based interfaces for surveillance and NM data exchange. Sol#4: Coordination between different airports and improving coordination between ECAC and non-ECAC regions. AI-based integration improves information exchange and decision-making, reducing delays and enhancing the passenger experience.
CAP#9 Enabling TBO Phase 3	Solution 1 Solution 4	Solution 4						Sol#1: Integrated management of single-engine and engine-off taxiing operations and develops the concept of tug fleet manager, which enable TBO Phase 3 for the future gate-to-gate automation. Sol#4: it enables TBO Phase 3 by contribution to the advanced calibration of airport capacity, reducing the uncertainty enabling more accurate prediction of ground operations.

The solutions' objectives contributing to these capabilities and specific R&I needs will be achieved through the development of the 4 solutions starting from Technology Readiness Level (TRL) 2, 3 or 4 up to TRL 6, ensuring validation in relevant operational environments. This will involve integration, testing and demonstration activities, moving from component-level to system-level performance in realistic aerodrome environment.

Solution 1 targets to validate the concept of the integrated management of sustainable taxiing at the airport at TRL 6. The solution includes several key technologies that will support the operational evolutions, including performance monitoring integration and Dynamic taxi tools that will start from TRL4 based on the existing development under the state of the art. The Tug fleet manager tool under the scope of the solution is more ambitious, starting from TRL2 and targeting TRL6 demonstrated in a relevant environment. The development of this solution will follow two phases, from TRL2 to TRL4 and then from TRL4 to TRL6. The work performed under AEON Exploratory research project will be evolved to a laboratory environment, which will then be brought to a prototype able to be validated in relevant airport environment. This solution also addresses specific R&I needs, such as the integrated management of single-engine and engine-off taxiing operations, as well as the coordination of non-autonomous engine-off taxiing through a tug fleet manager.

The technologies from **Solution 2** target TRL 6 as well but starting from an initial TRL 3 and 4. The ADS-B integrity monitoring for Surface Movement Awareness System (SMAS), NM integration tool, A-SMGCS with SMAS mode currently correspond to a maturity of TRL4, and while the SMAS core, cloud-based architecture for SMAS, video sensors as data source for A-SMGCS and Centralized SMAS for multiple airports to TRL 4. This solution also addresses specific R&I needs, such as enhanced, optimised, and safe runway delivery for arrivals and departures, by increasing the credibility of data used for runway planning, enabling SMAS accessibility through a cloud-ready architecture, and supporting degraded mode operations to ensure operational continuity during SMR outages or partial system failures; and Advanced calibration of airport capacity, through improved planning enabled by integration with Network Management.

The development of the **Solution 3** will be built on the current technologies available validated in laboratory environment at TRL4 in previous SESAR projects and will target TRL6 under the scope of NEURON project. The technologies are based on digital tower related environment, including visual tracking, ground trajectory Smoother, video weather detector, Enhanced Tracking System (ETS), including VP/HMI enhancements, aerodrome safety Nets' enhancements and video weather System for video weather presentation. The key element to evolve these techniques and bring them closer to the operational environment are air traffic controller (ATCO) loop simulations and the use of live video to reduce taxiing times, improve ground handling support and make outputs compatible with current systems. In this solution, the R&I needs addressed include enhanced, optimized, and safe runway delivery for arrivals and departures, supported by predictive surface management through real-time visual tracking of ground entities; advanced calibration of airport capacity, enabled by the detection of congestion and dynamic adaptation via structured tracking outputs; advanced detection of aerodrome safety related alerts through the combined use of different technologies, reducing the risk of collisions on runways and taxiways, for real-time displaying to operational actors (i.e. ATCO, APOC and airside personnel), and data exchange between TWR and En-Route and TMA platforms providing structured outputs compatible with AMAN/DMAN and AOP systems.

Solution 4 aims to validate the holistic Demand Capacity Balancing (DCB) tool at TRL6 for end-to-end airport processes (airside and terminal/landside), starting from TRL4 as the DCB in AOP context existing today, but with limited elements and focusing only on the impact of airside processes on airport capacity. The involvement of the Airports, Airspace Users (AUs) and/or Ground Handlers in the validation process will ensure the end-to-end feasibility of the proposed solution. The integration of NOP elements complementing the relevant information and predictions for airports also targets TRL6, evolving the consolidation/adaptation of the Network Manager Airport Corner tool suite and other available NM services, for clearer and enhanced situation awareness, usage and functionality. Among the R&I needs addressed are enhanced, optimised, safe runway delivery for arrivals and departures, and advanced calibration of airport capacity.

The successful operation of the Solutions' functionalities will be evaluated through multiple validation exercises, described in section 1.2.2.3 under the methodology description.

In terms of automation, as it is a key element in the modernization of ATM and one of the main pillars of the European ATM Master Plan (2025 Edition) and the SESAR3 program. The progressive adoption of automation levels improves the efficiency, safety, and sustainability of airport operations by enhancing human-machine collaboration and optimizing decision-making in complex and dynamic environments. According to the European ATM Master Plan, the automation levels are defined from Level 0 to 4. The following table summarizes the targeted automation levels for each solution across the key operational phases of perception, analysis, decision, and execution.

Table 2. Automation levels for each solution across the key operational phases of perception, analysis, decision and execution

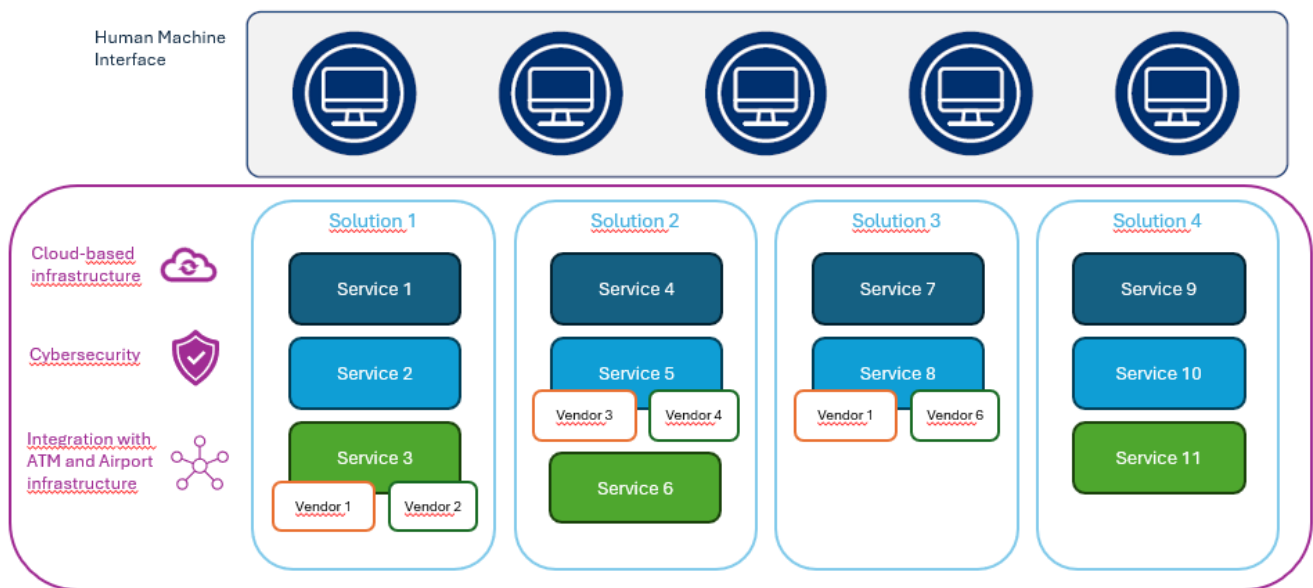
Automation Level\Phase	Solution 1	Solution 2	Solution 3	Solution 4
Perception	Level 4: Full automation independently acquires and shares information within a predefined scope.	Level 4: Automated acquisition and broadcast of cooperative surveillance.	Level 4: Multicategory detection and visual classification of dynamic objects (aircraft, vehicles, personnel, animals) using panoramic video feeds.	Level 4: Full automation acquires, consolidates, and exchanges real-time data between systems.
Analysis	Level 4: Automation performs full analysis of information and situation assessment autonomously within its defined limits.	Level 4: GNSS data and ADS-B quality evaluated, Safety alerts generated automatically.	Level 3: Filtering, ID persistence, and trajectory smoothing for consistent visual only or consolidated monitoring, via data fusion from multiple sources.	Level 4: AI for correlation, prediction, evaluation of confidence envelopes, and detection of deviations across airport processes, which matches full autonomous assessment.
Decision	Level 2: Automation proposes solutions, but the human operator	Level 2: Safety logic alerts ATCO, who	Level 2: Automatic weather and safety nets' alert classification	Level 2: The system generates tailored recommendations and alerts,

	validates or modifies the decision. Automation acts under direction.	validates or modifies decisions.	supports operational decision-making, with final decision validated by the human operator.	and proposes actions to the operator, ensuring that human intervention remains available for complex scenarios.
Execution	Level 3: Automation implements selected actions when appropriate, while the human operator supervises and can override if necessary.	Level 2: System performs autonomous alerts; human retains override.	Level 2: Visual labels and structured outputs integrated into HMI and systems, with human supervision and override.	Level 3: Validated actions and updates are automatically shared with relevant stakeholders and systems, ensuring that they receive timely and consistent information without operator intervention.

All the developed solutions are aligned with the **New Service Delivery Model** outlined in the European ATM Master Plan. This model promotes a layered and modular architecture that supports flexible, scalable, and service-oriented deployment of ATM functionalities.

The model builds on a clear separation between business, information and technical layers, supporting cloud-enabled services, cyber resilience and stakeholder-specific integration.

In line with this approach, each solution architecture will follow common design principles, including service decomposition, standardised interfaces and shared data models to ensure interoperability across stakeholders and legacy environments. Distributed service provision will be considered to strengthen operational resilience and enable graceful degradation. Cloud-native patterns will be applied where appropriate to improve scalability and elasticity. Finally, modular capability design will enable incremental upgrades, reducing the impact of change and accelerating the safe introduction of new services.



Solution 1 will use a hybrid Software-as-a-Service (SaaS) and Backend-as-a-Service (BaaS) model. The business layer defines stakeholder-specific goals, processes, functions, and organisational constraints. The information management layer ensures accurate, quality-controlled, and timely data exchange to support core services related to flights, airside flow, infrastructure status, and environmental information. The core layer delivers services for airside ATM, including capacity management, operational efficiency, traffic complexity, and sustainable taxi operations (e.g., A-CDM integration, tug fleet management, and dynamic taxi-time estimation).

SMAS under

Solution 2 will be evaluated as a modular, SOA-compatible component, that can be deployed via cloud/SaaS. The architecture allows local or centralized hosting, lightweight integration, and Seamless updates and monitoring. Its modular structure supports incremental implementation across different airport configurations and enables alignment with future digital services.

Solution 3 supports modular integration and structured outputs aligned with a service-oriented architecture (SOA). It can operate on cloud infrastructure and is designed to ensure cyber resilience through secure visual data pipelines. Its output format enables reuse across multiple applications and user interfaces. API exposure and registration in SWIM are planned to facilitate interoperability.

Solution 4 aligns with the new Service Delivery Model by delivering advanced AI-powered AOP tools that improve landside and airside planning with real-time data integration, arrival forecasting and airport resources optimisation.

Its modular, cloud-based architecture allows seamless integration into Airport Operations Centres (APOC/AOCC) environments. Core modules operate as plug-and-play services for scalable deployment across airports. Airport Planning Information (API) and data interfaces comply with SWIM standards (B2B services), enabling effective collaboration among stakeholders and supporting full NOP-AOP integration. The hyper vision service for airports will provide network information relevant for airport environment to enrich and adjust local airport planning.

1.2 Methodology

The delivery of the Digital European Sky by 2045 as targeted by the Master Plan is ambitious and requires a new way of working within SESAR, combined with changes to the regulatory framework to further shorten innovation cycles and time to market. The methodology proposed for the development of NEURON solutions is driven by agile thinking and structuring to be able to deliver the proposed products and services at the desired maturity TRL6.

NEURON proposes solutions aligned with the European ambitions for 2040, which require a methodology able to absorb and adapt to high changing rates, high complexity and risks. NEURON's service-oriented architecture and data-exchange mechanisms are aligned with ICAO's International Aviation Trust Framework (IATF), which provides the global model for trusted digital identity and secure information exchange. At European level, NEURON is also consistent with the European Aviation Common PKI (EACP) trust framework. The agile approach proposed for the development of NEURON solutions is Scrum. This section demonstrates how the development will be able to readapt according to the incremental evolution of the solutions and the feedback within short lifecycles to reach the desired outcomes.

1.2.1 NEURON targeted concepts and outcomes

1.2.1.1 Solution 1 - Integrated management of Sustainable Taxiing (STX) operations at the airport

This solution directly contributes to the SESAR WA 4 IR-4: "Future Airport Platform" objectives, with high relevance to the next generation airport platform, AI elements and reducing environmental impact. It supports the development of AI-based capabilities for automating movement area operations, enhancing data-sharing services, reducing environmental impact, optimising runway throughput, and promoting the deployment of smart, sustainable airport infrastructures.

The solution is structured around five core pillars:

- **Tug Fleet Manager Tool:** A decision-support system for real-time tug allocation and mission planning. It includes a digital coordination interface that connects the Tug Fleet Manager, tug drivers, and apron/ATC personnel (APNCO/ATCO), streamlining communication and operational efficiency.
- **Dynamic Taxi Tool:** A predictive engine that calculates taxi times based on taxi mode, traffic levels, and routing constraints. It enables real-time taxi route optimisation, ensuring efficient and conflict-free ground movements. It also integrates with D-MAN for accurate Target Take-Off Time (TTOT) and Estimated Taxi Out Time (EXOT) predictions.
- **A-SMGCS enhanced with STX Capabilities:** The four core SMGCS services to embed new features to support the Controller in managing STX operations. Enhancements include aircraft labelling based on taxi mode, intelligent alerting and automated generation of optimized taxi routes tailored to the aircraft's current STX mode constraints.
- **A-CDM with Performance Monitoring Integration:** A performance framework that incorporates environmental KPIs and operational metrics to enable performance-based decision-making. It includes automated triggers for selecting optimal taxi modes and strategies, based on live resource availability and operational status.
- **Simulation and Validation Results:** Validation of sustainable taxiing strategies, emissions reduction, and operational performance through real-time simulations and live trials, ensuring technological maturity and operational feasibility.

The implementation of the solution aligns with the new Service Delivery Model (SDM) by applying a hybrid Software-as-a-Service (SaaS) and Backend-as-a-Service (BaaS) architecture. The business layer defines stakeholder-specific objectives and operational roles; the information management layer ensures high-quality, timely, and accurate data exchange on flights, airside status, infrastructure, and environmental conditions; and the core layer provides services supporting airside ATM operations such as A-CDM integration, dynamic taxi-time calculation, and tug coordination.

1.2.1.2 Solution 2 - Cost-effective aerodrome traffic awareness integrated with AI-powered NM tools

Solution 2 proposes an enhanced SMAS (Surface Movement Awareness System) for delivering Surveillance and Safety Support services with additional features. Numerous airports, especially small and medium-sized ones, lack cost-effective and scalable surveillance systems to ensure situational awareness on the manoeuvring area, and full A-SMGCS systems are often economically infeasible for these cases.

Key challenges addressed by this solution include limited infrastructure availability (e.g. no SMR), GNSS vulnerability (produced by jamming and spoofing), and the need for scalable and low-maintenance solutions with

high automation potential. This supports the SESAR WA4 IR-4 “Future Airport Platform” by enhancing multiple innovation requirements, particularly in the areas of cyber-resilience, safety, surface management and support to automation. It is based on a modular SMAS architecture that ensures interoperability and scalability through cooperative surveillance. The solution evaluates sensor combinations for different airport types, detects and monitors GNSS and ADS-B quality using AI/ML tools. It also defines and validates fallback features and procedures to ensure continuity from full A-SMGCS to SMAS in degraded modes.

Additionally, SMAS safety can be extended by integrating various sensors (e.g. video, barriers) as an additional surveillance source for handling non-cooperative mobile objects. This contributes to increasing the automation level and resilience of surveillance solutions at airports.

Expected outcomes include a modular and interoperable architecture adaptable to various airport profiles, validated sensor combinations including video and barriers, real-time GNSS degradation detection with AI/ML tools, enhanced predictability and proven fallback procedures for degraded operations.

1.2.1.3 Solution 3 – AI-automated tracking for digital towers and aerodrome operations

This solution will focus on the development of an AI-based Visual Intelligence system integrated into a digital tower and airport platforms. This system combines four advanced modules that enhance situational awareness, surface management, and human-machine teaming in remote tower environments and aerodrome operations.

The core component is a Multicategory Visual Tracking module that detects, classifies, and tracks multiple object types in real time (i.e., aircraft, vehicles, personnel, wildlife), with persistent IDs and filtering capabilities. To improve usability and trust in visual tracking, the Ground Trajectory Smoother module ensures fluid and physically consistent motion of tracking labels on the panoramic HMI, eliminating erratic jumps. Additionally, the Video Weather Detector analyses panoramic video streams to automatically classify current weather conditions, supporting operational decision-making and replacing manual observation. Together, these components form a cohesive visual intelligence framework that strengthens digital tower capabilities and supports more automated, efficient and safe management of airport operations.

In addition to all previously described functionalities, Solution 3 will include a monitoring module aimed at displaying aerodrome safety related alerts. The module for aerodrome operations covers two safety functionalities, i.e., for runway and taxiways, using a mix of different technologies such as cameras, ADS-B, LIDARs and small radars to enhance situational awareness and safety performance. This, in combination with advanced AI-based technologies will enable the detection of Foreign Object Debris (FOD) and wildlife activity on runway, as well as taxiway incursions, thus improving aerodrome safety.

1.2.1.4 Solution 4 – Advanced AOP & Airport-Network Integration

This solution contributes to several key SESAR WA 4 IR-4: “Future Airport Platform”, particularly addressing most of the capabilities, including flight trajectory optimisation, surface management, capacity scalability, system connectivity, continuous optimization, machine-to-machine applications, and TBO Phase III. It supports the achievement of the expected outcomes for the deployment priorities of the next-generation airport platform, human – machine teaming and optimising runway throughput. Solution 4 aims at resolving issues and gaps identified within the AOP and Airport-Network integration context, focusing on two distinct areas, as follows:

- Within the current context of the Extended AOP, the DCB remains limited to airside/airspace operations, focusing on runway demand/capacity balancing and weather, as per SESAR Solution #21 and PJ.04-W2-29.1. The SESAR Deployment Programme 2022/2024 expands the AOP scope beyond airside, addressing landside and terminal processes impacting flight predictability and efficiency. Still, additional end-to-end DCB functionalities are needed to consolidate holistic airport processes across all key performance areas (i.e. aircraft, passenger and baggage).
- Airports, as nodes of the European ATM Network, both influence and are influenced by network performance. Network available information and predictions could improve local airport planning.

The objectives for Solution 4 are focused on the evolution of the Airport Operation Plan (AOP) functionalities & Airport-Network Integration, specifically comprising:

- Developing end-to-end Demand Capacity Balancing (DCB) functionalities for a more accurate planning and predictions within the Airport Operations Plan (AOP).
- Monitor the airport NM data exchange quality
- Integrating network pre-tactical and tactical information into a hyper vision service for airports, such as passenger demand prediction and regulation outlook which are currently available independently. As a result, airport resource planning, situational awareness, and overall predictability are improved, contributing to smoother, more resilient airport operations. In terms of resource planning on arrivals, the Solution includes the possibility to receive arrival information from airports outside the European region (such as Changi airport and JFK airport), to alert them in case of early or late long-haul arrival, with an impact on airport operations.

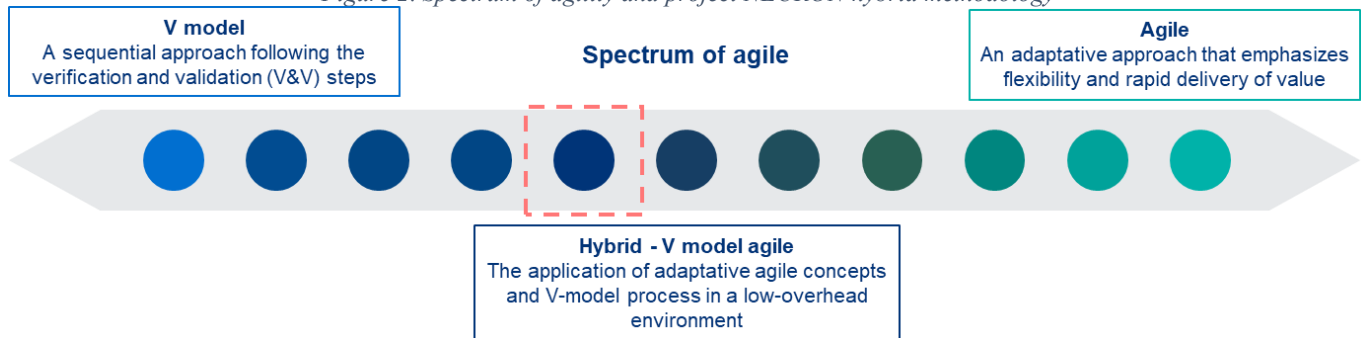
1.2.2 Solutions development and validation methodology overview

There is a wide spectrum of methodologies available to support the development and validation of airport platforms solutions, ranging from traditional, linear approaches such as the V-model to fully agile frameworks. These are not mutually exclusive, as many projects benefit from combining elements. The appropriate approach depends on several factors, including the solution's maturity, the complexity of stakeholder involvement and the need for adaptability over time.

Based on the experience with previous similar initiatives, maintaining some level of flexibility within a structured development framework is essential. As shown in Figure below, the methodology of NEURON will lean towards a V-model structure, incorporating agile-inspired features when needed, consisting of:

- **Duration of iterations:** Development will proceed in Sprints and structured cycles with intermediate deliverables.
- **Stakeholder involvement:** Stakeholders will be actively involved at key milestones to review progress and contribute to validation activities.
- **Adaptability to change:** While each phase is planned, the approach allows for controlled adaptation through Sprints, particularly at the start of the project to agree the scope of the Solutions.

Figure 2. Spectrum of agility and project NEURON hybrid methodology



The project follows a V-Model as the governing systems engineering and V&V framework. The proposed approach retains the advantages of a structured, milestone-driven lifecycle by applying the V-model methodology, a framework that has been successfully and extensively used in SESAR. This methodology, rooted in software development best practices, is characterized by a sequential execution of development stages, paired with parallel Verification and Validation (V&V) activities at each phase.

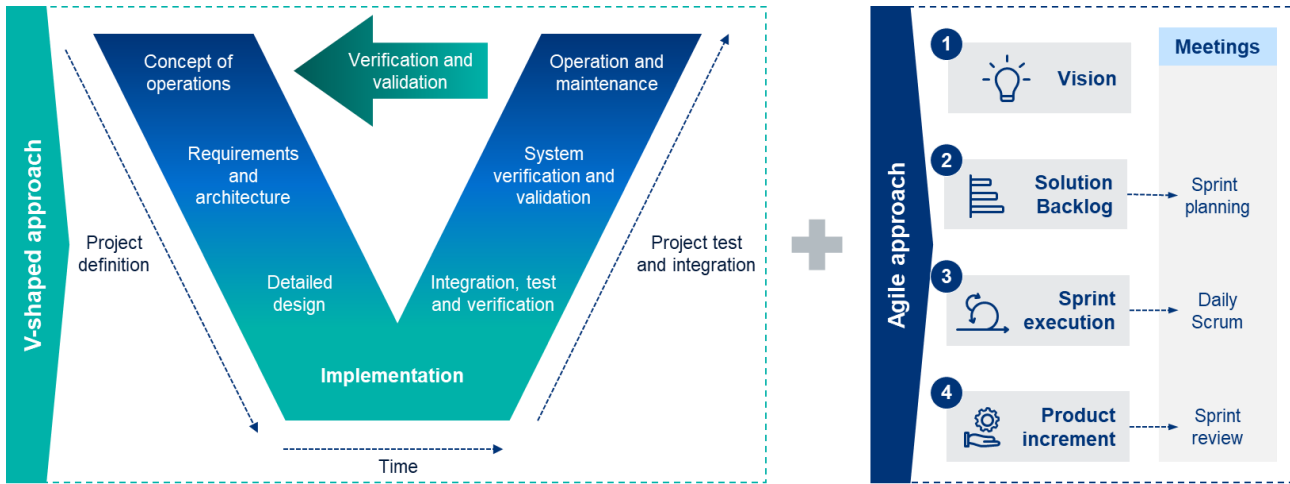
The V-Model is applied to the **concept definition**, **requirements definition**, and **detailed design**, and it also governs **validation** at system/operational level, ensuring end-to-end traceability and controlled baselining throughout the lifecycle.

Agile is used **only within the implementation stream**, i.e., for **implementation**, **integration**, **testing** and **verification** activities. In this context, Agile enables iterative and incremental delivery through short feedback loops, adaptive prioritization and regularly updated plans, aligned with Scrum principles.

In practice, operational partners contribute inputs (use cases, operational scenarios and refinements) that feed the V-Model artefacts (concept, requirements and design). Once these inputs are sufficiently mature and baselined, development teams decompose them into granular tasks executed in successive sprints. The resulting micro-functionalities are implemented, integrated and **verified** within the sprint cadence, preserving technical stability and traceability at the end of each iteration.

The increments produced through Agile are progressively integrated into consolidated solution versions and then assessed under the V-Model governance: **verification** confirms compliance with baselined requirements, while **validation** demonstrates fitness for the intended operational use through simulations, human-in-the-loop exercises, and live or shadow-mode trials. Each solution follows an implementation path adapted to its initial maturity, while integration and V&V remain coherent and controlled, supporting progression towards TRL6 by the end of the project

Figure 3. Development methodology based on V-shaped and agile approach



Solutions development will be subdivided into segments called sprints and the project develops from one sprint to another until the final solution is finished. Sprints are time periods of one month during which specific elements of solution must be completed. The project starts with the definition of each NEURON Solution, followed by the sprint cycles broken down into five different sprint processes (P) with different type of meetings (M):

- **P1: Vision.** The team comes up with a unified vision regarding the entire process and decides what will be delivered. Additionally, the team plans and agrees on what is necessary to successfully complete the cycle.
- **P2: Solution Backlog.** The Solution Backlog is a list of User Stories (US) that must be completed before the solution is released. It defines all necessary items to be covered by the team during the sprints.
- **M1: Sprint planning & Sprint review.** Meeting in which the team shows the main points of the work performed, identify the top priority actions and decides what will be delivered in the sprint.
- **P3: Sprint execution.** This part is the time frame in which the actual incremental work (decided in M1) must be completed.
- **M2: Daily Scrum.** Short daily meeting in which the team discusses completed tasks, work-in-progress tasks and any issues that are blocking the work.
- **P4: Solution increment.** The outcome of the sprint is a hypothetically usable product. The stakeholder can decide if the solution is ready or if additional features need to be implemented.

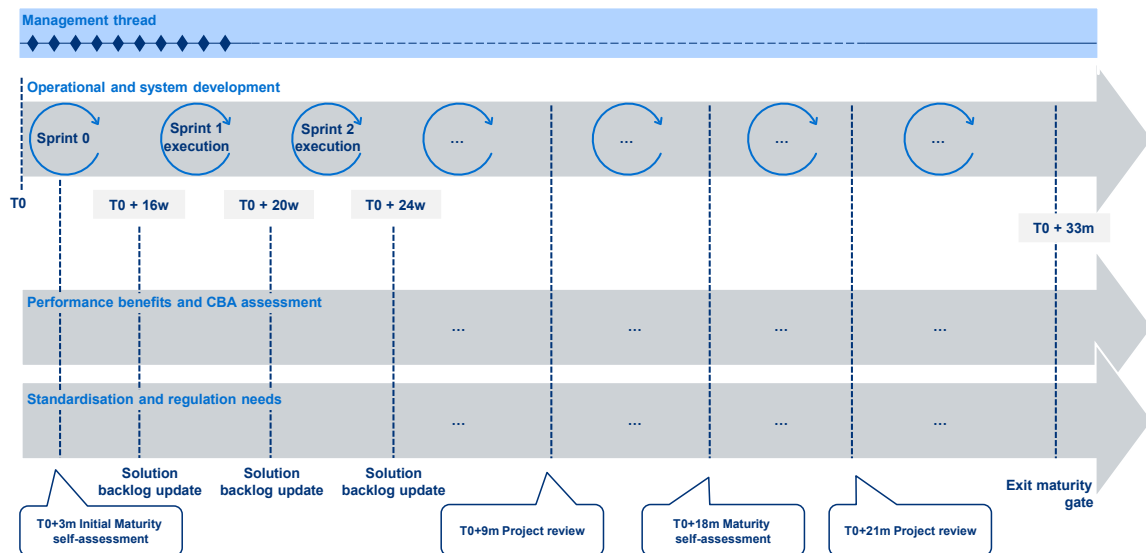
The steps from 1 to 4 are iterative and the project team will adapt to the evolution of the project, to the identified needs and the issues encountered. Agile methodology allows for flexibility and customisation of the solution as the project progresses. The Sprint duration proposed for NEURON solutions development is of 4 weeks, each solution following its own process and timings with the selected team.

The iterations for Solutions' development will be supported by the hybrid development methodology combining V-model structure and agile principles. Leveraging model-based validation and fast prototyping within each Sprint, the development will be driven by several threats supporting the required assessments and documentation for the elaboration of the Solutions deliverables..

During the duration of the project, management meetings will be held regularly to ensure the effective coordination across all stakeholders. These sessions will be focus on reviewing the project timeline through the Gantt chart, assessing progress against key milestones, and identifying any deviations or blocking points. The objective is to ensure timely delivery, facilitate decision-making, and maintain alignment throughout the project execution.

There are 3 threads of work throughout the duration of the project, combining the adapted agile methodology and the tasks defined for the Solutions development and assessment:

Figure 4 Threads of work for Solutions development and Sprints execution during the duration of the project



1. Operational and system development. Represents the core thread of the project and is driven by agile methodology and structured on Sprints. This thread combines the following tasks in each of the Solution Work Packages (WP03 to WP10) under the following tasks:

- Task 02. Development of the operational concept: It describes the new operating method of the proposed solution, identifying specific use cases, defining the needed enablers and specifying the operational, safety, performance and interoperability requirements. The results of this thread are reflected in the elaboration of the following document for each of the defined Solution: OSER (Operational Services and Environment Definition), divided into multiple parts: operational concept (Part I), safety assessment (Part II), human performance (Part III), environmental impact (Part IV), and performance analysis (Part V).
- Task 03. Development of the technical concept and specifications: It focuses on producing the Technical Specification (TS) and Interface Requirements Specification (IRS), detailing system functionalities, performance, and interoperability requirements to support implementation and integration of the solution.
- Task 04. Development of tools and prototypes: it involves designing and implementing the necessary software and hardware components, including the **Service Delivery Model** and a robust **Cybersecurity framework**, to ensure secure, scalable, and effective deployment of the solution.
- Task 06. Validations: It encompassed the full lifecycle of the validation process, from planning to reporting. The planning phase is structured into four parts: general concept (Part I), safety (Part II), human performance (Part III) and security (Part IV). The execution consists of the actual implementation of the validation exercises. Finally, the reporting covers the documentation and analysis of results, assessing the maturity, performance, and alignment with the plan and the objectives.

The definition and execution of these tasks are combined within this thread to prove that the Solution is operationally and technically feasible and deployable in the relevant operating environments, capable of delivering valuable/tangible performance benefits in line with the ambitions set out in the European ATM Master Plan. The expected solution outcomes are documented using the set of deliverables defined for each Solution exit maturity gate. These deliverables are prepared throughout the duration of the project and are adjusted to the evolution of the Solutions. The modelling and integration of the Solutions into SESAR architecture is done under Task 02, following the indications and guidelines of the optimised modelling and methods defined by the SESAR3 Transversal Project AMPLE3 in line with the maturity evolution and the Common Taxonomy elements.

2. Performance benefits and CBA assessment. Describes the performance areas that are expected to be impacted by each SESAR Solution under development and how this impact will be measured. Performance benefits are then monetised and analysed under the cost-benefit analysis (CBA), providing key measures on expected costs and benefits for key stakeholders. This thread is captured under:

- Task 02. Development of the operational concept for the elaboration of the Benefit Impact Mechanisms (BIMs) of each Solution under its correspondent OSER Part I, but also for the safety assessment (Part II), human performance (Part III), environmental impact (Part IV), and performance analysis (Part V).
DNSH (Do No Significant Harm) checks are embedded in OSER Part IV and CBA: each solution undergoes an Environmental Impact Assessment against the six objectives of the EU Taxonomy (Reg.

2020/852). The project does not significantly harm any objective; where trade-offs exist, mitigation is specified in the validation plans.

- Task 06. Validations for the identification of data to be collected during the validation exercises to demonstrate the contribution of the Solutions to the expected Key Performance Areas. Each of the performance reports under the OSED has a correspondent plan, as follows: safety assessment plan, human performance assessment plan and security assessment plan.
- Task 07. Cost Benefit Analysis is defined across all Solution Work Packages (WP03 to WP10), assessing investment needs, operational benefits, and environmental impacts to ensure the viability and scalability of each proposed solution.

3. Standardisation and regulation needs. Addresses the regulatory issues and considers the need for developing standards. Contact with the National Authorities and regulatory bodies will be done as required. This thread is captured under:

- Task 05. Standardisation and regulation are addressed across all Solution Work Packages (WP03 to WP10), ensuring alignment with relevant standards, regulatory frameworks, and contributions to SDOs where applicable.

The defined threads are closely linked and should not be seen as individual lines of work as the Solution backlog addressed within each Sprint will include elements necessary for each one of the threads. In particular, the performance assessment is a work thread that covers multiple Key Performance Areas (KPA) and impacts, aiming to contribute to the Capacity, Cost efficiency, Safety, Security, Environment, Human performance, Interoperability, Efficiency, Flexibility, Access & Equity and potentially to Passenger Experience. The assessment in each one of these areas counts with specific guidance material, designed by the Performance Transversal activity under PEARL Project team. The recommended methodologies and assessment approach for CBA, environment, safety and digitalisation and automation will be followed to ensure alignment with SESAR 3 framework and guidelines. In addition, the remaining KPA defined under the SESAR Performance Framework will be evaluated, including security and human factor, to evaluate if the solution has any impact and/or ensure there is no negative impact.

1.2.2.1 Sprint 0

The initial step into the project development will be represented by Sprint 0 that will focus on the Vision and each Solution's scope definition. The Solution team will define a unified vision regarding the entire development process and will build the initial Solution backlog. Figure 5 below presents the three tasks foreseen for Sprint 0 to prepare and kick-off the agile solution development. This Sprint will take approximately 16 weeks, but the following ones are planned to be monthly to maintain the flexibility and adaptability of the process.

Figure 5. Sprint 0 proposed tasks

Sprint 0 tasks



1. Solution concept definition. Will provide the overview of the targeted Solutions to be delivered at the end of the project and will be under the responsibility of the Solution owner as follows:

- Details the Solution to be developed and shares it with the contributors for refinement.
- Defines the expected impact of the solution and the KPAs/ KPIs (Key Performance Areas/ Indicators) it contributes to.
- Identifies the list of documentation to be prepared and the Solution maturity evolution.
- Assign agile methodology roles to the Solution Teams.

Agile methodology roles (i.e., Solution Leader and Development Team) are complemented by additional ones needed to complete the Solutions' assessments and evaluation to demonstrate the contribution and the maturity evolution during the duration of the project. The following aspects will be covered by:

- SESAR performance expert. Ensures the needed indicators for performance assessment and CBA are captured and measured within the Sprints. He/ she will be attending the Sprint review and planning meetings to indicate blocking points and actions that need to be taken at Solution and/or project level. Performance related discussions, indicators, data gathering and results collection required to evaluate Solutions' evolution and impact will be addresses in technical workshops planned and organised by the performance experts in collaboration with Task 02 and Task 04 contributors.
- Standardisation and regulation expert. Identifies if there is a need for standardisation and regulation consideration for the solution. He/ she will be attending the Sprint review and planning meetings to ensure the needs are detected in the early steps and that will be tackled in parallel to the development of the affected Solution.

2. **Solution backlog list and their linked priorities.** Will plan the tasks needed to achieve the development objectives for the Solutions definition and validation. The tasks will start to be executed in Sprint 1 with the start of development. The activities under this initial task include:
 - Bi-weekly meetings to review the solution backlog and address urgent issues.
 - Regular review and updating of the tasks list to track progress and outstanding items.
 - Identification of necessary technical workshops to cover specific topics and enhance team alignment including monitoring of risk and dependencies to proactively address potential blocking points.
 - Iterative prioritization to ensure focus on high-impact tasks and flexibility to adapt to new insights incorporating feedback and align expectations.

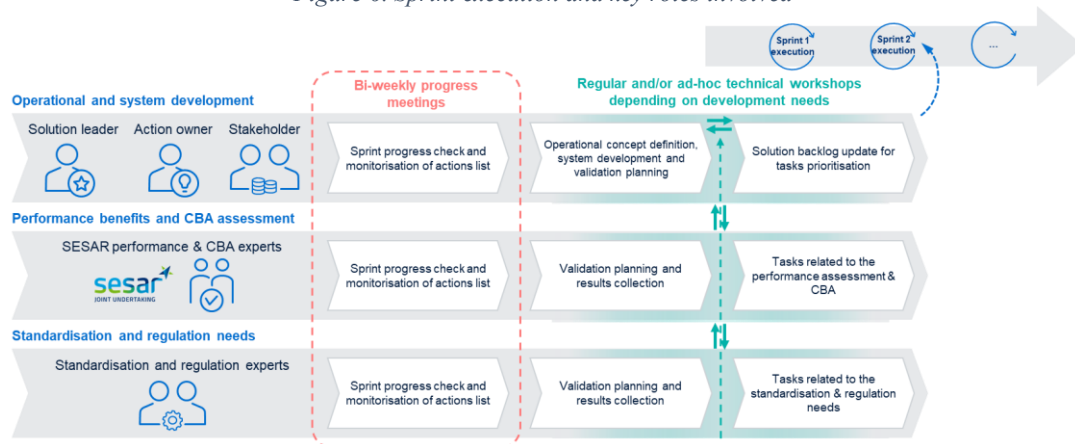
Agile Scrum elements and definition have been adapted to SESAR3 context, proposing the main elements needed to build the methodology for the NEURON solutions development. Each Solution will be guided by a list of tasks/actions able to describe the targeted outcome, the responsible, dependency and related deadline.

3. **Maturity evolution and metrics definition.** One of the advantages of following an agile approach for solution development is the possibility of solving problems in parallel to its development. The progress of the project is demonstrated through the solution maturity self-assessment, which is linked to a set of evidence and criteria fulfilment that will be presented on a yearly basis. Due to the iterative process and the dynamicity of the project, the maturity evolution and metrics definition needed for the document preparation should be identified and produced during the Sprints development. Therefore, this third task under Sprint 0 will include the following activities:
 - Performance/review of the initial maturity assessment.
 - Building of a dashboard (e.g., Excel or PowerBI) where the maturity criteria defined by SESAR 3 JU for Horizon Europe TRL¹ are defined and linked to the Solution backlog.
 - Definition of a list of indicators to support the performance and CBA assessment.
 - Establishment of the key elements that would cause standardisation and regulation needs.
 - Identification of the actions linked to the measurement of each of the defined indicators and metrics.

The output of the initial Sprint will settle the framework for the agile methodology to be rolling and will assign the necessary roles and responsibilities to ensure it will be sustainable and effective during the duration of the project.

1.2.2.2 Sprint 1 to n

Figure 6. Sprint execution and key roles involved



Sprints, except Sprint 0, are planned to have a duration of 4 weeks. Their focus will be to monitor and update the list of tasks/actions both at project and each solution level. Each sprint starts with the closure of the previous ones according to the weekday settled by all project members at the beginning of the project. Several roles are defined to build the suitable teams to develop the Solutions:

- **Solution leader.** Guides the development the solution, classifies the work, defines solution backlog and works with the teams on a monthly basis, providing solution feedback and setting the direction for the next piece of functionality that will be developed and delivered.
- **Action owner.** Ensures team coordination and supports the progress of the project between individual teams and all members. He/she takes the instruction defined by the Solution leader and ensures that the tasks are performed accordingly.
- **Experts.** Team members with all the skills needed to produce a specific function. There are multidisciplinary profiles, including system developers, designers, test specialists, operations experts and data analysts.
- **Stakeholders.** Project members interested in the development of the solution, such as final users, benefitted

¹ Annex E Maturity criteria of SESAR 3 JU MAWP 2022-2031

actors from the implementation or grant managers. This group provides feedback and insights on the solution definition.

The **Sprint execution** objective is to develop, test and deliver a set of prioritized tasks/actions from the Solution backlog. The evolution from one Sprint to another determines the actions needed to ensure the Solution's development increases and the direction goes towards the defined scope of the project. The meetings supporting the development of the Solutions and Sprint execution are the following:

- **Bi-weekly meetings – brief sessions focused on reviewing progress and identifying any blocking points.** These meetings provide a regular checkpoint to ensure timely resolution of issues and keep on track.
- **Technical workshops – regular and/or ad-hoc depending on the needs of the solutions development.** These workshops are organised to address specific topics requiring focused attention from experts and stakeholders. They may cover areas of specific threads, such as performance assessment, technical architecture, prototype implementation, standardisation and regulation, and validation planning. Their format and frequency will be adapted to the maturity and complexity of each Solution.

The Solution leader in collaboration with the stakeholders and supported by the Actions owners will review the work done in the last Sprint and so far within the project to refine the list of tasks, define new ones driven by the latest findings and update the Solution backlog.

The SESAR performance experts will identify the actions needed to ensure the list of Performance Indicators and metrics are identified, planned to be measures and finally measured and addressed for them to be able to evaluate the performance benefits provided by the Solution and build the corresponding performance assessments and provide the input to the CBA team for modelling.

Along the development and validation of the Solutions, standardisation and regulation aspects will be under the responsibility of dedicated task (Task 05. Standardisation and regulation), which will be in charge of identifying the need to engage with the National Authorities, EUROCAE and EASA (when required). Regulatory issues and the need for developing standards will be raised at the Sprint review, so that actions will be taken in due time and the necessary actors will be involved.

During the Sprint execution, the Solution Leader and the Project manager will ensure the outputs of the Sprints provide incremental delivery of the solutions and the requested evidence is captured in the specific documentation. As every increment brings together the elements from all threads, i.e., operational, system, performance and CBA and standardisation and regulation.

1.2.2.3 Solution maturity evolution and validation

According to the defined methodology, the Solutions development will be supported by the hybrid development methodology combining V-model structure and agile principles. The agile approach introduces new elements and ways of working allowing an iterative and incremental development and validation to deliver frequently and visualise evolution. Leveraging on the model-based validation and fast prototyping within each Sprint, the iterative process allows for the continuous refinement at two different levels:

- **Sprint level:** internal verification of the tasks completed within each Sprint and
- **Solution level:** self-maturity assessment at each annual technical review, targeting TRL6 at the maturity gate at the end of the project. The assessment of the maturity level during the execution of the project is adapted to ensure that relevant questions and checklists are used, namely the maturity criteria defined by SESAR3 JU under Annex E in MAWP for each TRL level.

Therefore, Validation exercises are a key element in demonstrating the feasibility and operational readiness of the designed prototypes. The past and current SESAR Solution development and maturity evolution depend on specific validation exercises aiming to demonstrate the maturity evolution. The incremental development of each solution is verified first within each Sprint and then through dedicated validation exercises. The exercises aim at demonstrating the feasibility of the solution from an operational perspective, the technical aspects being ensured throughout the Sprints, allowing maturity to be maintained, increased, or even reduced between cycles without issue, provided that causal factors and next steps are documented within the Solution backlog. Consequently, all solutions incorporate validation exercises to support this adaptive and robust development process.

The validation process is structured into several iterative validation exercises in order to ensure a controlled and progressive maturity increase of the NEURON solutions, while addressing the intrinsic complexity of a modular, service-oriented airport platform.

On one hand, a number of validation exercises follow an iterative maturation logic, where the same functionality is progressively validated at increasing levels of maturity. Early validation cycles focus on feasibility, functional correctness and operational suitability of core capabilities, while later iterations assess performance, integration readiness and operational benefits in more representative environments. This approach allows early detection of limitations, incorporation of feedback from operational stakeholders, and refinement of the solution before committing to large-scale or live validation activities.

On the other hand, several validation exercises are designed to assess specific components or services that will ultimately form part of the final integrated platform. In line with the Service Delivery Model, these components are validated as modular services, either independently or in partial integration, before being consolidated into a fully integrated solution. This enables targeted validation of critical enablers (e.g. prediction services, surveillance components, data exchange services or decision-support functions) while reducing integration risk and ensuring scalability and reuse across different operational contexts.

Breaking down the validation process into multiple iterations therefore ensures that validation activities remain aligned with the incremental development approach, supports traceability between requirements, implementation and evidence, and guarantees that final TRL-6 validations are performed on mature, representative and operationally coherent solution configurations. Solution 1 will be verified by means of one workshop and four validation exercises, aimed to bring Solution 1 technologies from an initial TRL 2 and 4 to a target TRL 6:

Validation Exercise Name	Target TRL	Involved Partners	Venue(s)	Objectives
WORKSHOP	2	DSNA, ENAC, EUROCONTROL, ADP, SNBV, NLR, INDRA, INDRA NAVIA, DLR, AIRBUS	-	Workshops to refine the Concept
EXE.SOL01.02	4	ENAC, ADP, DLR, AIRBUS, DSNA, EUROCONTROL, INDRA Navia	Toulouse	Real-Time Simulation with human-in-the-loop using prototype for Tug Fleet Manager Tool and A-SMGCS enhanced with STX Capabilities modules at CDG airport.
EXE.SOL01.03	6	SNBV; NLR, INDRA (support from KLM and LVNL)	Amsterdam	Real-Time ATM-Airside Simulation with human-in the-loop using industrial prototype at NLR-premises for Tug Fleet Manager Tool, Dynamic Taxi Tool and A-CDM with Performance Monitoring Integration modules at Schiphol Airport.
EXE.SOL01.04	6	EUROCONTROL, ADP, DLR, DSNA, INDRA Navia, INDRA, AIRBUS	Brétigny Sur Orge	Real-Time Simulation with human-in the-loop using prototype for Tug Fleet Manager Tool, A-SMGCS enhanced with STX Capabilities, Dynamic Taxi Tool and A-CDM with Performance Monitoring Integration modules at CDG airport
EXE.SOL.01.05	6	SNBV, INDRA and NLR (support from KLM and LVNL)	Schiphol	Live-trial / shadow-mode airside operations using the industrial prototypes for tug fleet management and taxi-time estimations (EXIT and EXOT) at Schiphol Airport

Solution 2 will be verified through seven validation exercises, targeting the maturation of several technologies. The following technologies will evolve from an initial TRL 4 to a target TRL 6: ADS-B integrity monitoring for SMAS, NM integration tool, and A-SMGCS with SMAS mode. Additionally, the following technologies starting at TRL 4 will also be validated up to a target TRL 6: SMAS core, Centralized and SOA-based architecture for SMAS, and Centralized SMAS system for multiple airports.

Validation Exercise Name	Target TRL	Involved Partners	Venue(s)	Objectives
EXE.SOL02.01	6	AP-Tech, EUROCONTROL, GDN, PANSA	Gdansk (GDN)	Compare ADS-B + MLAT and ADS-B + magnetic loop. Live trial/shadow mode trial.
EXE.SOL02.02	6	AP-Tech, EUROCONTROL, WRO, PANSA, DBL	Wroclaw (WRO)	ADS-B only SMAS baseline validation with NM integration. Live trial/shadow mode trial.
EXE.SOL02.03	6	AP-Tech, EUROCONTROL, WRO, GDN, PANSA, DBL	Wroclaw (WRO) and/or Gdansk (GDN) or another Polish Airport	Validate SOA-based SMAS cloud architecture + NM tool + GNSS/ADSB+ADS-B integrity monitoring. Live trial/shadow mode trial.

EXE.SOL02.04	6	DSNA, INDRA NAVIA, EUROCONTROL	Lyon (LYS) (or Marseille (MRS), Nice (NCE))	Validate SMAS mode for A-SMGCS losing non-cooperative sensors. Shadow mode trial.
EXE.SOL02.05	6	DSNA, INDRA NAVIA, EUROCONTROL	Small/Medium French Airports (e.g. Bordeaux (BOD), Paris (LBG))	Validate SOA and Centralized based Architecture for multiple SMAS airports. Shadow mode trial.
EXE.SOL02.06	6	ENAIER, EUROCONTROL	Simulation Platform in Madrid (MAD). Data from Spanish airport	ADS-B only SMAS baseline validation with ADS-B integrity monitoring. Simulation/Shadow Mode trial.
EXE.SOL02.07	6	AVINOR, INDRA NAVIA	Oslo Remote Tower working position, with RT airport to be defined (e.g., Bodø)	Shadow mode trial, SMAS enhanced by video sensors.

The successful operation of Solution 3 will be evaluated through three comprehensive validation exercises. These exercises aim to elevate key technologies from an initial TRL 4 to a final TRL 6.

Validation Exercise Name	Target TRL	Involved Partners	Venue(s)	Objectives
EXE.SOL03.01	6	INDRA, HUNGAROC TROL and INDRA NAVIA	HUNGAROC TROL (Budapest)	Live-trial validation (real cameras video) in an isolated environment of assess tracking, HMI label behaviour and weather detection.
EXE.SOL03.02	6	ENAV, TECHNO SKY, NEXT	ENAV (Brindisi or Perugia)	Assessment of VP/HMI and safety nets enhancements, video weather detection
EXE.SOL03.03	6	AIA, INDRA, MINSAIT	Athens International Airport	Enhancement of Aerodrome Safety: Shadow-mode validations of enhanced aerodrome safety functionalities, assessing improvements in the detection of FOD and wildlife in the runway environment, as well as taxiway incursion monitoring to reduce collision, risks using real operational scenarios and multiple data sources (i.e. cameras and other sensors) .

In Solution 4, two separate exercises will be conducted to bring the Advanced AOP Platform technology from TRL4 to TRL6:

Validation Exercise Name	Target TRL	Involved Partners	Venue(s)	Objectives
EXE.SOL04.01	6	AIA, INDRA, EUROCONTROL, GOLDAIR, DLR	Athens	Live and shadow-mode validations of global Demand-Capacity Balancing (DCB) functionalities at Athens International Airport
EXE.SOL04.02	6	EUROCONTROL, AP-Tech, ADP, SNBV, AIA, DLR	EUROCONTROL	EUROCONTROL hosts shadow mode validations in the centralized data hub, demonstrating end-to-end data sharing from network services to airport systems, assessing system performance and scalability, and confirming operational benefits for both automated and human users.

The progressive increase of the TRL towards TRL-6 target will be adapted according to the project's evolution and the results obtained throughout its implementation. Validation outcomes are recorded after each Sprint, as well as following specific operational validation tasks.

1.2.2.4 Artificial Intelligence techniques

NEURON Solutions leverage AI and will follow a rigorous and well-defined methodology for the development, validation, and assurance of algorithmic robustness. The Solutions apply supervised machine learning (ML), complemented where appropriate by **reinforcement learning (RL)** techniques, with lifecycle controls aligned to EASA Concept Paper: “Guidance for Level 1 & 2 ML applications”. The technical robustness will be ensured by:

- Data & Model Quality: curated/labelled datasets (historical/simulated), versioned pipelines, repeatable training/validation.

- Performance & Reproducibility: task appropriate metrics (e.g. F1 Score and mean Average Precision (mAP) for detection & classification; Mean Average Error/ Mean Absolute Percentage Error (MAE/MAPE) for regressions; Area Under the Curve/Receiver Operating Characteristic (AUC/ROC) where relevant), with acceptance thresholds defined in Table 3 (Section 2.1) and confidence intervals.
- Failure Handling: anomaly detection, rule-based guardrails, safe fallbacks to human control, and post event root cause analysis.
- Human Oversight & Explainability: human-in-the-loop for safety relevant actions; confidence scores and operator-oriented explanations in HMIs.
- Ethics & Safety: adherence to EU principles (transparency, non-discrimination, accountability) and aviation safety assurance.

Combining monitoring, human oversight, and continuous learning allows AI agent production systems to deliver consistent, high-quality outputs while maintaining resilience. Continuous learning is not performed autonomously by the AI during operations; instead, any model update or adaptation is strictly governed by human supervision. Learning activities are limited to offline or supervised environments, triggered by predefined criteria and based on curated and validated datasets. Model retraining, parameter updates, or policy revisions are subject to formal approval processes, verification against performance and safety thresholds, and traceability requirements before deployment. This human-in-the-loop approach ensures that operational behaviour remains predictable, compliant with safety and regulatory constraints, and aligned with operational intent, while still allowing the system to evolve in a controlled and auditable manner based on validated evidence and expert judgement.

1.2.3 Results from current research and innovation activities

Most of the international projects that are related and settled the foundations for the solutions proposed in this document are framed within the initiatives carried out by SESAR, especially those encompassed under projects SESAR1, SESAR 2020, and SESAR3, initiatives promoted by EUROCONTROL under other programs such as the EUROCONTROL Air Transport Innovation Network (EATIN) and other exploratory research initiatives (AEON and ASTAIR).

Solution 1 builds upon a solid foundation of previous SESAR research and validations that established the enablers for improving ground movement efficiency. In particular, SESAR 1 Solution #22 and #04 were especially important for more efficient airside planning and for improving situational awareness through enhanced visual tools for vehicle drivers. Subsequent developments including SESAR Solution #106, #53 and the PJ.02-08-01 contributed to better pre-departure sequencing and reduced runway occupancy times. In parallel PJ.02-W2-21.x series developed advanced support tools for ground handlers and vehicle operators, including datalink-based management and optimized route planning. PJ18-W2-53B further advanced ground trajectory prediction, enabling the future integration of automation tools. This baseline is complemented by results from exploratory projects such as the AEON project, which introduced environmentally optimized arrival and departure procedures, and the ASTAIR project focused on AI-based strategic trajectory allocation for improved predictability and efficiency. Furthermore, the solution incorporates insights from the FASTNet Solution 0346, which developed models and methodologies for the prediction of taxi times based on network-wide constraints and local airport parameters, supporting more accurate and sustainable taxiing operations.

Solution 2 builds on key SESAR 2020 results and dataset and EUROCONTROL SMAS specifications to ensure interoperability and compliance. It also builds on and aligns with the ongoing PEACOCK project (CEF-T-2023-SIMOBGEN call), which supports smart and interoperable mobility initiatives. Additionally, the ENVISION project under SESAR 2020 contributes with research on CCTV, and image processing technologies to enable cost-effective surface movement surveillance at regional airports. This solution leverages advances in AI-powered cooperative surveillance and modular system design to address GPS signal interference and enhance situational awareness.

Solution 3 builds upon key enablers and technological baselines developed in SESAR 2020 and S3JU, specifically the advancements delivered under PJ.05 “Remote Tower”, PJ.16 “Advanced ATC Tower Services” and JARVIS Airport Digital Assistant Solutions for aerodrome digital safety functionalities, including the use of AI technology capabilities for the detection of vehicle TWY incursion, FODs and wildlife activities the RWY environment. These projects matured the concept of Digital Remote Towers and introduced the Integrated Remote Tower Operations Suite (IRTOS), a modular, flexible platform enabling the provision of air traffic services to multiple airports from a single remote tower module, while further evolved the aerodrome safety functionalities. The validations carried out under these past projects demonstrated the feasibility of multiple remote tower operations as well as the integration of advanced functionalities such as automated safety nets, dynamic allocation of Aerodromes to Multiple Remote Tower Modules (MRTMs) and enhanced surveillance and human-machine interface (HMI) concepts. IRTOS plays a central role in enabling scalable remote tower operations by integrating surveillance data fusion, digital visual presentations, and advanced decision-support tools.

Solution 4 relies on SESAR 2020 results and datasets, particularly those related to Airport Operations Planning (AOP) and network synchronization, particularly leveraging the extension of FASTNet 0346 “AOP-to-AOP” and the Target Time of Arrival (TTA) management mechanisms defined in SESAR PJ.25-02 for integrating arrival flights originating from outside the European airspace. It also builds on the Demand Capacity Balancing (DCB) framework focused on airside and airspace operations, as outlined in SESAR Solution #21, JARVIS Airport Digital Assistant for turnaround and passenger predictions and PJ.04-W2-29.1, which balances runway demand and capacity while incorporating real-time weather data.

1.2.4 Inter-disciplinary elements within the proposed methodology

NEURON project integrates different techniques, tools and data from different fields as well as a multi-disciplinary team to develop the Solutions under the scope of this proposal. The inter-disciplinarity within the proposal is reflected through the participating partners, which include operational actors involved in air service provision, airport operators, airspace users, developers and key industry players. This brings together different perspectives that are combined to develop future data services and applications for airports and network. Furthermore, there will be an Advisory Board (AB) for NEURON that will assist in providing feedback and recommendations on the project results. ACI Europe, LVNL (Netherlands ANSP) and SAS (a global leader in taxibotting solutions) has already confirmed their participation under the AB, which remains open to new interested members.

In addition, agile methodology has been adopted and incorporated into SESAR industrial research to allow quick evolution of the solutions. System engineering is combined with the operational concept development to provide solutions that are feasible to be implemented into real environment in a fast-track approach. The proposed methodology structured on Sprints with iterative loops of activities and incremental deliveries allow the presence of inter-disciplinarity within the project and allows specific knowledge from the partners to be included in the development. Additional knowledge is brought into the project by profiles with wide expertise on performance assessment and CBA analysis, standardisation and regulatory aspects as well as validation exercises.

1.2.5 Role of social sciences & humanities

Social sciences and humanities focus on human life are not under the objective of this proposal. These disciplines are not integrated into the project as there are not relevant for the development of the targeted Solutions.

1.2.6 Gender dimension in R&I

The R&I content (automation, algorithms, systems integration) is sex/gender-neutral, as no sex/gender variables are expected to affect scientific outcomes. Nevertheless, NEURON will: (i) encourage balanced participation in user-in-the-loop activities where feasible; (ii) monitor and report gender-disaggregated participation (aggregated/anonymised) in validations; (iii) apply inclusive-by-design principles to HMI/training materials; and (iv) use unbiased recruitment procedures. No gender data beyond what is necessary for monitoring will be collected.

1.2.7 Open science practices

Research programmes, like Horizon Europe in the present case, promote openness, integrity and reproducibility in research to build a more open research environment and culture. NEURON project aims to contribute to the research community, particularly to aviation, in terms of airport operations and their integration into the network.

Therefore, the practices taken on-board by NEURON project are:

- **Open access to publications.** SESAR Solutions deliverables are published by S3JU on their website once available. The Grant agreement will identify the level of openness of each contract deliverable. Additional publications aimed for dissemination, exploitation and communication will be developed by the project team, which will be openly available both inside and outside SESAR community.
- **Research output management.** Data management has already been considered as part of the methodology under SESAR Delivery thread. Key elements in terms of structure and FAIR principles (Findable, Accessible, Interoperable, Reusable) are identified and presented in the next subsection that will be further elaborated and delivered to the S3JU under the Data Management Plan (DMP) 6 months after the initiation of the project. DMP is a living document, updated in line with project progress and adjusted according to the evolution of the Solutions.
- **Open access to data.** Data and project outputs are as open as possible as closed as necessary. Solutions’ developments are based on industry partners building prototypes and preparing products for deployment. The knowledge gained by the project members and the details of the systems and prototypes developed will have restricted access and will be confidential to the developer and its potential users/clients. The effort dedicated by the participating partners and industry players is recognised and valued by limiting the public access to the Solution development details, mainly for market confidentiality. However, the defined technical requirements will be public. Access to the progress evolution status, validation results and to performance impact will be accessible to the SESAR3 community during the project lifetime. This will be than openly accessible through the Solution deliverables on S3JU’s website.

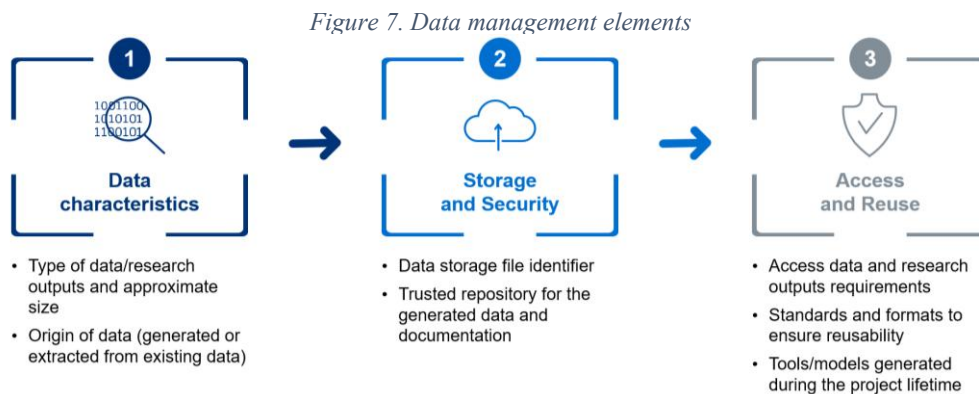
The project will generate validation results, benchmark datasets, architecture documentation, and test scenarios.

For example, in Solution 2, public outputs such as anonymized validation data, KPIs, and architecture summaries will be published under a CC BY-NC license via FAIR-compliant repositories like Zenodo. All proprietary data and software will remain internal, managed through private repositories (e.g., GitLab for AP-Tech).

The hybrid publishing venue in SESAR programme is the SESAR 3 JU website on one hand (www.sesarju.eu) and the S3JU portal (STELLAR). News and updates related to SESAR3 projects are shared by the SESAR 3 JU on their website, while the STELLAR Portal provides an integrated view of the European ATM System outlining the essential operational and technology changes foreseen to deliver the SESAR contributions to the Single European Sky performance objective. The pages represent trusted repositories used by the Solution projects.

1.2.8 Data management of other research outputs

The organisation, storage, preservation and sharing of data collected and used during lifetime of the project plays a key role in knowledge transfer and contribution to the community. It encompasses collecting, processing, governing, sharing and analysing data in an efficient, effective and reliable manner. The figure below shows the key elements considered by the project for data and project outputs management, in line with the FAIR principles (Findable, Accessible, Interoperable, Reusable).



1. Data characteristics. Types of data and research outputs that the project will use and generate.

- Information coming from SESAR2020 from the solutions related to the objectives of this project will be considered as input, mainly from the following SESAR2020 Projects: PJ.03b-01 (Safer Airport and Flights for Europe), PJ.02-08-01 (Trajectory based Integrated Runway Sequence), PJ.02-W2-21.1 (Extended Airport Safety Nets for Controllers at A-SMGCS Airports) PJ.02-W2-21.2 (Enhanced Guidance Assistance to Airport Vehicle Driver Combined with Routing), PJ.02-W2-21.3 (Management and Control of Vehicle Operations via Datalink), PJ.02-W2-21.6 (Surface Route Planning and Management operations), PJ05-W2-DTT (Digital Technologies for Tower), PJ18-W2-53B (Improved Ground Trajectory Predictions enabling future automation tools V3 Stream), PJ.04-W2-29.1 Airside/landside performance management and PJ.04-W2-29.3 (Environmental Performance Management), PJ.25-02 (Target Time of Arrival (TTA) management for seamless integration of out-of-area arrival flights, from SESAR3 projects: Solution #22, #04 #106 #53 and from SESAR3 FASTNet Solution 0346 and JARVIS Solution 0366.
- The existing data to be used by the project include airport operations and flight data, simulated and real flight plans, Manned and unmanned aircraft data base (BADA) and manned and unmanned aircraft flight performance. This information will be provided directly by the project partners. Network data will also be used, but this is usually available on EUROCONTROL website and dashboard.
- The solutions under the scope of the project imply systems development and prototyping, representing key outputs of the project with restricted access to it. These will be property of the developing company and are not included as deliveries of the project.
- Validation results will be extracted throughout the duration of the project after dedicated Validation exercises, complemented by the verifications done at each Sprint level. This will include excel files with specific data collected during the validation exercise, performance indicators measurements and maturity criteria evaluation.
- A set of deliverables are mandatory in the framework of SESAR3 programme, including each Solution deliverables presented in section 3.1 and the transversal PMP (Project Management Plan), DMP, (Data Management Plan), CDE (Communication, Dissemination and Exploitation) plan and annual project review supporting material. These represent the main output of the project as they collect and present the development performed throughout the project lifetime.

2. Storage and security. Repositories that will be used and access the Solution development content.

- The reference platform in the context of SESAR programme is SESAR Joint Undertaking website in

charge of sharing data and documents generated in the context of SESAR programme. This website also includes a restricted area (STELLAR - SESAR Tool Enabling coLLaborative ATM Research) for the project teams developing research projects and contributing to the European ATM vision. Each project has an assigned directory under S3JU website restricted area/portal. Dedicated folders are built for each project reflecting work packages and project structure. All generated files will follow a specific naming procedure: project name, solution code, deliverable ID or document name, version and date. The files are stored in the specific folder corresponding to the work package and activity it belongs to. Access to the restricted S3JU portal (STELLAR) will be granted to the contributing partners to the Solution it contributes to. The permission to viewing, editing and uploading content of the Solutions directory is decided by each project. Material to be shared within SESAR community, general access to Stellar portal, will also be identified by the Project manager in collaboration with S3JU.

- Performance and costing exercises generated for each of the Solutions under the scope of the project will be shared within SESAR 3 programme when required, such as with transversal working areas for the development of consolidated performance assessments report or in support to European ATM Master Plan campaigns.
- Solutions' development will follow SESAR 3 programme reference documentation and defined templates to ensure alignment of standards, formats and vocabularies for data and metadata.
- The quality of the material and documentation generated throughout the project lifetime will be ensured by the Data Manager. The content of each publication defined under the CDE plan, inside or outside SESAR 3 community will be firstly approved by the project members and only afterwards will be share by the Project Manager.

3. Access and reuse. Access to the project data and availability of tools and data for further use.

- The content will be reusable through access to STELLAR, which will be granted to the contributing partners of the Solution to which it contributes. Each project will determine permissions for viewing, editing, and uploading content within the Solutions directory. Materials intended for sharing within the SESAR community and general access to the STELLAR portal will be identified by the Project Manager in collaboration with S3JU.
- Performance and costing exercises generated for the Solution under the scope of the project will be shared within SESAR3 programme as required, such as with transversal working areas for the development of consolidated performance assessments report or in support to Master Plan campaigns.
- Solution's development will follow SESAR programme reference documentation and defined templates to ensure alignment of standards, formats and vocabularies for data and metadata.
- The quality of the material and documentation generated throughout the project lifetime will be ensured by the Data Manager. The content of each publication defined under the CDE plan, inside or outside SESAR3 community will be firstly approved by the project members and only afterwards will be shared by the Project Manager.
- Data and metadata used for this project will follow a standardised format, incorporating specific industry standards and established vocabularies as indicated by ICAO/EUROCONTROL to ensure consistency and compatibility across systems. Validation mechanisms will be implemented to maintain data integrity, enabling seamless interoperability and efficient information exchange among project partners and beyond.

Project outputs and data will be preserved and analysed exclusively for the purpose of the project and according to policies set up by those partners and the S3JU. The elements presented under this section will be further detailed in the DMP. This document defines the obligations, conditions and technical measures to be undertaken by the partners to guarantee confidentiality, security and proprietary rights on exchanged data. The DMP will be formulated at the beginning of the project and updated as necessary during the project lifetime.

1.3 State of the art

The evolution of airports into smarter, more automated, and sustainable environments demands technological solutions that go beyond the current state of the art. While previous developments, such as improved DMAN tools, digital towers and AOP-NOP integration have laid solid foundations, critical gaps remain in terms of full operational integration, automation and AI usage, system scalability and technological maturity. These limitations contribute to persistent inefficiencies, particularly regarding CO₂ emissions, fuel consumption, and operational safety. Moreover, it is essential to strengthen technological capabilities within the airport environment to achieve the Digital European Sky.

Previous SESAR and CEF-funded projects have established key technological enablers for airport operations, including cooperative and non-cooperative surface surveillance based on ADS-B, CCTV and LIDAR, supported by multisensor data fusion and AI-based processing. Initiatives such as ENVISION and PEACOCK have demonstrated interoperable data exchange, cost-effective surveillance solutions and modular system architectures, while Digital

Tower developments have matured high-definition visual systems, electronic flight strips and safety alerting functions. However, these advances remain partially fragmented, calling for a more integrated and scalable approach at airport level.

Within this framework, NEURON emerges as a key initiative to develop and integrate advanced technological solutions to shape the next generation of airport platforms. Based on a service-oriented, interoperable, and resilient architectural model, NEURON proposes innovative solutions that build upon previous SESAR achievements. Each solution is designed to solve specific operational challenges with the ambition of delivering measurable improvements in operational efficiency, safety, and sustainability, and to unlock the full potential of digital transformation at airports:

- **Integrated management of sustainable taxiing operations at the airport:** Prior to this initiative, several SESAR projects laid the foundation for improving ground movement efficiency. SESAR 1 Solutions #22 and #04, along with SESAR Solution #106 (DMAN) and its subsequent enhancements (SESAR #53, PJ.02-08-01), enabled better taxi routing and more accurate pre-departure sequencing. These solutions contributed to reducing runway holding times and optimizing taxi flows. Additionally, SESAR Solutions #56 and PJ.02-W2-21.2, 21.3, 21.6, and PJ.18-W2-53B have focused on supporting airside stakeholders, such as ground handlers and controllers, through enhanced visual guidance tools and improved vehicle routing. FASTNet solution 0346 was also a predecessor of this solution by contributing to better predictions of taxi times and leading to reduced delays, optimised ground and airspace capacity, higher network efficiency and overall improved end-to-end passenger experience.
Building on these foundations, NEURON focuses this solution on reducing fuel consumption and emissions by introducing a set of intelligent and adaptive taxi-out strategies and adapted tower system. These include operational procedures such as single-engine taxi, aircraft towing, and AI-driven dynamic taxiway usage. By improving departure sequencing and enhancing taxi time predictability, this solution contributes to a more sustainable and flexible ground operation environment and departure sequence efficiency.
- **Cost-effective aerodrome traffic awareness integrated with AI-powered NM tools:** This solution builds on datasets and outcomes from the SESAR 2020 programme and relies on related projects such as PEACOCK and ENVISION to develop a scalable and modular Surface Movement Area Surveillance (SMAS) software system. In addition, the solution builds on the outcomes of SESAR projects PJ.02-W2-17.1 (alternative sensors enabling operations in low-visibility conditions at secondary airports) and PJ.02-W2-17.3 (alerting controllers to potential conflicts at secondary airports). These projects demonstrated the potential of alternative sensors and safety nets to enhance situational awareness where traditional surveillance infrastructure is unavailable or unaffordable. The solution specifically targets small and medium-sized airports, where budget constraints often limit investment in advanced surveillance infrastructure. The proposed architecture is cost-efficient, modular, and ensures interoperability with existing airport systems and Network Manager (NM) tools powered by artificial intelligence. The solution addresses a critical operational gap: between 2021 and 2024, GPS signal interference events increased by 220%, severely affecting surveillance continuity and safety. By providing GNSS and ADS-B monitoring enabling reliable cooperative surveillance, the system enhances situational awareness in manoeuvring areas, reduces taxi-out delays, and minimizes unnecessary fuel burn. Its intelligent data handling and optimized IT infrastructure support both scalability and cost-efficiency, contributing to safer and more sustainable airport operations.
- **AI-automated tracking for digital towers and aerodrome operations:** Building on SESAR 2020 results and dataset, such as PJ05-W2-DTT Digital Technologies for Tower or ENVISION for research on CCTV, LIDAR, and image processing technologies to enable cost-effective surface movement surveillance at regional airports. This solution leverages advances in AI-powered cooperative surveillance and modular system design to address PS signal interference and enhance situational awareness, addressing the current limitations of remote tower operations that depend heavily on manual surveillance and operator input. It introduces an AI-powered visual intelligence system capable of detecting, classifying, and tracking aircraft, vehicles, and other objects in real time, using panoramic video data and implementing technologies into a digital platform for towers and airport.
 - In addition, the system improves surface management, enhances safety through automated anomaly and weather detection, and supports better human-machine collaboration. By providing accurate, real-time guidance of aircraft movements, it contributes to reduced taxi times, greater automation, and improved decision-making in digital tower environments. Building also on SESAR 3 results (JARVIS), it further enhances aerodrome safety by detecting potential taxiway incursions involving aircraft and vehicles and identifying the presence of FOD and wildlife on the runway, with higher accuracy, using different technologies, through AI-based solutions.
- **Advanced AOP & Airport-Network Integration:** This solution answers the existing gaps identified within the airport operations plan (AOP) and airport-network integration by enabling a more dynamic and coordinated management of airport capacity. In line with SESAR Solution #21 (AOP and its seamless integration with the

network operations plan (NOP)) and PJ.04-W2-29.1, the scope of the Demand and Capacity Balancing tool, currently limited to airside processes, will be extended to include end-to-end airport operations.

Currently, it is not feasible to integrate and consolidate the impacts of each standalone passenger and baggage processes' on-time departure punctuality and vice versa. The impact of queues in passenger and corresponding baggage processes has been evaluated in previous SESAR solutions, such as PJ.04-W2-29.1, but not reaching TRL6 maturity. Further, it is not yet possible to have a cascading view of which processes or elements contribute to a given (anticipated, occurred) bottleneck situation specifically. Drilling down the cascaded flow/KPA views to identify the individual processes or individuals' contribution is required to provide efficient mitigation.

Multiple elements of the AOP information are shared with the network to seamlessly integrate airports, but network available information that might impact the airport is not considered currently used by the AOP. This solution will integrate network pre-tactical and tactical information into a hyper vision service for airports, such as passenger demand prediction and regulation outlook which are currently available as standalone services. As a result, airport resource planning, situational awareness, and overall predictability are improved, contributing to smoother, more resilient airport operations.

Therefore, the Solutions proposed by NEURON will significantly improve airport sustainability, operational safety, passenger experience, and overall system resilience. By aligning with the call topic and the requested capabilities, NEURON paves the way for the future Digital European Sky.

2 Impact

NEURON delivers four TRL6 SESAR WA4.1 solutions that enable greener taxiing, cost-effective surface awareness, AI-assisted digital towers & aerodrome operations, and AOP-NOP synchronisation. The project's impact pathway is outcome-driven: validate in relevant environments, quantify performance -versus Table 4 KPAs, and prepare standardisation ready-evidence for uptake. Impacts are pursued during and beyond the grant via targeted validation exercises (Section 1.2.2.3) and the CDE plan (Section 0), focusing on measurable improvements in predictability, emissions, safety, and network integration.

2.1 Project's pathways towards impact

NEURON delivers a set of advanced operational solutions focused on improving the performance of surface and network operations in line with the objectives of SESAR Work Area 4 (IR-4). Each of the four Solutions contributes to addressing specific operational challenges – ranging from fuel-efficient taxiing and enhanced surveillance to remote tower services & aerodrome operations and integrated airport-network synchronisation.

Grounded in AI and automation, these solutions promote greater predictability, environmental performance, and network integration, supporting the broader evolution toward a Digital European Sky and contributing to key performance areas including environment, capacity, cost-efficiency, and safety.

The SESAR Performance Framework provides the basis for assessing how R&I activities contribute to the strategic objectives set in the European ATM Master Plan. It defines a structured set of Key Performance Areas (KPAs) which serve as reference dimensions to evaluate the operational and societal impact of new ATM solutions. The performance assessment follows a progressive approach: first, by validating each solution in operationally relevant environments; then, by evaluating the tangible benefits for directly impacted stakeholders; and finally, by mapping the expected contribution of these solutions to the EU-wide performance ambitions defined in the European ATM Master Plan. The project's direct impact to Key Performance Areas (KPAs) is detailed in Table 4.

These impacts are expected to benefit key stakeholder groups, as outlined in Table 3, by enabling more cost-efficient, flexible, and sustainable surface and network operations. To realise the full potential of NEURON's solutions, their integration as common practices across the European ATM network will be essential. Widespread adoption will ensure harmonised implementation and amplify performance improvements for all operational actors.

Table 3: Target group benefits from project NEURON

Stakeholder group	Benefit	Impact horizon (link to European ATM Master Plan Phases)
ANSPs and ATCOs	Enhanced surface and surveillance capabilities	Medium-term (Phase C)
	Improved planning and coordination with the Network via AOP-NOP integration	Long-term (Phase D)
	Reduced workload and improved task support	Medium-term (Phase C)
	Enhanced situational awareness	Medium-term (Phase C)
Regulators, policy makers and public authorities	Evidence base for regulatory evolution on digital towers, cloud-based surveillance, and AI-supported operations	Medium-term (Phase C)
	Contribution to decarbonisation and airport efficiency objectives	Medium-term (Phase C)
	Improved planning predictability and integration	Long-term (Phase D)

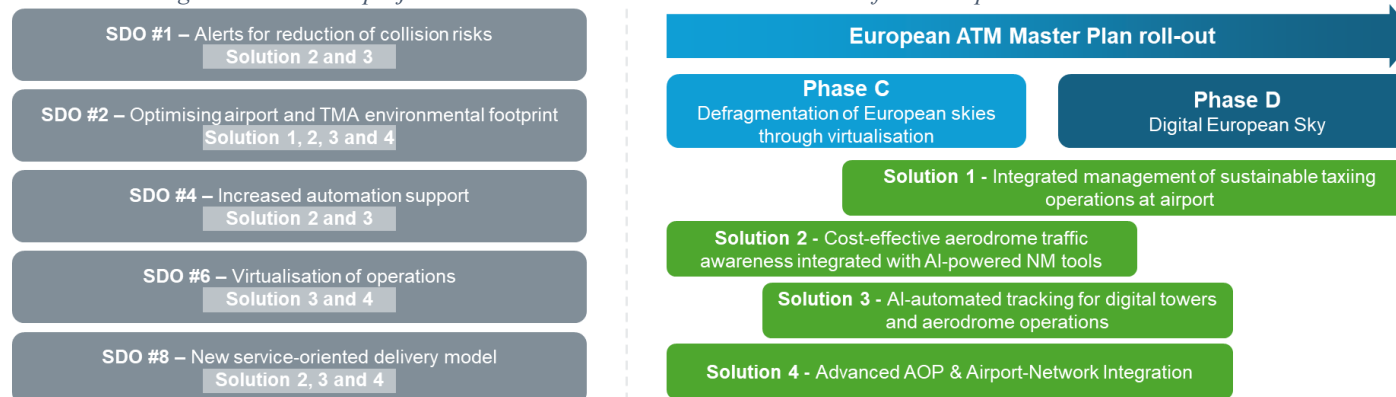
Military stakeholders and national security agents	Better data coordination and transparency via enhanced AOP interfaces	Long-term (Phase D)
Industry partners	New opportunities for commercialising AI-driven tools, digital tower components, and cloud-based surveillance	Long-term (Phase D)
	Early alignment with future deployment standards and performance-based service models	Long-term (Phase D and beyond)
Airlines and passengers	Reduced taxi times, emissions, and ground delays	Medium-term (Phase C)
	Improved flight predictability	Long-term (Phase D)
	Increased punctuality and smoother passenger experience	Long-term (Phase D)
Airports	Improved aerodrome safety and improved arrival and departure processes, with increased predictability of operations via coordinated AOP processes and network alignment	Medium-term (Phase C)
	Greater resilience and optimisation of departure and arrival flows	Long-term (Phase D)
Ground handlers	More predictable TTOT estimates, reducing idle time and improving sequencing	Medium-term (Phase C)
	Better coordination of pushback and towing through digital interfaces	Long-term (Phase D)

Table 4: NEURON solutions expected contribution to KPAs

Solution/ KPAs	Capacity	Cost Efficiency	Safety	Security	Environment	Human performance	Interoperabil ity	Efficiency	Flexibility	Access & Equity
Solution 1	A-SMGCS adapted to STX operations, the Dynamic Taxi Tool and AI-driven tug coordination improve taxiway throughput and optimise ground flow, enabling more aircraft movements.	The use of single-engine and engine-off taxiing reduces fuel consumption, while automated planning improves resource utilisation and operational predictability, leading to lower costs.	Implementing route guidance enhances separation between towing aircraft while minimising route conflicts and operational difficulties.	N/A	The implementation of engine-off and single-engine taxiing, along with optimised routing, directly reduces emissions on the ground.	The system reduces workload for ATCOs and apron managers by automating routine coordination tasks, improving decision-making through AI-driven support, and enabling more predictable operations.	The solution is designed for integration with A-CDM, AOP, D-MAN, A-SMGCS, and ASRU systems, enhancing operational coordination across airport systems through standardised interfaces.	The coordinated use of tugs, predictive taxi-time tools, and real-time updates leads to reduced delays and smoother traffic flow, improving gate-to-runway efficiency.	The system supports mixed taxiing modes and real-time adaptation to operational and environmental conditions (e.g. air quality thresholds), enhancing operational flexibility.	N/A
Solution 2	Enables basic and extended surveillance capabilities at small and medium airports, increasing their capacity to handle traffic with improved situational awareness.	Offers a lower-cost alternative to A-SMGCS, i.e. an enhanced SMAS with additional sensors support and NM integration	Enhances situational awareness through automated safety-nets and conflict alerting.	N/A	Improved surface flow and reduced taxi delays help lower ground emissions; cloud-based deployment reduces local infrastructure footprint.	Provides simplified HMI, automated alerts, and fallback functionality to reduce ATCO workload and support decision-making.	Designed using service-oriented architecture (SOA), enabling integration with AOP, NM tools, and potential alignment with SWIM standards.	Real-time milestone sharing and anomaly detection improve predictability and responsiveness in airport and network operations.	Modular system supports various airport sizes and operational contexts, with fallback features for degraded modes	Extends surveillance capabilities to underserved airports, promoting equitable access to advanced ATM services across the network.
Solution 3	Enables digital tower scalability and real-time tracking of surface movements, supporting traffic throughput at airports with limited physical	Reduces the need for on-site tower staffing and conventional surveillance equipment through automation	Enhances situational awareness through real-time object tracking, video-based weather detection, and	N/A	N/A	Reduces cognitive load and manual tasks for ATCOs, A-POC and airside personnel, through AI-	Generates structured outputs compatible with A-SMGCS, AMAN/DMA N, and AOP systems,	Provides real-time, automated data to support decision-making and surface flow optimisation, improving	Enables flexible remote tower configurations and supports operations at multiple airports with adaptable	Facilitates cost-effective tower and aerodrome services at smaller or remote airports, improving

Solution/ KPAs	Capacity	Cost Efficiency	Safety	Security	Environment	Human performance	Interoperabil ity	Efficiency	Flexibility	Access & Equity
	tower and aerodrome safety infrastructure.	and remote operations, lowering operational and technical costs over time.	safety net integration.			assisted tracking, smoother HMIs, and automated weather observation.	supporting integration into broader ATM environments.	overall safety and operational performance.	visual tracking modules.	access to advanced ATM capabilities across the network.
Solution 4	Improved and more accurate demand-capacity balancing (DCB) across landside and airside operations, enhancing real-time capacity management at airports.	Optimised planning and improved predictability reduce resource waste and operational inefficiencies, lowering airport and airline & ground handling costs.	N/A	The solution incorporates cybersecurity considerations by using SWIM-compatible protocols and secure data flows between systems.	Reduces emissions through better sequencing, reduced taxi times, and improved alignment of arrival and departure flows.	Provides decision-support tools, monitoring interfaces, and AI-based insights that reduce APOC workload and enhance operational awareness.	Designed for seamless integration between AOP and NOP, and with non-ECAC airports through NOP, enabling cross-border and cross-stakeholder coordination.	Designed for seamless integration between AOP and NOP, and with non-ECAC airports through NOP, enabling cross-border and cross-stakeholder coordination.	Enables responsive reconfiguration of plans and processes across airport stakeholders in response to demand fluctuations or disruptions.	N/A

Figure 8. NEURON project contribution to the SDOs and the Phases of the European ATM Master Plan 2025



NEURON project not only addresses immediate operational challenges at airports and in the network, but also supports the longer-term transformation towards a digital, scalable and environmentally efficient European ATM system. Through its four integrated solutions - ranging from sustainable taxiing and enhanced surveillance to AI-supported remote tower services, aerodrome operations, and airport-network integration - NEURON contributes to the SESAR Deployment Outlook and the realisation of the Digital European Sky vision. In particular, NEURON advances the deployment of modular, cloud-enabled and automation-driven capabilities at TRL6 that support the seamless integration of ground and air operations.

These contributions align with several Service Development Objectives (SDOs) defined in the European ATM Master Plan 2025, such as improving surface management, enabling trajectory-based operations, and advancing service-oriented delivery. By doing so, NEURON accelerates progress beyond SESAR Phase C into Phase D, reinforcing the operational and technological foundations for a high-performing, interconnected European ATM ecosystem.

The outcomes and impacts of NEURON go beyond its direct contributions to the Digital European Sky, generating broader benefits such as increased operational safety and efficiency, improved coordination among aviation stakeholders, and the acceleration of innovation across the European ATM and airport ecosystem.

Scientific:

- Advances the application of AI in airport operations, including trajectory prediction, visual tracking, and decision support systems, enhancing the reliability and explainability of automated tools.
- Strengthens research infrastructure by developing modular, service-oriented solutions deployable in cloud-based environments, supporting scalability and flexibility.
- Promotes interdisciplinary collaboration across aviation, data science, systems engineering, and human-machine interaction domains.

Economic and technological:

- Enables the development of innovative tools for sustainable ground operations, visual surveillance, and integrated airport-network planning, contributing to new service models and operational concepts.
- Improves the efficiency and predictability of airport and network operations, reducing delays and operational costs for ANSPs, airports, and airspace users.
- Supports standardisation efforts in areas such as airport performance monitoring, surveillance integration, and AOP-NOP synchronisation, reinforcing interoperability.
- Enhances the resilience of ATM infrastructure through AI-supported fallback procedures and improved situational awareness.

Societal:

- Contributes to CO₂ and local emission reductions by supporting engine-off taxiing, optimised surface flows, and accurate departure sequencing.
- Facilitates more predictable and inclusive access to airport capacity and shared infrastructure, improving the quality of service for passengers and operators.
- Strengthens trust and transparency in operational decisions through the integration of AI-supported monitoring, compliance tools, and collaborative interfaces.

The successful delivery of NEURON's expected impacts depends on key enabling conditions, including regulatory alignment, the uptake of digital standards, industry readiness for operational change, and the continued advancement of automation and cybersecurity frameworks.

Table 5. NEURON key barriers and mitigation strategy

Barrier	Type	Risk	Mitigation
Lack of harmonised frameworks for AI-based surveillance/decision support	Regulatory	Delayed approval and limited operational use	Early engagement with EASA/NSAs/EUROCAE; submit evidence packages; align with existing roadmaps
Integration of new solutions with complex legacy systems and heterogeneous upgrade cycles at large airports	Technical / Organisational	Slower deployment and increased costs due to coexistence of multiple platforms and stakeholders	Adopt open, service-oriented interfaces to ease integration; align deployment with airports' existing investment cycles; involve APOC, ANSPs, and handlers early to ensure interoperability and stakeholder buy-in
Absence of clear commercial models for remote tower or SMAS deployment in smaller airports	Market / Economic	Lack of business case; slow uptake by airport operators	Engage airport operators in validation; develop cost-benefit cases; liaise with SESAR Deployment Manager for deployment incentives
Uncertainty in policy and funding continuity beyond SESAR3 JU and Horizon Europe	Institutional / Strategic	Disruption in transition to deployment and industrialisation	Promote results to national funding bodies and SESAR Deployment Manager; document scalable transition plans in CDE and exploitation activities
Data availability, access, and confidentiality for training AI and predictive models	Data Governance	Limited datasets reduce algorithm performance and delay validation	Identify and secure data sources early; establish NDAs; create clean reference datasets; apply FAIR principles for open, non-sensitive data

2.1.1 Project's content towards impact

Supporting the industrialisation of its solutions requires close alignment with existing standards and active contribution to their ongoing development. This is key to ensuring seamless integration into the European ATM system and maximising the project's contribution to **Phase C** of the Digital European Sky, where the implementation of a **new service delivery model** is a strategic priority.

Each NEURON solution is linked to specific standardisation and regulatory frameworks overseen by bodies such as **EUROCAE, ICAO, EASA, and National Supervisory Authorities (NSAs)**. NEURON also contributes operational and technical evidence aligned with ICAO IATF pillars (trust, identity, security and interoperability) and is compatible with the European Aviation Common PKI (EACP) framework used in Europe for SWIM-related trust services. This ensures both global interoperability and regional compliance. While all solutions address technologies and concepts currently under development or refinement in the standardisation landscape, they differ in their levels of maturity. Some, such as **engine-off taxiing** or **airport-network integration**, build on existing guidance and infrastructure, enabling stepwise enhancements. Others, such as **AI-based visual tracking, GNSS integrity monitoring, or cloud-based surveillance architectures**, operate in areas where standards are still evolving and NEURON's validation activities can directly inform future regulatory and technical specifications.

Table 6: NEURON solutions' maturity and readiness for adoption

Solution	Relevant bodies documents and WGs	Key regulatory focus	Current status and challenges	Maturity Level
1. Solution 1	ICAO Doc 9971, EASA RMT.0734, EUROCONTROL AEON, SESAR PJ.02/PJ.34	Safe integration of tug-based taxiing, single-engine operations, A-CDM and A-SMGCS systems	Procedures for mixed-mode taxiing are not yet standardised; safety responsibilities between ATCOs, apron controllers, and ground handlers require clarification	Moderate – builds on operational concepts but lacks regulatory harmonisation
2. Solution 2	EUROCONTROL SMAS specification, EASA ATM/ANS regulations, EUROCAE WG-41, SESAR SMR/ADS-B guidance	Surveillance performance using cooperative surveillance supported by additional sensors, fallback procedures, and GNSS integrity	EASA ATM/ANS Reg. refers to EUROCONTROL and EUROCAE for A-SMGCS Certification. Both express performance requirements requiring SMR. From Operational perspective, there is no harmonized workaround system capabilities and procedure when SMR is missing. increasing GNSS interference raises resilience concerns	Moderate – technical concept mature, but regulatory support for fallback modes is limited
3. Solution 3	EUROCAE WG-100, EUROCAE ED-240, EUROCAE ED-235A, EUROCAE ED-274, EASA ATM/ANS rules, ICAO Doc 4444, SESAR Digital Tower validations	Visual surveillance performance, remote tower approval, human-machine teaming	AI-based visual systems not yet certifiable; explainability, liability, and ATCO & APOC/airside personnel trust are key barriers; HMI integration requires further guidance	Low to moderate – promising validation underway, but regulatory maturity for AI-based towers and aerodrome safety applications is low
4. Solution 4	EUROCONTROL NOP Manual, SESAR PJ.04/PJ.25, ICAO ASBU B2-ACDM, EUROCAE SWIM governance	Harmonised AOP–NOP data exchange, pre-tactical planning, SWIM compliance	AOP–NOP exchange remains uneven across the network; no unified standard for modelling and correlation of airport landside with airside processes; NOP-AOP depends on NM evolution	Moderate – aligns with SESAR guidance, but standardisation and implementation vary across stakeholders

To support the transition of NEURON Solutions toward industrialisation and mitigate the risks commonly encountered at **TRL 6**, the project adopts a targeted strategy focused on **regulatory readiness and alignment with standardisation processes**:

- **Active participation in standardisation bodies:** NEURON will engage with relevant working groups (e.g. EUROCONTROL, EUROCAE, ICAO, SESAR) to track the evolution of applicable standards and, where relevant, contribute validation evidence and technical insights from the project to shape emerging specifications.
- **Collaboration with regulators:** Close cooperation with **EASA** and National Supervisory Authorities will be pursued in areas where NEURON solutions introduce novel technologies—such as **AI-based decision support, automated visual tracking, and cloud-enabled surveillance**. This includes clarifying certification pathways and regulatory expectations related to safety, cyber resilience, and performance-based services.

- **Alignment with European and international frameworks:** The project will ensure that its technical developments and operational concepts remain consistent with **SESAR Deployment Frameworks**, the **European ATM Master Plan**, and ICAO provisions, facilitating future integration into the ATM system.
- **Support for result uptake and interpretation:** NEURON will promote knowledge transfer through participation in technical workshops, bilateral exchanges, and dissemination events involving industry stakeholders, standardisation organisations, and regulators. This will help ensure a shared understanding of solution maturity, implementation pathways, and enabling conditions.

Measures to maximise impact - Dissemination, exploitation and communication #The NEURON project adopts a proactive and structured approach to maximise its impact through a combined **Communication, Dissemination and Exploitation (CDE) Plan**, designed to promote project outcomes, engage stakeholders, and prepare exploitation pathways for validated SESAR Solutions. The plan will be coordinated with the **Data Management Plan (DMP)** to ensure alignment with FAIR principles, open science, and knowledge valorisation. The Consortium acknowledges the additional dissemination and exploitation obligations as set out under the call.

Further detail is provided in Section 3.1.

The strategic objectives of the CDE Plan are to:

- Promote awareness of NEURON's contribution to digital, automated and sustainable airport ground operations.
- Facilitate knowledge transfer and stakeholder uptake of validated SESAR Solutions (TRL6).
- Engage operational, industrial, regulatory and academic communities throughout the project lifecycle.
- Create favourable conditions for commercial, operational and policy-driven exploitation after project completion.

By leveraging the collective communication capacity of its partners, and building on past SESAR successes, NEURON aims to deliver both **scientific visibility and real-world adoption** of its outcomes.

In particular, the CDE activities will highlight NEURON's direct contribution to the advancement of SESAR innovation priorities and the Digital European Sky vision — notably in the domains of **sustainable taxiing, cost-efficient surveillance, AI-enabled remote towers, and airport-network collaborative integration**. The project builds upon previous SESAR achievements and validates concrete, solution-driven innovations across operational contexts.

Industrial partners and research organisations will actively contribute to the promotion and uptake of project results, ensuring alignment with SESAR principles and maximising downstream impact. The CDE Plan will also define preliminary **exploitation pathways** for key project outcomes — including **AI-supported tug coordination, modular surveillance platforms, and AOP-NOP integration modules** — with expected value for ANSPs, airport operators, industry stakeholders and regulators across Europe.

2.1.2 Communication strategy and activities

The success and long-term impact of the NEURON project will be largely driven by a strategic, well-targeted communication approach tailored to each key stakeholder group. The specific communication objectives for NEURON are as follows:

- CO1.** Ensure full consistency with SESAR JU's messaging and visual identity across all communication materials.
- CO2.** Raise awareness among aviation professionals and the general public of NEURON's role in enabling smarter, greener, and more connected airport and network operations.
- CO3.** Promote the value of AI-driven ground operations and enhanced airport-network coordination to both operational and non-operational stakeholders.
- CO4.** Build and sustain societal trust and professional confidence in digital and automation-based solutions.
- CO5.** Ensure long-term visibility of project activities and societal relevance, through accessible communication outputs that remain available beyond the project duration.

2.1.2.1 Coordination with SESAR Joint Undertaking (SESAR JU)

NEURON will align all CDE actions with SESAR JU guidelines (branding, messaging, acknowledgements) via a CDE Lead (INDRA) as single point of contact. A light pre-publication check will verify funding notice, visual identity and message alignment. We will leverage SESAR channels (website, newsletter, social, joint booths) and synchronise visibility at key milestones (Innovation Days, Annual Conference), ensuring maximum reach and coherence across the SESAR portfolio.

2.1.3 Dissemination measures

Dissemination in NEURON is designed not only as a compliance measure, but it also aims to ensure that **validated technical results, lessons learned, and best practices** are made publicly available **free of charge**, in a format accessible and relevant to each stakeholder group. The overall purpose is to **maximise the adoption, reuse, and regulatory recognition** of the project outcomes by those who can benefit most—be it to **operate, deploy, regulate, research, or industrialise** the solutions developed.

NEURON's dissemination strategy pursues the following specific objectives:

- DO1.** Foster operational uptake: Promote NEURON's technological enablers and ATM solutions to ANSPs, airports, and operational stakeholders, ensuring that results are packaged in a usable, actionable form.
- DO2.** Support industrial uptake and commercial pathways. Facilitate the transfer of results to OEMs and technology providers to inform future product development, industrialisation, and innovation roadmaps.
- DO3.** Inform regulatory and standardisation bodies. Provide evidence-based outputs (e.g. performance data, safety considerations, interoperability insights) to support harmonised regulation and standards, and contribute to ongoing updates of the European ATM Master Plan.
- DO4.** Encourage academic research and methodological advancement. Share open-access documentation, datasets, and scientific publications with the academic and R&I community, supporting further innovation aligned with SESAR priorities.
- DO5.** Engage dual-use and security stakeholders. Ensure early alignment with military and national security stakeholders, particularly around interoperability, secure integration, and dual-use application of NEURON's platform.
- DO6.** Ensure visibility and knowledge legacy beyond project end. Secure long-term access to public results through recognised European repositories (e.g., Zenodo, SESAR Library) and dissemination platforms (e.g., Horizon Results Platform, CORDIS, Open Research Europe).

Each dissemination objective will be addressed using tailored tools and partner-specific actions, which will be defined and formalised in the **CDE Plan** and updated during the Project.

2.1.4 Target Audiences for Communication & Dissemination

NEURON addresses a broad range of stakeholders that play complementary roles across the communication and dissemination landscape. While **communication** seeks to **raise awareness, build trust, and make the project visible to the public and media**, **dissemination** focuses on **transferring knowledge and results** to those who can further develop, apply, or regulate them.

The table below outlines how NEURON differentiates and aligns its strategy for each audience type.

Audience Segment	Information Need	Communication Objective	Dissemination Objective
General Public	Awareness of sustainable, AI-enabled ATM benefits	Plain language; videos/infographics	Not a core D target; via Open Days & media
ATCOs / ANSPs / Airport Operators	How solutions integrate in ops & reduce workload	Pragmatic tone; demos; user testimonials	Ops guidelines, best practices, validation results
Policy Makers & Regulators (EASA, NSAs)	EU alignment; evidence for policy/funding	Policy briefings; regulatory summaries	Safety cases; inputs to regulation/standard updates
Military & Security Stakeholders	Early view on security & interoperability	Confidential briefings; scenario sessions	Secure alignment on dual-use/defence needs
Standardisation Bodies (EUROCAE, ICAO, etc.)	Evidence to support future ATM standards	Institutional positioning via SESAR	Technical deliverables; WG proposals/feedback
Industry Stakeholders / OEMs	Inputs for investment & product roadmaps	Commercial pitches; factsheets	Performance data; tech-transfer sessions; exploitation planning
Academia & Research Institutions	Reusable findings & data	OA publications; conferences	Datasets; methods; peer-reviewed papers; networking
Media & Press	Amplify milestones & societal relevance	Stories; press releases; interviews; KPIs	Indirect D channel (supports visibility, not technical reuse)

2.1.4.1 Communication and Dissemination Channels and Tools

NEURON adopts a coordinated and complementary approach to communication and dissemination, recognising that **different stakeholder groups engage through different formats**. Some channels are designed to raise awareness and visibility (*communication* - C), while others aim to transfer technical knowledge and promote uptake (*dissemination* - D). Several tools are explicitly designed as **dual-purpose actions**, serving both functions depending on the content and timing.

The Consortium acknowledges the additional dissemination and exploitation obligations as set out under the call.

The table below summarises the planned channels and tools, aligned to the project timeline and classified by function:

Table 7 Dissemination & Communication Channels & Tools

Phases	Channel & Tools	Timing/Frequency	KPIs & Target	Type (C;D)	Target audience
Phase 1 – Initial Setup (M0–M3)	NEURON project Webpage (SESAR JU portal)	Launch M2, monthly updates	≥ 1,500 visits/year	C,D	All stakeholders
	Visual Identity Toolkit: A coherent branding package to ensure consistency across all communications.	M2	Toolkit in use by all partners	C	All stakeholders

	Social Media Plan (LinkedIn)	6-8 posts/month	≥ 1,000 followers ≥ 250 posts	C	General public, media, institutional followers
Phase 2 – Active Engagement and Visibility (M4–M24)	Electronic Newsletters: updates on project milestones, validation results, and stakeholder engagement activities.	Quarterly	≥ 4 newsletters/year	C	Industry, ANSPs, EU institutions, SESAR JU
	Participation in Sector Events: Presence in key industry conferences such as Airspace World, SESAR Innovation Days, and ECATS Conference.	During the project	≥ 4 events, ≥ 4-6 partner presentations	C,D	Industry stakeholders, policy makers, R&I
	Joint Press Releases with SESAR JU: Designed to amplify project milestones and achievements across European media	Released around major technical or strategic deliverables.	≥ 3 press releases	C	General public, EU media, policymakers
	Infographics and Explainer Videos: engaging and accessible formats for broader audiences.	Around M30.	4 short videos and 4 infographics (at least 1 per solution)	C	Public, ANSPs, policy makers, media
	Conference Papers & Posters: Presentation of technical results at scientific and industry events.	During the project	≥ 4 contributions	D	Scientific and academic community
	Peer-reviewed Publications: Scientific articles detailing methods and findings in open-access journals.	From M18 onwards	≥ 3 open-access papers	D	Researchers, academia, scientific community
Phase 3 – Consolidation and Legacy (M25–M30)	Final White Paper and Technical Publications: A structured summary of project results, policy recommendations, and deployment roadmap.	M36	1 white paper	D	Regulators, policy makers, EU ATM community
	Open Days and Demo Days (On-site and Streaming): Organised around validation milestones to showcase prototypes, user feedback, lessons learned, and performance indicators to a broad range of stakeholders. These will include live demonstrations and hybrid participation formats.	At the end of the project	4 events (≥ 1 per solution), ≥ 150 participants total	C,D	Airport operators, ANSPs, regulators, media, all partners, SESAR JU, cross-sector stakeholders
	FAIR Repository Uploads (SESAR Library): All public deliverables and additional outputs (e.g. datasets, source code, documentation, models) will be uploaded to ensure long-term accessibility.	M36	100 % of public deliverables uploaded and accessible (check number of public deliverables) + other relevant assets uploaded	D	Researchers, developers, policy stakeholders
	Horizon Results Platform & Innovation Radar	M36	1 Horizon Results profile · 1 Innovation Radar entry	D	Industry, investors, EC innovation services

2.1.5 Exploitation Pathways

NEURON delivers four validated solutions at TRL6, each addressing a specific operational and technological gap in airport and network operations. The exploitable outcomes are not limited to software components or technical tools but also include validated methods, reference architectures, datasets, performance frameworks, and integration models. Key exploitable outcomes include:

Solution	Key Exploitable Results	Target Stakeholders
Solution 1	• Tug Fleet Manager (decision-support) with digital coordination interface (Tug FM–drivers–APNCO/ATCO) and real-time mission allocation; integrated	Airports/APOCs, ground handlers &

	- environmental/operational/resource data. - Dynamic Taxi Tool (taxi-time prediction by mode/traffic/routing) with real-time route optimisation and D-MAN integration for TTOT/EXOT - Performance framework incl. environmental KPIs and performance-based triggers for taxi mode/strategy selection. - Validation evidence package (HITL + live trial) and integration patterns for A-CDM/AOP/D-MAN.	tug OEMs, ANSPs, system integrators
Solution 2	- SMAS core (cooperative surveillance) with ADS-B integrity monitoring and GNSS degradation detection; real-time notifications to controllers. - Cloud/SOA architecture incl. centralised multi-airport SMAS and operational procedures for deployment and maintenance. - Fallback from A-SMGCS → SMAS in degraded sensor conditions (procedures + technical mode). - Interoperability with NM/ECRA (milestone sharing, predictability support) and sensor configuration comparative results (ADS-B/MLAT/video as applicable).	Regional/medium airports, surveillance OEMs, Network Manager
Solution 3	- Multicategory Visual Tracking (persistent IDs, filtering), Ground Trajectory Smoother (stable labels/HMI usability), Video Weather Detector (fog/rain/etc.) and Aerodrome Safety Alerts' Detector. - ETS/VP/HMI and safety-net enhancements integrated in DTWR; structured outputs compatible with A-SMGCS/AMAN/DMAN/AOP; dataset packages for training/benchmarking. - Aerodrome safety module: detection of FOD, wildlife on runway and taxiway incursions by non-cooperative vehicles. - Validation evidence (ATCO-in-the-loop, live video, realistic traffic scenarios).	Digitaltower providers, Aerodrome Safety vendors, ANSPs, airports adopting RTWR/DTWR and Aerodrome Safety functionalities
Solution 4	- Advanced AOP platform (enhanced content, reception/distribution interfaces, storage, accessibility) with end-to-end DCB across landside/airside. - AI prediction services: Flight (e.g. ELDT/PLDT/ALDT, etc), PAX Process, BAG Process; AOP-NOP improvements including pre-connection checks and post-connection real-time monitoring. - QUANT (quality assessment of network transmission), NM HyperVision, and Centralized Data Hub (NM B2B/ECRA), plus APOC dashboards and human-in-the-loop oversight tools. - Operational benefits: improved predictability & sequencing; lower integration cost via single connection; scalable SWIM/SOA deployment.	Airports/APOCs, Network Manager, airlines, AOP/CDM vendors

2.1.5.1 Exploitation Typology

NEURON envisions exploitation as a multi-layered process spanning **technical maturation, operational integration, and regulatory/standardisation uptake**. Three complementary domains structure the pathway to impact, with clear roles for consortium actors and targeted downstream stakeholders.

- Industrial and Commercial Exploitation:** INDRA (incl. INDRA Soluciones), AP-Tech, INDRA NAVIA, ENAV/Techno Sky, PILDO, NEXT and AIRBUS will productise validated modules to TRL7+ (S1 Tug FM & Dynamic Taxi; S2 SMAS core/cloud/fallback; S3 DTWR visual intelligence; S4 Advanced AOP with predictors/QUANT/NM connectors). Modular toolkits for hub/regional airports (incl. cloud). PPP pilots explored under SESAR Deployment/CEF2/national programmes.
- Operational Adoption;** Airports (AIA, ADP, CPH, SNBV, GDN, PLW, AVINOR) and ANSPs (ENAI/CRIDA, DSN, ENAV, HUNGAROCNTR, LFV, PANSA) plus GOLDAIR will run shadow/HITL integrations, update A-CDM/AOP/DTWR roadmaps, and return performance/user feedback to NM (ECRA/NMVP) for network-scale uptake.
- Regulatory and Standardisation Uptake:** Evidence packages (safety, HP, KPIs, AI performance) will feed policy/standardisation dialogues via EUROCAE/EASA/ICAO/EUROCONTROL (see Section 2.1)

2.1.6 IPR & Open Science Measures

Results ownership follows the Consortium Agreement (DESCA). Partners own what they generate; protection (copyright, trade secrets, patents) will be case-by-case, with a patentability/licensing gate at M24. Public outputs are Open Access and FAIR (Zenodo/SESAR Library/ORE). Detailed research-data handling is in the DMP (D1.2 M6, updates at M18 & M33), already described in Section 1.2.7

Asset type	Access regime	Licence/measure
Publications, validation summaries, KPIs	Open Access	CC-BY / CC-BY-NC; DOI via Zenodo/SESAR
Non-critical code/models (when shared)	Selective Open	Apache-2.0 / MIT (case-by-case)
Safety-critical software/modules	Proprietary	Retained by generating partner
Patent-amenable algorithms	Under review (M24)	Go/No-go to protect vs. publish
Reference architectures/interfaces	Open under conditions	Shared for interoperability/standardisation

2.2 Summary

KEY ELEMENT OF THE IMPACT SECTION

SPECIFIC NEEDS	EXPECTED RESULTS	D & E & C MEASURES
<i>What are the specific needs that triggered this project?</i> • Low automation and fragmented interoperability on the airport surface; manual/inefficient workflows. • Lack of affordable surveillance for small/medium airports; resilience gaps (e.g., GNSS interference). • Insufficient AI support for digital/remote tower and aerodrome operations. • Incomplete AOP–NOP coordination and data quality assurance, limiting predictability and DCB.	<i>What do you expect to generate by the end of the project?</i> Four validated solutions at TRL6 with evidence packages (safety, HP, performance): • S1: Tug Fleet Manager + Dynamic Taxi Tool (sustainable taxiing, D-MAN/TTOT/EXOT integration). • S2: enhanced SMAS (cooperative surveillance) with cloud/SOA deployment, additional sensors support, GNSS integrity monitoring, NM/ECRA integration and ASMGCS fallback. • S3: AI visual intelligence for DTWR (multicategory tracking, Ground Trajectory Smoother, Video Weather) and aerodrome safety net enhancements. • S4: Advanced AOP (end to end DCB; Flight/PAX/BAG predictors; QUANT; NM HyperVision; Centralized Data Hub).	<i>What dissemination, exploitation and communication measures will you apply to the results?</i> Communication (awareness): SESAR-aligned branding; SESAR JU project page + partners' LinkedIn; milestone press releases; short explainer videos; Open/Demo Days around validations; presence at Airspace World, SESAR Innovation Days, TRA. (KPIs: ≥12 posts/quarter; ≥3 press releases; ≥4 videos; ≥150 cumulative attendees). Dissemination (knowledge transfer): Open-access publications and conference papers; targeted webinars/tech sessions; FAIR public assets (validation summaries, KPI tables, anonymised datasets, architecture/API summaries) on Zenodo & SESAR Library; policy/standards brief to EASA/EUROCAE/ICAO and EUROCONTROL NM. (KPIs: ≥3 OA papers; ≥4 conference talks; ≥6 FAIR uploads). Exploitation (uptake): Partner go-to-market roadmaps (licensing/servitisation); PPP/CEF pilots; engagement with airports/ANSPs/NM for shadow/live use; evidence packages for standardisation input. (KPIs: ≥3 LoIs/MoUs by M30; ≥1 pilot prepared by M36; ≥2 WG contributions).
TARGET GROUPS	OUTCOMES	IMPACTS
<i>Who will use or further up-take the results of the project? Who will benefit from the results of the project?</i> • Primary users: Airports (hub & regional), ANSPs/TWR/DTWR units, APOCs/AOCCs, EUROCONTROL NM. • Secondary: Ground handlers, OEMs/platform vendors, standardisation/regulatory bodies (EUROCAE, EASA, ICAO). • Indirect: Airlines/Ground Handlers and passengers (via improved predictability and punctuality).	<i>What change do you expect to see after successful dissemination and exploitation of project results to the target group(s)?</i> Operational adoption of AI-enabled taxiing tools (S1), SMAS deployments/fallback in real ops (S2), DTWR modules integrated into HMIs (S3) and improved safety nets. Advanced AOP platform used in live/shadow mode with AOP–NOP quality monitoring and end-to-end DCB (S4). Updated A-CDM/AOP/DTWR roadmaps; feedback/data flows to NM via ECRA/NMVP.	<i>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?</i> • Scientific: Demonstrated robust/transparent AI and HMI methods for safety-critical ATM; reusable datasets/methods. • Economic/Technological: Lower taxi-out time and fuel burn; higher surface capacity/predictability; reduced integration cost via NM B2B/ECRA; scalable cloud/SOA service models. • Societal/Environmental: Reduced CO₂/NO_x at airports; greater operational resilience (e.g., to GNSS anomalies); improved punctuality and user trust in human-oversighted automation.

3 Quality and efficiency of the implementation

3.1 Work plan and resources

NEURON is organised into 12 work packages (WPs) over 36 months and two periods (P1: M1–M18; P2: M19–M36), in line with the Horizon Europe lump-sum model and SESAR 3 JU guidance.

- WP1/2 (Management): coordination, quality, risk and reporting (P1/P2).
- WP11/12 (CDE): Communication, Dissemination & Exploitation (P1/P2).
- WP3–10 (technical): four solutions, each split across two WPs (P1→P2) covering associated deliverables OSED, VALP, VALR TS/IRS (single doc), STAND, REG, CBA, CN.

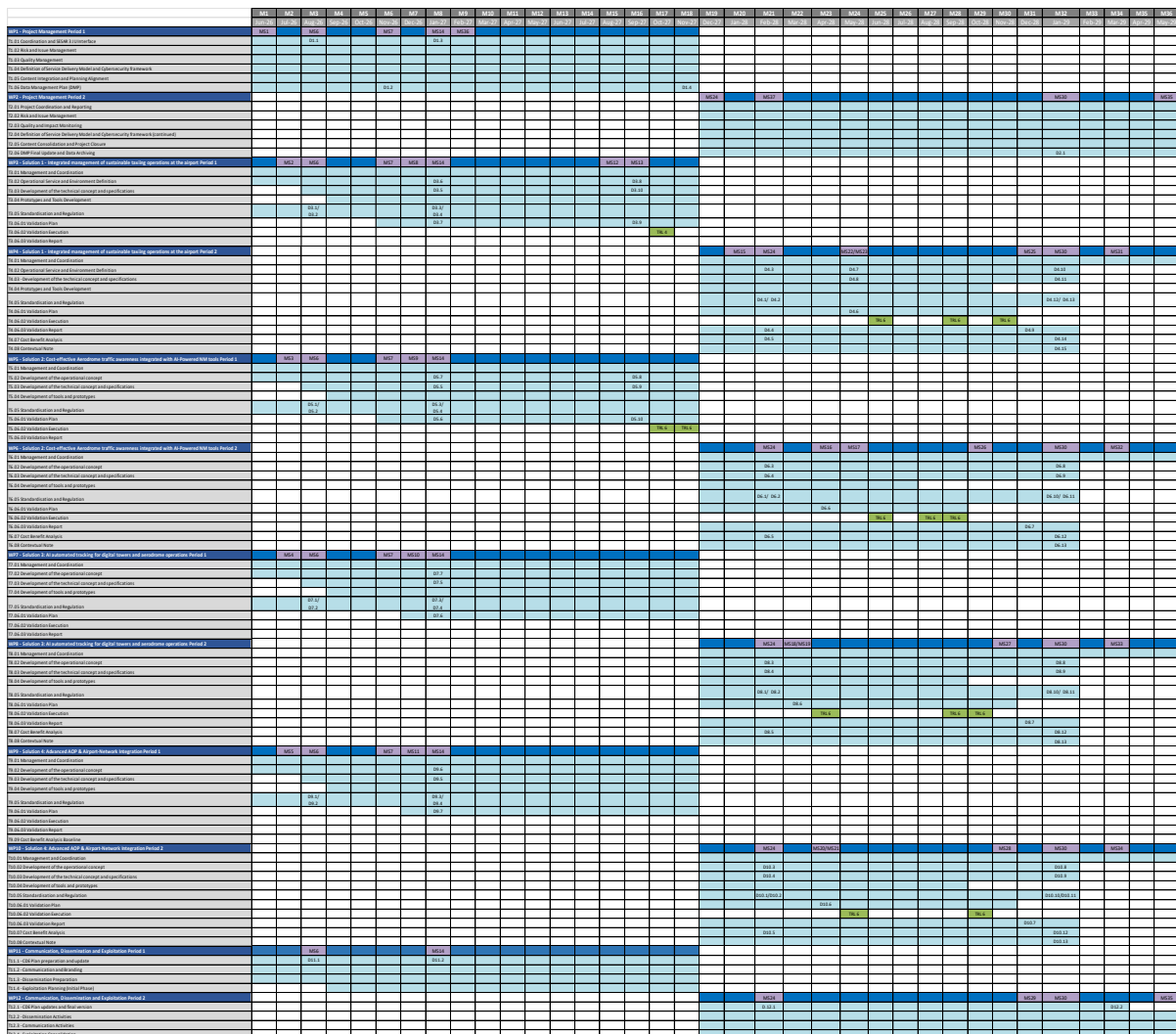
WP1/11 start at M1; technical P1 WPs (WP3/5/7/9) run M1–M18 and hand over to their P2 counterparts (WP4/6/8/10) for M19–M36; WP2/12 close at M36. Internal reviews around M9 and M21; maturity self-assessments at M2 and M18; exit maturity gate at M34.

Interdependencies: The four solutions progress in parallel under a common V-model + agile methodology and a service-oriented architecture .(See Section 1.2.2) . WP1/2 and WP11/12 provide cross-cutting support

Figure 9 PERT



Figure 10 Gantt Chart



3.1g: ‘Subcontracting costs’ items

AP-Tech		
	Cost (€)	Description of tasks and justification
Subcontracting	45.000	AP-Tech plans to subcontract part of its contribution to NEURON project linked to the Tasks in which AP-Tech will play the role of a Leader. The subcontractor will support drafting and development of deliverables. The subcontractor will be awarded based on the rule of best value of money and SESAR experience.
AIA		
	Cost (€)	Description of tasks and justification
Subcontracting	205.000	AIA will subcontract SESAR technical documentation—given limited in-house expertise—to ensure high-quality deliverables. AIA will lead concept definition, operational/technical implementation, and validation planning/execution. The subcontractor will produce and maintain SESAR documents (e.g., OSED, CBA, REG, CN), contribute to non-AIA-led SESAR docs based on AIA inputs, update them as the project evolves, assess performance under the SESAR Performance Framework using validation results, and define/align the operational EATM Architecture with the latest SESAR guidance. AIA will launch a tender in line with the Grant Agreement’s procurement provisions.
PLW		
	Cost (€)	Description of tasks and justification
Subcontracting	35.000	Software and AODB upgrade to the latest version to enable integration with the Network Manager, aligned with the system architecture and data standards, including operational data migration and validation. Rationale: current versions are not fully compatible and may cause inefficiencies and inconsistencies. Benefits: performance and security improvements (critical patches), regulatory/standards compliance, and a foundation for future integrations with other systems. Outcome: reduced risk of failures or data loss and ensured operational continuity.
GDN		
	Cost (€)	Description of tasks and justification
Subcontracting	35.000	Software and AODB upgrade to the latest version to enable integration with the Network Manager, aligned with the system architecture and data standards, including operational data migration and validation. Rationale: current versions are not fully compatible and may cause inefficiencies and inconsistencies. Benefits: performance and security improvements (critical patches), regulatory/standards compliance, and a foundation for future integrations with other systems. Outcome: reduced risk of failures or data loss and ensured operational continuity.
EUROCONTROL		
	Cost (€)	Description of tasks and justification
Subcontracting	100.000	Outsourcing is needed for the software development for the RTS on sustainable taxiing, EUROCONTROL outsource the development of the platform
	300.000	Development of the hyper vision tool for the validation of solution 4, EUROCONTROL outsource the development of the platform
DSNA		
	Cost (€)	Description of tasks and justification
Subcontracting	65.000	Support to Human Factor Sol#1 related activities s (2x wide scope exercises with DSNA ATCOs) and review of STX impact on D-MAN, FuSy Architecture.
	72.000	Support to Human Factor Sol#2 related activities (3x DSNA shadow mode/live trails exercises with ATCOs)
LFV		
	Cost (€)	Description of tasks and justification
Subcontracting	41.370,56	Remote Tower experts, external to LFV, from previous R&D projects with skills in Use Case and operational concept in OSED development
ENAIRe		
	Cost (€)	Description of tasks and justification
Subcontracting	15.000	ENAIRe will subcontract INECO personnel to support tasks requiring ATM R&D and CNS expertise. Historically, under SESAR 1 and SESAR 2020, these costs were declared as “secondment against payment” and deemed eligible by EC audits. However, the latest Annotated Grant Agreement (Art. 6.2.A.2) requires secondees to work under employee-like conditions (notably on-site presence). Post-pandemic, many INECO consultants work from their employer’s premises and are no longer considered structural staff; coupled with the commercial margin in the consulting relationship, ENAIRe will therefore declare these costs

as subcontracting for SESAR 3. This approach complies with Spain's public sector contracting law transposing EU procurement directives (2014/24/EU, 2014/25/EU, 2009/81/EC) and is consistent with CINEA projects where it has been used and audited.

3.2 Capacity of participants and consortium as a whole

3.2.1 Consortium Overview, complementarity and Strategic Fit

The NEURON consortium brings together 26 partners from 10 European countries, encompassing a strategic blend of airport operators, air navigation service providers (ANSPs), technology leaders, SMEs, research institutions, and institutional stakeholders. This mix brings the operational, technical, regulatory and scientific capabilities needed to reach TRL-6 on a service-oriented, SWIM-compliant ATS platform aligned with the SESAR 3 JU vision, and reaching Automation Level 4 at some stages (See Table 2).

The NEURON consortium has been structured to ensure strong complementarity across roles, expertise and assets, covering the entire innovation value chain — from early concept development and prototyping to validation, operational testing and alignment with regulatory and deployment roadmaps.

The project is coordinated by **INDRA**, one of Europe's most prominent industrial players in ATM modernisation. Each of the four NEURON Solutions is led by a different type of actor, reflecting the balanced structure and vertical integration of the consortium: **Solution 1** NLR (research/validation), **Solution 2** AP-Tech (SME/airport systems), **Solution 3** INDRA (platform industrialisation), **Solution 4** AIA (airport/APOC deployment).

- **Large industry & platform integrators:** **INDRA**, **INDRA NAVIA**, **MINSAIT**, **ENAV/Techno Sky**, **AIRBUS SAS/AIRBUS Operations** — ensuring productization, integration and scalability across AOP, DTWR and surveillance domains.
- **Airport Operators:** **AIA**, **ADP**, **SNBV (Schiphol)**, **CPH**, **AVINOR**, **GDN**, **PLW** — covering metropolitan and regional hubs and providing live environments for validation.
- **ANSPs and institutional/regulatory expertise:** **EUROCONTROL** (NM platforms, SESAR alignment); **DSNA**, **ENAIER/CRIDA**, **ENAV**, **HUNGAROCNTRNOL**, **LFV**, **PANSA** — bringing operational perspectives, safety-critical validation experience and standardisation pathways.
- **Scientific excellence:** **DLR**, **ENAC**, **NLR**, **DBL** — modelling, performance analysis, human factors and validation methodology.
- **High-tech SMEs:** **AP-Tech** (S2 lead; A-SMGCS/SMAS), **PILDO** (validation, GNSS), **NEXT** (AI, cybersecurity, systems integration).
- **Ground handling / airline operations:** **GOLDAIR** — APOC/ACDM processes and turnaround management (airside and landside processes) integration, contributing to Solution 4 validation.

Gender balance and diversity considerations are incorporated in the **governance and team composition** at partner level.

3.2.2 Access to critical infrastructure

The NEURON consortium ensures full access to operational, technical, and simulation infrastructures required to develop, prototype, and validate the four proposed SESAR Solutions up to **TRL6**, in line with the requirements set by the **SESAR 3 JU Project Handbook v2**.

The infrastructure made available by the partners includes **live airport environments**, **digital tower systems**, **simulation labs**, and **validation platforms**, as summarised in the table below. All these facilities are owned or operated by the consortium members.

Infrastructure	Partners	Sol 1	Sol 2	Sol 3	Sol 4
Airport environments and ATS platforms	AIA – APOC, hardware and software, aerodrome safety infrastructure at Athens International Airport.			X	X
	SNBV - Collaborative surface ops at Schiphol	X			X
	GDN Operational ground surveillance systems at regional Gdansk airport; available for validation activities. Movement area, A-SMGCS platform, AODB platform.		X		
	PLW - Operational ground surveillance systems at regional Wroclaw airport; available for validation activities. Movement area, A-SMGCS platform and its infrastructure.		X		
	GOLDAIR - APOC & Software Infrastructure				X
	AVINOR - Remote Tower capable infrastructure in Oslo; full access to validation testbeds across Norway.		X		
	INDRA – Operational AOP platform aligned with SESAR (AOP-to-NOP integration) and IRTOS platform	X		X	X
	AP-Tech – ATOS A-SMGCS/SMAS Platform at Gdańsk Airport, available for adjustment and validation in real scenarios.		X		

	PANSA - [SMAS in Polish Airports (Gdańsk and Wrocław)		X		
Digital tower and remote system operations	INDRA NAVIA -- InNOVA ATM System: fully integrated A-SMGCS, tower and approach system deployed globally; supports validation of AI-enhanced tower capabilities.	X	X	X	
	ENAV – ENAV National Test Facility, Digital Tower Suite, ACC/TWR controls and validation environments.			X	
	HUNGAROCONTROL – mirTWR: modular remote tower simulation infrastructure.			X	
	DSNA - SMAS in French airports		X		
	AVINOR – Remote Tower Working Position (Oslo) linked to national RTS.		X		
	LFV - RTC Stockholm: operational remote TWR Centre with four Swedish aerodromes (ESNQ, ESNZ, ESNV, ESMS).			X	
Network Management and DCB platforms	EUROCONTROL - ECRA platform and NM B2B access for validation of collaborative DCB, AOP/NOP alignment and airport-network planning scenarios. eDEP Platform	X			X
Simulation, validation & R&D labs	NLR - NARSIM HITL Tower simulator; full ATC working environment simulation for controller behaviour and interface validation.	X			
	ENAC – ACHIL Lab: real-time HMI simulation platform with controller positions, cockpit simulators and pseudo pilots.	X			
	ENAV - internal testbed dedicated to AI-based developments and simulations, supporting the evolution of advanced ATS functionalities. INNOVATION LAB			X	
	ENAIRE - ADS-B Ground surveillance systems in Spanish airports, Traffic Control Platform		X		
	CRIDA - Airport tower simulator		X		

3.2.3 Role of the participants

The table below presents a **cross-matrix of core technical and operational capacities**, showing which partners contribute to each of the 10 key domains required to deliver the project. This provides a visual confirmation that **all critical knowledge areas are covered**, and that there are adequate redundancy and balance.

Partner	AOP / APOC	AI / ML	Digital TWR / CV	Video Sensors (Cameras)	Surveillance / A-SMGCS SMAS	DCB / NM	Human Factors / HMI	HITL / Simulation	Regulation / Std.	Cyber / Safety	Deployment / Validation
INDRA	☑	☑	☑	☑	☑	☑					☑
INDRA NAVIA		☑	☑	☑	☑				☑	☑	☑
AP-Tech		☑			☑	☑	☑			☑	☑
AIA	☑	☑		☑	☑		☑				☑
ADP	☑				☑				☑		☑
CPH	☑										☑
SNBV	☑				☑						☑
GDN					☑						☑
PLW					☑						☑
GOLDAIR	☑										☑
AVINOR				☑	☑						☑
EUROCONTROL	☑	☑			☑	☑	☑		☑	☑	☑
ENAIRE					☑				☑		☑
CRIDA	☑					☑			☑		☑
DSNA		☑			☑	☑	☑		☑	☑	☑
ENAV / TECHNOSKY		☑	☑	☑	☑		☑				☑
HUNGAROCONTROL			☑	☑	☑		☑			☑	☑
LFV			☑		☑				☑		☑
PANSA					☑				☑		☑
AIRBUS SAS/OPS											☑

NLR		☑	☑				☑	☑			☑
DLR	☑	☑				☑	☑	☑			☑
ENAC							☑	☑			☑
PILDO	☑					☑				☑	☑
NEXT		☑	☑	☑	☑		☑			☑	☑
DBL							☑	☑		☑	

The table below summarises the **main role and justification** for each partner, grouped by category. Each has a defined role in one or more solutions, with adequate person-months and access to infrastructure (as described in Sections 1.1.2 and Part A).

Category	Partner	Main Role / Solutions	Key Contributions & Justification
Airports	AIA	Leader Sol 4; validation Sol 3 & 4	APOC, AOP, Safety Nets, predictive systems; testbed for AI, Aerodrome Safety and AOP modules
	ADP	Validation Sol 1 & 4	CDG for Tug Fleet Manager and Dynamic Taxi (STX); CDG/Orly for enhanced AOP–NOP data sharing.
	CPH	Requirement Definition/Validation Sol 1	User feedback on Tug Fleet Manager and Dynamic Taxi outputs; advanced A-CDM/AOP (Network Integrated).
	SNBV	Validation Sol 1 & 4	Schiphol surface ops; stakeholder coordination; live/shadow trials of Tug Fleet Manager and STX for enhanced AOP–NOP data sharing.
	AVINOR	Validation Sol 2	Remote tower infrastructure and regional ops
	GOLDAIR	Validation Sol 4	A-CDM/AOP implementation, predictive systems, Aircraft turnaround processes
	GDN	Validation Sol 2	Regional airports with ground surveillance
	PLW	Validation Sol 2	Regional airports with ground surveillance
Industry	INDRA	Coord.; Tech contributor Sol 1, 3, 4	Development of Tug Fleet Manager and Dynamic Taxi; AOP, SWIM, and integration.
	INDRA NAVIA	Integration Sol 1 & 2 & 3	InNOVA ATM; fallback logic; A-SMGCS interfaces supporting route/clearance coordination with Tug Fleet Manager; DTWR interfaces.
	AP-Tech	Leader Sol 2; contributor Sol 4	A-SMGCS/SMAS platform; system integration and interfaces
	AIRBUS SAS / OPS	Operational input and validation Sol 1	Low-emission taxi operational concept (single-engine) and interfaces with EFB/Cockpit (needs, conditions, risks, improvements).
	ENAV / TECHNOS KY	Integration & validation Sol 3	DTWR testbed, EFPS/HMI development
	PILDO	Decision-support Sol 4	CDM algorithms, APOC logic
	NEXT	DTWR HMI Sol 3	DTWR HMI development & integration
International Organisation	EUROCONTROL	Operational Input, Safety, Validation Contribution to all NEURON solutions	ECRA, NM B2B/NMVP, SESAR roadmap alignment, eDEP Tower Simulator
ANSPs	ENAIRES	KPIs & validation Sol 2	SMAS with GNSS Quality Monitoring
	CRIDA	KPIs & validation Sol 2	ATM operations & performance modelling
	DSNA	Validation & fallback Sol 1 & 2	Definition/validation of D-MAN and A-SMGCS for sustainable taxi; RT phraseology/procedures for tug-tow; SMAS mode for degraded A-SMGCS; centralized SMAS for non-A-SMGCS airports.
	HUNGARCONTR	DTWR validation Sol 3	mirTWR with ATCOs, contribution of ATM/operational experts, technical-, human performance- and safety experts during the validation.
	LFV	DTWR validation Sol 3	Operational RTC input, experts with RTC experience and deployment of digital solutions for Remote Towers
	PANSA	Validation Sol 2	Polish ANSP; realism in SMAS validation
	ENAV	Integration & validation Sol 3	DTWR testbed and support to developments relevant to the use of AI
Research Academia	NLR	Leader Sol 1	HITL simulator; validation of Tug Fleet Manager and Dynamic Taxi; SESAR validation lead.
	DLR	Sol 1 and 4 Concept Development, and validation Human Factors Lead	Algorithms and models for turnaround events, flows and for PAX/BAG prediction as part of Global DCB OSED and TS/IRS development; ACCES simulator as HITL APOC and Global DCB testbed and rapid prototyping environment for OSED/TS/IRS

			development, Human Factors expertise for VALP and OSED Parts III Human Performance, Execution monitoring and debriefing for VALR.
	ENAC	HMI validation Sol 1	ACHIL lab (cognitive simulation); HMI/phraseology assessment for Tug Fleet Manager and Dynamic Taxi.
	DBL	Human factors Sol 2 & 3	Usability, safety assurance, ethical-AI guidance.

The consortium ensures coverage of the entire value chain — from research to product, operation, and regulation — and guarantees that **no critical knowledge area is missing** for the delivery of NEURON's objectives.

3.2.4 Commercial and Industrial Exploitation Potential

NEURON is industry-led and operator-pulled. A strong vendor core (INDRA/INDRA NAVIA/MINSAIT, AP-Tech, ENAV/TECHNOSKY, PILDO, NEXT, AIRBUS)—collectively responsible for more than 33% of the project budget—co-develops the solutions with early-adopter airports and ANSPs (ADP, CPH, SNBV/Schiphol, AIA, AVINOR, GDN, PLW; ENAV, ENAIRE/CRIDA, DSNA, HUNGAROCONTROL, LFV, PANSA) and with EUROCONTROL (NM) as network integrator. This composition turns TRL-6 results into deployable products/services while ensuring operational pull, standardisation input and network-level scaling.

Who will commercialise/adopt what:

Solution 1 – Sustainable taxiing (Tug FM + Dynamic Taxi)

- Commercial owners: INDRA (airport ops tools) + INDRA NAVIA (A-SMGCS integration), AIRBUS (cockpit/EFB support).
- Early adopters / internal use: ADP, CPH, SNBV; DSNA to support large-scale STX deployment.
- Declared intent: AIRBUS (internal + product support for single-engine taxi/EFB); ADP (ops uptake); EUROCONTROL (standardise sustainable surface movement).

Solution 2 – SMAS (cost-effective surface awareness + NM/ECRA)

- Commercial owners: AP-Tech (service/product) with INDRA NAVIA(integration/sensors).
- Early adopters / internal use: GDN, PLW (local ground surveillance integration); AVINOR (remote-tower airports, standards contribution); ENAIRE/CRIDA, DSNA, PANSA (procedures and ANSP uptake).
- Declared intent: AP-Tech to bring SMAS to market; airports to integrate into existing platforms; EUROCONTROL to ensure ECRA/NM connectivity.

Solution 3 – AI visual tracking for digital/remote towers

- Commercial owners: INDRA/MINSAIT (DTWR suite modules), ENAV/TECHNOSKY (DTWR product line), NEXT (AI components).
- Early adopters / internal use: HUNGAROCONTROL (Budapest DTWR), ENAV (Brindisi/Perugia), AIA (Athens / Aerodrome safety module); LFV (ops concept); EUROCONTROL (standards channel).
- Declared intent: ENAV/Techno Sky to incorporate AI module; AIA to use for aerodrome safety nets; EUROCONTROL to route evidence to EUROCAE/EASA/ICAO.

Solution 4 – Advanced AOP & AOP–NOP integration (predictors, QUANT, NM links)

- Commercial owners: INDRA (Advanced AOP & services) in coordination with EUROCONTROL (ECRA/NM services); AP-Tech/PILDO for integration components.
- Early adopters / internal use: AIA + GOLDAIR (Advanced AOP for APOC operations); benefit transfer to ADP/SNBV; airlines via NM services.
- Declared intent: GOLDAIR (turnaround optimisation); EUROCONTROL (improve NM products, data quality standards); AIA (operational deployment path).

3.2.5 International Organisations and Eligibility

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

For reference, EUROCONTROL's contribution per Work Package in the project is as follows:

WP 1	WP 2	WP3	WP4	WP5	WP6	WP7	WP8	WP9	WP10	WP11	WP12	Total
-	-	417.046,88	906.875,00	430.937,50	494.828,13	132.781,25	132.781,25	857.796,88	857.796,88	25.046,88	70.140,63	4.326.031,25

4 Ethics

Ethical dimension of the objectives, methodology and likely impact

The identified ethics issues are:

- Two beneficiaries are based on a non-EU country: Indra Navia AS (Indra's affiliated member) and AVINOR, both from Norway.
- The project involves the development of AI/ML models

This information is completed in the "NEURON Technical Annex of Ethics" attached

Compliance with ethical principles and relevant legislations

NEURON will comply with ethical principles and relevant national and European legislation and regulations. The description about how the issues identified will be addressed is provided and completed in the "NEURON Technical Annex for Ethics" attached.

Technical Annex for Ethics

Introduction

This technical annex provides complementary information on ethics aspects flagged in Part A (Ethics Issues Table) for the NEURON proposal. It follows the same structure used in prior SESAR 3 projects and focuses on the specific applicability to NEURON's scope and solutions.

Ethics assessment

- Human Embryonic Stem Cells and Human Embryos

Not applicable. NEURON does not perform any activity involving human embryonic stem cells or human embryos.

- Humans

Not applicable. No clinical trials or research involving human participants are foreseen.

- Human Cells/Tissues (not covered by section 2.1)

Not applicable. NEURON does not use human cells or tissues.

- Personal Data

Not applicable. NEURON does not plan to process personal data.

For **video analytics in Solution 3**, only airside operational imagery (aircraft/vehicles/surface) is used. Any incidental capture of individuals will be prevented or mitigated (field-of-view configuration, masking/blurring if required, strict access control, short retention, secure storage). No biometric identification, re-identification, or tracking of persons is undertaken. If a Data Protection Impact Assessment (DPIA) is deemed necessary by a site operator, it will be performed and its safeguards implemented before data collection.

- Animals

Not applicable. No animal use is foreseen.

- Non-EU Countries

Two beneficiaries are established in **Norway** (an **Associated Country** to Horizon Europe within the EEA): **Avinor** and **Indra Navia AS**.

- **Nature of activities:** provision and evolution of operational platforms/testbeds (e.g., remote/digital tower environments; tower/A-SMGCS integration) and related technical support.

- **Data:** activities are limited to **operational, non-personal** aeronautical data (e.g., surveillance messages, flight operational timestamps, equipment status). No personal data are exported/imported.
 - **Resources:** local staff and standard lab/OPS infrastructure; no elevated risk to personnel.
 - **Transfers/compliance:** as Norway is in the EEA, cross-border data flows remain in an EU/EEA legal environment. Where applicable, airport/ANSP data-sharing agreements govern access, minimisation and security.
- These arrangements are standard for SESAR projects and do not raise additional ethics risks.

➤ Environment, Health and Safety

Not applicable (no specific EHS risks). All integration/validation takes place in labs or controlled OPS environments under airport/ANSP safety management systems and local procedures (e.g., RAMS, site inductions, work permits).

➤ Artificial Intelligence

NEURON develops AI/ML components in four solutions. In all cases **humans remain in the loop**; AI outputs are decision-support (no automated authority over safety-critical clearances). NEURON follows the EASA AI guidance for low-risk, assistive applications (transparency, explainability, human oversight, data governance, robustness).

Solution 1 — Sustainable Taxiing (Tug Fleet Manager + Dynamic Taxi)

- **AI/ML use:** taxi-time prediction, resource/tug allocation support, environmental triggers and recommendation logic for single-engine/engine-off taxiing.
- **Automation level:** **AL2** (advisory). Controllers/airport operations validate or ignore recommendations; no automatic clearances.
- **Data:** **no personal data**; A-SMGCS tracks, flight schedules, stand/route states, weather/air-quality inputs.
- **Ethical safeguards:** human oversight; model cards & KPI dashboards; non-discrimination (no human attributes processed); privacy-by-design (no PII); environmental benefit (reduced fuel/CO₂).
- **Expected benefits:** better predictability (TTOT/EXOT), reduced emissions and surface congestion, reduced workload via consistent decision-support.

Solution 2 — SMAS (cost-effective surface awareness + NM/ECRA)

- **AI/ML use:** (i) **GNSS vulnerability monitoring** (jamming/spoofing detection) for ADS-B trust assessment; (ii) **AI-enhanced NM/ECRA** predictions to improve resilience; (iii) **video-based mobile detection** to support surface traffic awareness.
- **Automation level:** Perception **AL4** (automated acquisition/quality assessment), Analysis **AL4** (automatic alerts), Decision **AL2** and Execution **AL2** (human validates/overrides).
- **Data:** **no personal data**; flight/surveillance feeds and airside video for detection (no biometric/person processing).
- **Ethical safeguards:** continuous human oversight; explainable outputs (confidence/summary); non-discrimination; privacy preserved; safety and environmental gains (fewer taxi delays, more efficient surface flow).
- **Expected benefits:** higher GNSS/ADS-B reliability; improved planning via NM predictions; efficiency/resilience gains.

Solution 3 — AI Visual Tracking for Digital/Remote Towers

- **AI/ML use:** multi-target visual tracking, ground-label smoothing, **video-based weather** classification, aerodrome safety alerts (e.g., FOD/wildlife/incursions).
- **Automation level:** Perception **AL4** (detection/tracking), Decision/Execution **AL2** (advisories and alerts; ATCO remains responsible).
- **Data:** **no personal data planned**; airside videos restricted to operational scenes. Any incidental capture of individuals is mitigated (masking, FOV configuration), data kept in secure environments, short retention.
- **Ethical safeguards:** human oversight; explainable performance dashboards; no facial/biometric processing; privacy-by-design; safety benefits under adverse visibility.
- **Expected benefits:** increased situational awareness, reduced workload via stable HMI labels, improved safety nets.

Solution 4 — Advanced AOP & Airport–Network Integration

- **AI/ML use: predictions** for flights, passengers and baggage to detect demand-capacity imbalances across airport areas; real-time alerts with confidence indicators to support human decision-making (no replacement of human responsibility).
- **Automation level: AL2** (advisory).
- **Data: no personal data**; only operational flight/baggage/throughput timestamps and counts.
- **Ethical safeguards**: human oversight; transparent dashboards; non-discrimination; privacy respected; societal/environmental benefit via improved efficiency and delay reduction.
- **Expected benefits**: better short-term demand visibility (flights/PAX/BAG), earlier detection of bottlenecks, faster decisions, higher operational resilience.

➤ Other Ethics Issues

Not applicable. No additional ethics concerns are anticipated beyond those addressed above.

End of Annex

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 Period 1	WP2 Project Management Period 2	WP3 Solution 1 - Integrated management of sustainable taxiing operations at the airport. Period 1	WP4 Solution 1 - Integrated management of sustainable taxiing operations at the airport. Period 2	WP5 Solution 2: Cost-effective Aerodrome traffic awareness integrated with AI-Powered NM tools. Period 1	WP6 Solution 2: Cost-effective Aerodrome traffic awareness integrated with AI-Powered NM tools. Period 2	WP7 Solution 3: AI automated tracking for digital towers and aerodrome operations. Period 1	WP8 Solution 3: AI automated tracking for digital towers and aerodrome operations. Period 2	WP9 Solution 4: Advanced AOP & Airport-Network Integration. Period 1	WP10 Solution 4: Advanced AOP & Airport-Network Integration. Period 2	
Forms of funding	Lump sum contribution	Lump sum contribution	Lump sum contribution	Lump sum contribution	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	h	i	j	m = a + b + c + d + e + f + g + h + i + j + k + l
1 - INDRA	209 851.25	214 792.81	243 474.00	310 569.00	0.00	0.00	459 877.03	433 519.02	399 648.38	453 576.38	2 795 193.68
1.1 - INDRA NAVIA	0.00	0.00	83 881.32	457 441.53	251 154.03	517 454.39	39 975.24	66 438.73	0.00	0.00	1 416 345.24
1.2 - MINSAIT	20 688.50	0.00	0.00	0.00	0.00	0.00	130 401.25	166 731.25	0.00	0.00	317 821.00
2 - NLR	13 896.08	14 813.96	149 452.51	278 699.66	0.00	0.00	0.00	0.00	0.00	0.00	456 862.21
3 - AP-Tech	15 566.25	14 035.00	0.00	0.00	409 333.75	397 993.75	0.00	0.00	130 348.75	130 348.75	1 132 678.75
4 - AIA	7 875.00	7 875.00	0.00	0.00	0.00	0.00	111 391.87	129 766.87	209 514.38	220 014.38	723 712.50
5 - ADP	0.00	0.00	121 800.00	135 100.00	0.00	0.00	0.00	0.00	84 140.00	77 700.00	432 180.00
6 - SNBV	0.00	0.00	212 581.25	224 962.50	0.00	0.00	0.00	0.00	74 200.00	64 137.50	580 475.00
7 - AVINOR	0.00	0.00	0.00	0.00	43 769.33	148 946.53	0.00	0.00	0.00	0.00	192 715.86
8 - CPH	0.00	0.00	38 650.00	35 900.00	0.00	0.00	0.00	0.00	0.00	0.00	74 550.00
9 - GDN	0.00	0.00	0.00	0.00	67 626.56	52 620.31	0.00	0.00	0.00	0.00	123 910.94
10 - PLW	0.00	0.00	0.00	0.00	70 981.75	49 247.63	0.00	0.00	0.00	0.00	123 904.38
11 - GOLDAIR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	82 512.50	82 512.50	179 375.00
12 - EUROCONTROL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13 - HUNGAROCNTROL	0.00	0.00	0.00	0.00	0.00	0.00	34 062.03	42 233.93	0.00	0.00	82 400.23
14 - DSNÄ	0.00	0.00	120 635.20	177 704.80	209 982.50	103 334.00	0.00	0.00	0.00	0.00	621 026.70
15 - LFV	0.00	0.00	0.00	0.00	0.00	0.00	157 587.56	163 011.66	0.00	0.00	320 599.22
16 - PANSÄ	0.00	0.00	0.00	0.00	119 332.50	150 780.00	0.00	0.00	0.00	0.00	270 112.50
17 - AIRBUS SAS	0.00	0.00	17 842.56	23 206.75	0.00	0.00	0.00	0.00	0.00	0.00	41 049.31
18 - AIRBUS OPS	0.00	0.00	29 407.88	24 069.06	0.00	0.00	0.00	0.00	0.00	0.00	53 476.94
19 - ENÄV	0.00	0.00	0.00	0.00	0.00	0.00	64 687.79	102 179.93	0.00	0.00	180 800.83
19.1 - TECHNO SKY	0.00	0.00	0.00	0.00	0.00	0.00	101 673.14	90 995.74	0.00	0.00	192 668.88
20 - ENÄIRE	0.00	0.00	0.00	0.00	14 000.00	45 062.50	0.00	0.00	0.00	0.00	59 062.50
20.1 - CRIDA	0.00	0.00	0.00	0.00	52 062.50	47 906.25	0.00	0.00	0.00	0.00	99 968.75
21 - PILDO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	59 937.50	58 625.00	130 025.00
22 - NEXT	0.00	0.00	0.00	0.00	0.00	0.00	93 691.39	97 992.24	0.00	0.00	191 683.63
23 - DLR	0.00	0.00	92 638.44	90 221.64	0.00	0.00	0.00	0.00	119 004.62	203 637.18	565 889.17
24 - ENÄC	0.00	0.00	168 525.00	51 800.00	0.00	0.00	0.00	0.00	0.00	0.00	220 325.00
25 - DBL	0.00	0.00	0.00	0.00	72 625.00	84 875.00	89 250.00	110 250.00	0.00	0.00	357 000.00
Σ consortium	267 877.08	251 516.77	1 278 888.16	1 809 674.94	1 310 867.92	1 598 220.36	1 282 597.30	1 403 119.37	1 159 306.13	1 290 551.69	11 935 813.22

Forms of funding	Estimated EU contribution		
	Estimated eligible lump sum contributions (per work package)		Maximum grant amount ¹
	WP11 Communication, Dissemination and Exploitation. Period 1	WP12 Communication, Dissemination and Exploitation. Period 2	
	Lump sum contribution	Lump sum contribution	
	k	l	m = a + b + c + d + e + f + g + h + i + j + k + l
1 - INDRA	25 760.00	44 125.81	2 795 193.68
1.1 - INDRA NAVIA	0.00	0.00	1 416 345.24
1.2 - MINSAIT	0.00	0.00	317 821.00
2 - NLR	0.00	0.00	456 862.21
3 - AP-Tech	17 526.25	17 526.25	1 132 678.75
4 - AIA	11 637.50	25 637.50	723 712.50
5 - ADP	3 010.00	10 430.00	432 180.00
6 - SNBV	0.00	4 593.75	580 475.00
7 - AVINOR	0.00	0.00	192 715.86
8 - CPH	0.00	0.00	74 550.00
9 - GDN	2 313.28	1 350.79	123 910.94
10 - PLW	1 925.00	1 750.00	123 904.38
11 - GOLDAIR	7 175.00	7 175.00	179 375.00
12 - EUROCONTROL	0.00	0.00	0.00
13 - HUNGAROCNTR0L	0.00	6 104.27	82 400.23
14 - DSNA	3 123.40	6 246.80	621 026.70
15 - LFV	0.00	0.00	320 599.22
16 - PANS4	0.00	0.00	270 112.50
17 - AIRBUS SAS	0.00	0.00	41 049.31
18 - AIRBUS OPS	0.00	0.00	53 476.94
19 - ENAV	6 966.55	6 966.56	180 800.83
19.1 - TECHNO SKY	0.00	0.00	192 668.88
20 - ENAIRE	0.00	0.00	59 062.50
20.1 - CRIDA	0.00	0.00	99 968.75
21 - PILDO	5 731.25	5 731.25	130 025.00
22 - NEXT	0.00	0.00	191 683.63
23 - DLR	26 342.96	34 044.33	565 889.17
24 - ENAC	0.00	0.00	220 325.00
25 - DBL	0.00	0.00	357 000.00
Σ consortium	111 511.19	171 682.31	11 935 813.22

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

STICHTING KONINKLIJK NEDERLANDS LUCHT - EN RUIMTEVAARTCENTRUM (NLR), PIC 999987066, established in ANTHONY FOKKERWEG 2, AMSTERDAM 1059 CM, Netherlands,

hereby agrees

to become beneficiary

in Agreement No 101288156 — NEURON ('the Agreement')

between INDRA SISTEMAS SA (INDRA) and SESAR3 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

AP-TECH SP. Z O.O. (AP-Tech), PIC 885702054, established in ZAGLOBY 5, ZAMOSĆ 22-400, Poland,

hereby agrees

to become beneficiary

in Agreement No 101288156 — NEURON ('the Agreement')

between INDRA SISTEMAS SA (INDRA) **and** **SESAR3 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

ATHENS INTERNATIONAL AIRPORT S.A. (AIA), PIC 999484994, established in ODOS SPATA ATTIKIS, SPATA 190 19, Greece,

hereby agrees

to become beneficiary

in Agreement No 101288156 — NEURON ('the Agreement')

between INDRA SISTEMAS SA (INDRA) and SESAR3 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

AEROPORTS DE PARIS SA (ADP), PIC 957080474, established in 1 RUE DE FRANCE,
TREMBLAY-EN-FRANCE 93290, France,

hereby agrees

to become beneficiary

in Agreement No 101288156 — NEURON ('the Agreement')

between INDRA SISTEMAS SA (INDRA) and SESAR3 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

SCHIPHOL NEDERLAND BV (SNBV), PIC 999931388, established in EVERT VAN DE BEEKSTRAAT 202, LUCHTHAVEN SCHIPHOL 1118 ZG, Netherlands,

hereby agrees

to become beneficiary

in Agreement No 101288156 — NEURON ('the Agreement')

between INDRA SISTEMAS SA (INDRA) and SESAR3 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

AVINOR AS (AVINOR), PIC 938275375, established in DRONNING EUFEMIAS GATE 6, OSLO 0191, Norway,

hereby agrees

to become beneficiary

in Agreement No 101288156 — NEURON ('the Agreement')

between INDRA SISTEMAS SA (INDRA) and SESAR3 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

KOBENHAVNS LUFTHAVNE AS (CPH), PIC 950806223, established in LUFTHAVNSBOULEVARDEN, KASTRUP 2770, Denmark,

hereby agrees

to become beneficiary

in Agreement No 101288156 — NEURON ('the Agreement')

between INDRA SISTEMAS SA (INDRA) and SESAR3 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

PORT LOTNICZY GDANSK SP ZOO (GDN), PIC 905290040, established in Słowackiego 200, Gdansk 80-298, Poland,

hereby agrees

to become beneficiary

in Agreement No 101288156 — NEURON ('the Agreement')

between INDRA SISTEMAS SA (INDRA) and SESAR3 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

PORT LOTNICZY WROCLAW SA (PLW), PIC 888386529, established in UL. GRANICZNA 190, WROCLAW 54-530, Poland,

hereby agrees

to become beneficiary

in Agreement No 101288156 — NEURON ('the Agreement')

between INDRA SISTEMAS SA (INDRA) and SESAR3 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

GOLDAIR EXYPIRETISEIS EDAFOUS ANONIMI ETAIREIA (GOLDAIR), PIC 952207194,
established in DAA EL VENIZELOS KTIRIO 24, SPATA 190 19, Greece,

hereby agrees

to become beneficiary

in Agreement No 101288156 — NEURON ('the Agreement')

between INDRA SISTEMAS SA (INDRA) **and** **SESAR3 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

EUROCONTROL - EUROPEAN ORGANISATION FOR THE SAFETY OF AIR NAVIGATION (EUROCONTROL), PIC 999483733, established in Rue de la Fusée 96, BRUXELLES 1130, Belgium,

hereby agrees

to become beneficiary

in Agreement No 101288156 — NEURON ('the Agreement')

between INDRA SISTEMAS SA (INDRA) and SESAR3 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

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

hereby agrees

to become beneficiary

in Agreement No 101288156 — NEURON ('the Agreement')

between INDRA SISTEMAS SA (INDRA) and SESAR3 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

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 101288156 — NEURON ('the Agreement')

between INDRA SISTEMAS SA (INDRA) and SESAR3 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

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

hereby agrees

to become beneficiary

in Agreement No 101288156 — NEURON ('the Agreement')

between INDRA SISTEMAS SA (INDRA) and SESAR3 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

POLSKA AGENCJA ZEGLUGI POWIETRZNEJ (PANSA), PIC 995562023, established in UL. WIEZOWA 8, WARSZAWA 02 147, Poland,

hereby agrees

to become beneficiary

in Agreement No 101288156 — NEURON ('the Agreement')

between INDRA SISTEMAS SA (INDRA) and SESAR3 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

AIRBUS (AIRBUS SAS), PIC 999963010, established in 2 ROND POINT EMILE DEWOITINE,
BLAGNAC 31700, France,

hereby agrees

to become beneficiary

in Agreement No 101288156 — NEURON ('the Agreement')

between INDRA SISTEMAS SA (INDRA) and SESAR3 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

AIRBUS OPERATIONS SAS (AIRBUS OPS), PIC 991247948, established in ROUTE DE BAYONNE 316, TOULOUSE 31060, France,

hereby agrees

to become beneficiary

in Agreement No 101288156 — NEURON ('the Agreement')

between INDRA SISTEMAS SA (INDRA) and SESAR3 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

ENAV SPA (ENAV), PIC 998197513, established in VIA SALARIA 716, ROMA 00138, Italy,

hereby agrees

to become beneficiary

in Agreement No 101288156 — NEURON (‘the Agreement’)

between INDRA SISTEMAS SA (INDRA) and SESAR3 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

ENAIRE (ENAIRE), PIC 997701843, established in AVENIDA DE ARAGON S/N BLOQUE 330, PORTAL 2 PARQUE EMPRESARIAL LAS MERCEDES, MADRID 28022, Spain,

hereby agrees

to become beneficiary

in Agreement No 101288156 — NEURON ('the Agreement')

between INDRA SISTEMAS SA (INDRA) and SESAR3 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

PILDO CONSULTING SL (PILDO), PIC 998162690, established in c/ Bac de Roda 120 (Local 2), BARCELONA 08019, Spain,

hereby agrees

to become beneficiary

in Agreement No 101288156 — NEURON ('the Agreement')

between INDRA SISTEMAS SA (INDRA) and SESAR3 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

NEXT INGEGNERIA DEI SISTEMI SPA (NEXT), PIC 996607489, established in VIA GIACOMO PERONI 452, ROMA 00131, Italy,

hereby agrees

to become beneficiary

in Agreement No 101288156 — NEURON ('the Agreement')

between INDRA SISTEMAS SA (INDRA) and SESAR3 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

DEUTSCHES ZENTRUM FÜR LUFT - UND RAUMFAHRT EV (DLR), PIC 999981731,
established in LINDER HOHE, KOLN 51147, Germany,

hereby agrees

to become beneficiary

in Agreement No 101288156 — NEURON ('the Agreement')

between INDRA SISTEMAS SA (INDRA) and SESAR3 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

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 101288156 — NEURON ('the Agreement')

between INDRA SISTEMAS SA (INDRA) and SESAR3 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

DEEP BLUE SRL (DBL), PIC 998325941, established in VIA DANIELE MANIN 53, ROMA 00185, Italy,

hereby agrees

to become beneficiary

in Agreement No 101288156 — NEURON ('the Agreement')

between INDRA SISTEMAS SA (INDRA) and SESAR3 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 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 2015/444¹ 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 Integrity².

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 Commons 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 Europe³ ('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 traceability⁵ 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:





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.

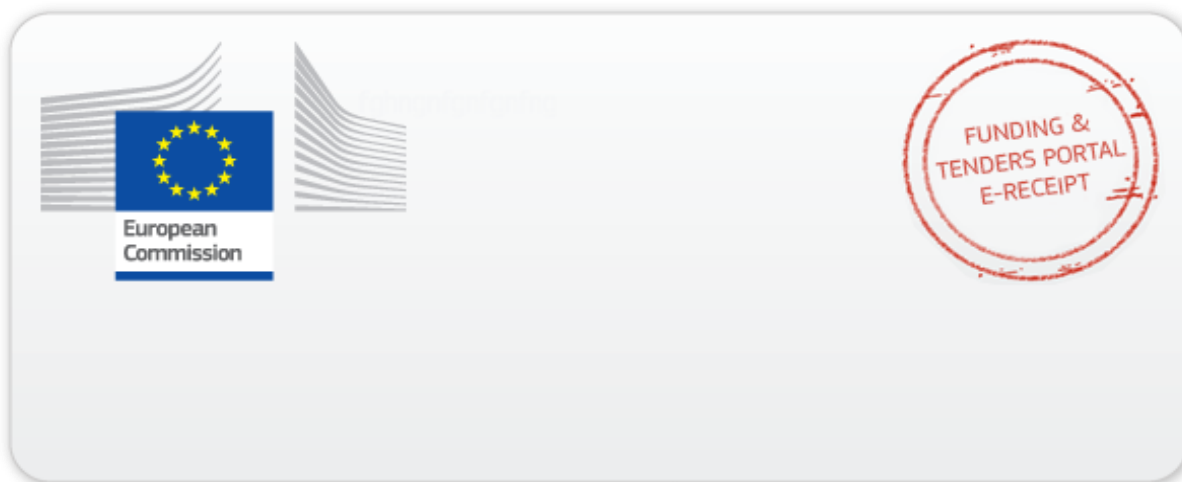
Moreover, where the call conditions impose wholesale access obligations, the beneficiaries must provide wholesale access to the digital infrastructure funded by the action, under fair and reasonable conditions, in a non-discriminatory manner and in accordance with the call conditions.

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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