European Defence Fund (EDF)

Call for proposals

EDF-2024-LS-RA-CHALLENGE

Call for EDF research actions,
in the form of a **technological challenge**,
implemented via lump sum grants

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28 August 2024

HISTORY OF CHANGES			
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1.1	28.08.2024	– Intra-EU transfers of defence related products	35-36
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EUROPEAN COMMISSION
Directorate-General for Defence Industry and Space

DEFIS.A – Defence Industry

CALL FOR PROPOSALS

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0. Introduction

This is a call for proposals for EU **action grants** in the field of collaborative defence research and development under the **European Defence Fund (EDF)**.

The regulatory framework for this EU Funding Programme is set out in:

- Regulation 2018/1046 (EU Financial Regulation)
- the basic act (EDF Regulation 2021/697[1]).

The call is launched in accordance with the Work Programme 2024 - Part II[2] and will be managed by the **European Commission, Directorate-General for Defence Industry and Space (DG DEFIS)**.

⚠ Please be aware that, if selected, the Commission may decide that some projects are afterwards managed by entrusted entities such as, but not limited to, the European Defence Agency (EDA) or the Organisation Conjointe de Coopération en Matière d'Armement/Organisation for Joint Armament Co-operation (OCCAR).

This call aims at progressing technologies through the organisation of technological challenges, whereby different research teams address a given technological objective using a common testing environment set up for that purpose. Such an organisation is needed to measure the performances of systems involving artificial intelligence (AI) and machine learning in an objective and comparative way, by relying on independent third parties and on the following processes:

- For each AI-based information processing task, common evaluation protocols are defined and agreed upon by all stakeholders, enabling the organising third party to produce a test dataset while the participating teams develop their systems, that will be run on this dataset. The system outputs are then scored using the agreed evaluation metrics. In order to foster progress, the data remain available to the participating teams for a full analysis of the results, and a debriefing workshop is organised to share this analysis.

- For robotic and autonomous systems, in addition to such data-based tests, field tests are organised to evaluate the complete systems. Such field tests offer the opportunity to collect sensor data that can feed further data-based tests. This creates a virtuous circle where enhanced information processing modules lead to more realistic behaviours during field tests, which enables to collect more representative data that can be used to develop enhanced processing modules.

Such test campaigns typically last about a year. They are generally repeated over several years to compare results and thus measure progress between successive campaigns.

Such an organisation requires careful planning and a tight coordination among stakeholders but is instrumental in steering R&D and fostering progress of AI-based technologies.

This call addresses two technological challenges:

- EDF technological challenge on **robust autonomous drone navigation** (RADN): This challenge aims at progressing the autonomous navigation capabilities of unmanned aerial vehicles and systems in non-permissive environments.

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[1] Regulation (EU) 2021/697 of the European Parliament and of the Council of 29 April 2021 establishing the European Defence Fund and repealing Regulation (EU) 2018/1092 (OJ L 170, 12.5.2021).
[2] Commission Implementing Decision C(2024) 1702 final of 15.04.2024 on the financing of the European Defence Fund established by Regulation (EU) No 2021/697 of the European Parliament and the Council and the adoption of the work programme for 2024 - Part II.

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– <u>EDF technological challenge on **multi-source satellite image analysis** (MSIA)</u>: This challenge aims at progressing satellite image analysis technologies for defence applications, in particular by exploiting the complementary of optical and radar imagery. It addresses multisource image analysis technologies for which progress is needed. These technologies should be integrated into demonstrators that can be tested by representative defence users on their own data.

Technological challenges involve database creation and technology evaluation activities that require specific support. Under the EDF, this leads to two topics per technological challenge, one to support the research teams participating in the challenge, and one to support the challenge organisers.

The call covers the following **topics**:

– **EDF-2024-LS-RA-CHALLENGE-SENS-RADNP: Multi-sensor integration for robust autonomous drone navigation — Participation in a technological challenge**

– **EDF-2024-LS-RA-CHALLENGE-SENS-RADNO: Multi-sensor integration for robust autonomous drone navigation — Organisation of a technological challenge**

– **EDF-2024-LS-RA-CHALLENGE-SPACE-MSIAP: Multi-sensor satellite imagery analysis — Participation in a technological challenge**

– **EDF-2024-LS-RA-CHALLENGE-SPACE-MSIAO: Multi-sensor satellite imagery analysis — Organisation of a technological challenge**

For each technological challenge, a preliminary evaluation plan common to the two topics is provided as part of the call document (see Annexes 4a and 4b). It is an integral part of the topic description for each of these two topics.

Each project application under the call must address only one of these topics. However, **it is highly recommended that applicants read both topics and the preliminary evaluation plan related to a given technological challenge before preparing their application** in order to fully understand the overall set-up. Applicants wishing to apply for more than one topic, must submit a separate proposal under each topic.

The two topics of a technological challenge are linked. Actions selected for the participation in a challenge will be linked to the action selected for its organisation, via the 'linked action' mechanism described in the Model Grant Agreement.

We invite you to read the **call documentation** carefully, and in particular this Call Document, the Model Grant Agreement, the <u>EU Funding & Tenders Portal Online Manual</u> and the <u>EU Grants AGA — Annotated Grant Agreement</u>.

These documents provide clarifications and answers to questions you may have when preparing your application:

– the <u>Call Document</u> outlines the:

– background, type of action and funding rate, objectives, scope and types of activities, functional requirements, expected impact and specific topic conditions (sections 1 and 2)

– timetable and available budget (sections 3 and 4)

– admissibility and eligibility conditions, including mandatory documents (sections 5 and 6)

– criteria for financial and operational capacity and exclusion (section 7)

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- evaluation and award procedure (section 8)

- award criteria (section 9)

- legal and financial set-up of the Grant Agreements (section 10)

- how to submit an application (section 11)

- the Online Manual outlines the:

  - procedures to register and submit proposals online via the EU Funding & Tenders Portal ('Portal')

  - recommendations for the preparation of the application

- the AGA — Annotated Grant Agreement contains:

  - detailed annotations on all the provisions in the Grant Agreement you will have to sign in order to obtain the grant *(including cost eligibility, payment schedule, accessory obligations, etc.)*.

You are also encouraged to visit the [DG DEFIS webpage](#) to consult the list of projects funded previously.

1. Background

The European Defence Fund (EDF) fosters the competitiveness, efficiency and innovation capacity of the European defence technological and industrial base (EDTIB).

It contributes to the EU strategic autonomy and its freedom of action, by supporting collaborative actions and cross-border cooperation between legal entities throughout the Union, in particular SMEs and mid-caps, as well as by strengthening and improving the agility of both defence supply and value chains, widening cross-border cooperation between legal entities and fostering the better exploitation of the industrial potential of innovation, research and technological development, at each stage of the industrial lifecycle of defence products and technologies.

The EDF funds projects which are consistent with the defence capability priorities commonly agreed by EU Member States within the framework of the Common Foreign and Security Policy (CFSP), through:

- collaborative research that could significantly boost the performance of future capabilities, aiming to maximise innovation and introduce new defence products and technologies, including disruptive technologies for defence, and aiming to make the most efficient use of defence research spending in the EU

  or

- collaborative development of defence products and technologies, thus contributing to the greater efficiency of defence spending in the EU, achieving greater economies of scale, reducing the risk of unnecessary duplication and thereby fostering the market uptake of European defence products and technologies and reducing the fragmentation of defence products and technologies, ultimately leading to an increase in the standardisation of defence systems and a greater interoperability between Member States' capabilities.

In line with the Work Programme 2024 - Part II, this call covers thematic topics addressing **research actions for a technological challenge** which will be implemented through lump sum grants.

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Business coaching

The EDF also has a business coaching component. Successful SME beneficiaries will be offered business coaching, to accelerate their growth and guide them in their business challenges to reach the defence market.

2. Type of action and funding rate — Objectives — Scope and types of activities — Functional requirements — Expected impact — Specific topic conditions

Type of action and funding rate

The topics under this call for proposals concern EDF Lump Sum Grants for Research Actions (LS-RA).

Lump Sum Grants for Research Actions are managed as contributions on the basis of an estimated project budget where each activity will be reimbursed at the funding rate that applies to Research Actions (100%).

Specific topic conditions

- For all topics under this call, multi-beneficiary applications are mandatory and specific conditions for the consortium composition apply *(see section 6)*

- For all topics under this call, the following reimbursement option for equipment costs applies: depreciation only *(see section 10).*

EDF-2024-LS-RA-CHALLENGE-SENS-RADNP: Multi-sensor integration for robust autonomous drone navigation — Participation in a technological challenge

Objectives

To fulfil their missions, the next generation of unmanned aerial systems (UAS) are expected to offer an increased level of autonomy. Their effective deployment necessitates key features of swarming and navigation to target positions when GNSS availability is contested or lost and more generally in non-permissive environments. The use of various types of sensors (e.g. inertial, optical, infrared, hyperspectral, radar, LIDAR, acoustic, etc.) and intelligent information fusion are needed to provide the necessary capabilities to tackle these technical and operational challenges. Such intelligent navigation payloads should be usable on a wide range of unmanned assets, including in swarm formations, while having a low SWaP-C (Size, Weight, Power and Costs). Their performances should be measured in a quantitative, objective and comparable way.

Scope and types of activities

Scope

The proposals must address technological solutions for autonomous aerial drone navigation in non-permissive environments. These solutions must be evaluated through the testing environment set up in the framework of the technological challenge.

Types of activities

The following table lists the types of activities which are eligible for this topic, and whether they are mandatory or optional *(see Article 10(3) EDF Regulation)*:

	Types of activities (art 10(3) EDF Regulation)	Eligible?
(a)	Activities that aim to create, underpin and improve knowledge, products and technologies, including disruptive technologies, which can achieve significant effects in the area of defence (**generating knowledge**)	Yes (mandatory)
(b)	Activities that aim to increase interoperability and resilience, including secured production and exchange of data, to master critical defence technologies, to strengthen the security of supply or to enable the effective exploitation of results for defence products and technologies (**integrating knowledge**)	Yes (optional)
(c)	**Studies**, such as feasibility studies to explore the feasibility of new or upgraded products, technologies, processes, services and solutions	Yes (optional)
(d)	**Design** of a defence product, tangible or intangible component or technology as well as the definition of the technical specifications on which such a design has been developed, including any partial test for risk reduction in an industrial or representative environment	Yes (optional)
(e)	**System prototyping**[3] of a defence product, tangible or intangible component or technology	No
(f)	**Testing** of a defence product, tangible or intangible component or technology	No
(g)	**Qualification**[4] of a defence product, tangible or intangible component or technology	No
(h)	**Certification**[5] of a defence product, tangible or intangible component or technology	No
(i)	Development of technologies or assets **increasing efficiency** across the life cycle of defence products and technologies	No

Accordingly, the proposals must cover at least the following tasks as part of mandatory activities:

– Generating knowledge:

– Research on new approaches for robust autonomous navigation of unmanned aerial vehicles and systems in non-permissive environments.

– Participation to the evaluation campaigns organised in the framework of the technological challenge, including:

– contribution to the exchanges with the other stakeholders for elaborating the evaluation plans;

– participation of the unmanned aerial systems and software modules in experimental field and data-based test campaigns

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[3] 'System prototype' means a model of a product or technology that can demonstrate performance in an operational environment.

[4] 'Qualification' means the entire process of demonstrating that the design of the product, component or technology meets the specified requirements, providing objective evidence by which particular requirements of a design are demonstrated to have been met.

[5] 'Certification' means the process by which a national authority certifies that the product, component or technology complies with the applicable regulations.

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managed by the challenge organisers, whereby performance measurements are conducted to assess navigation capabilities;

– collection and sharing of sensor data;

– participation to debriefing workshops.

The proposals should substantiate synergies and complementarities with foreseen, ongoing or completed activities in the field of autonomous drone navigation.

Functional requirements

The proposed technologies should meet the following functional requirements:

– The unmanned aerial vehicles and systems should be able to accurately estimate their positions and to go to a designated target area with high reliability in non-permissive environments, where GNSS signals and communications may be degraded or lost.

– The performances for these abilities should be measured through the test campaigns conducted in the framework of the technological challenge, using protocols and metrics based on those described in the preliminary evaluation plan provided as part of the call documents. Details about how the proposed approaches and systems will address the tasks outlined in the preliminary evaluation plan should be described in the proposals. Any relevant system performances measured in the context of previous technological challenges should be mentioned in the proposals.

– Systems should be able to record the data acquired through their sensors to enable full replay of flights and reproduction of experiments in a software environment. The types of data that can be shared with other teams should be described in the proposals.

– The proposed approaches should be relevant for future integration and operational missions, especially in terms of SWaP-C. The user interfaces should help users and in particular pilots to understand and anticipate the system behaviours.

Expected impact

The outcome should contribute to:

– enhanced UAS capabilities with highly autonomous operation modes for EU Member States armed forces, contributing to collaborative combat and tactical cloud capabilities;

– competitiveness, efficiency, and innovation capacity of the European defence technological and industrial base, which contributes to the Union strategic autonomy and its freedom of action.

EDF-2024-LS-RA-CHALLENGE-SENS-RADNO: Multi-sensor integration for robust autonomous drone navigation — Organisation of a technological challenge

Objectives

The proposals must address the organisation of a technological challenge on autonomous drone navigation in non-permissive environments based on the preliminary evaluation plan provided as part of the call documents (cf. Annex 4a). This

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includes the collection of data recorded by the participating teams during field tests, the annotation of this data, and the sharing of the resulting databases.

Scope and types of activities

Scope

The proposals should address the organisation of a technological challenge on HLT based on the preliminary evaluation plan provided as part of the call document (cf. Annex 4a). This includes the collection, annotation and distribution of data, and the writing of the evaluation plans.

Types of activities

The following table lists the types of activities which are eligible for this topic, and whether they are mandatory or optional *(see Article 10(3) EDF Regulation)*:

	Types of activities (art 10(3) EDF Regulation)	**Eligible?**
(a)	Activities that aim to create, underpin and improve knowledge, products and technologies, including disruptive technologies, which can achieve significant effects in the area of defence (**generating knowledge**)	Yes (optional)
(b)	Activities that aim to increase interoperability and resilience, including secured production and exchange of data, to master critical defence technologies, to strengthen the security of supply or to enable the effective exploitation of results for defence products and technologies (**integrating knowledge**)	Yes (mandatory)
(c)	**Studies**, such as feasibility studies to explore the feasibility of new or upgraded products, technologies, processes, services and solutions	Yes (optional)
(d)	**Design** of a defence product, tangible or intangible component or technology as well as the definition of the technical specifications on which such a design has been developed, including any partial test for risk reduction in an industrial or representative environment	Yes (optional)
(e)	**System prototyping**[6] of a defence product, tangible or intangible component or technology	No
(f)	**Testing** of a defence product, tangible or intangible component or technology	No
(g)	**Qualification**[7] of a defence product, tangible or intangible component or technology	No
(h)	**Certification**[8] of a defence product, tangible or intangible component or technology	No
(i)	Development of technologies or assets **increasing efficiency** across the life cycle of defence products and technologies	No

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[6] 'System prototype' means a model of a product or technology that can demonstrate performance in an operational environment.

[7] 'Qualification' means the entire process of demonstrating that the design of the product, component or technology meets the specified requirements, providing objective evidence by which particular requirements of a design are demonstrated to have been met.

[8] 'Certification' means the process by which a national authority certifies that the product, component or technology complies with the applicable regulations.

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Accordingly, the proposals must cover at least the following tasks as part of mandatory activities:

– Integrating knowledge:

  – Setting up of the hardware and software infrastructures for testing autonomous navigation technologies in the framework of the technological challenge.

  – Collection of sensor data from the participating teams, labelling/annotation of the data with the expected outputs against which the system outputs will be evaluated ("ground truth") or establishment of such expected outputs as needed, and quality assessment, distribution, and curation of databases.

  – Organisation of the evaluation campaigns, and in particular:

    – coordination of the exchanges with the other stakeholders on the evaluation plans and elaboration of these plans;

    – management of the field and data-based test campaigns and of the objective measurements of the performances of the systems submitted to the tests by the participating teams according to the protocols and metrics described in the evaluation plans;

    – organisation of the debriefing workshops.

The proposals should substantiate synergies and complementarities with foreseen, ongoing or completed activities for the objective and comparative evaluation of the performances of autonomous navigation technologies.

Functional requirements

The proposed solutions should enable to measure the performances of the tested systems according to detailed evaluation plans based on the preliminary evaluation plan provided as part of the call documents (see Annex 4a). Key aspects of the foreseen detailed evaluation plans and associated data management should be described in the proposals.

Proposals should in particular describe:

– the scenarios, nature and size of the test ranges, and the environmental conditions;

– the set up for establishing the reference positions of drones during field tests and the expected positioning accuracy;

– the nature and volume of data annotation;

– the quality control of the annotations;

– the framework for trusted sharing of data;

– the detailed programme of the data-based and field test campaigns;

– the evaluation procedures (rules and tools to implement the metrics) and significance tests to be performed on measurements.

The proposed scenarios should be representative of a wide range of situations encountered in military operations, including communications and GNSS loss, possibly

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due to jamming and spoofing attacks.

Trust should be ensured in the quality of the data annotation. Part of the data should be subject to double annotation by two independent annotators and the inter-annotator agreement should be analysed. The statistical significance of the measured results should be estimated.

The detailed programme of the field test campaigns should be based on the hypothesis that at least four teams will participate. The possibility to accommodate for additional participants beyond this baseline and the impact on the field test programme should be described in the proposals.

During the challenge, drafts of the detailed evaluation plans should be submitted for discussion to the participating teams and to any stakeholder designated by the funding authority, early enough to take into account the feedback for the actual evaluation campaigns. Any evolution of the evaluation plans should take into account several factors: technical possibilities and costs, scientific relevance of the measurement, and representativeness of the metrics and protocols with respect to military needs. The justification of any change that is not subject to a consensus should be documented.

Expected impact

The outcome should contribute to:

- collaboration, knowledge sharing, and new partnerships that drive collective progress in autonomous drone navigation at the EU level;

- improved knowledge and understanding on the capabilities of European industry to integrate sensors in UAS;

- improved technologies for autonomous navigation of drone swarms, and more generally improved performance of combat drones;

- certification of technologies for autonomous drone navigation;

- improved capabilities of the European Member State armed forces to prepare the use of drones in difficult environments involving GNSS jamming, communications jamming, and various obstacles.

EDF-2024-LS-RA-CHALLENGE-SPACE-MSIAP: Multi-source satellite imagery analysis – Participation in a technological challenge

Objectives

General objective

Imagery analysis and in particular satellite image analysis is an important component of defence intelligence. It enables to gather strategic and operational information on facilities, vehicles and forces on the ground and on the seas with a good geographic coverage across the Earth, and to assess the status of suspicious or hostile activities.

Satellite imagery analysis has long relied on traditional techniques, but the ever-increasing amounts of available satellite images has led to a need for automated analysis technologies. These technologies have been the subject of much research over several decades, and the steady progress of artificial intelligence (AI) and in particular of AI-based image recognition has led to new tools appearing on the market. However, much of the development work and technological challenges in this field have focused on image types other than satellite images, and there is a need to foster the progress of satellite image analysis technologies. In this context, the general objective of this call topic is to enhance these technologies by giving research teams the opportunity to

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benefit from the organisation of a technological challenge dedicated to them.

Specific objective

Optical and radar images of a given geographic area contain complementary information. While these different types of images result from very different physical principles, which make their combination quite challenging, such a combination can lead to improved information extraction and capabilities. This call topic therefore aims at progressing information fusion approaches towards this objective.

Scope and types of activities

Scope

The proposals must address technological solutions to detect, identify and characterise relevant information from multi-source satellite images, in particular by taking advantage of the complementarity of optical and radar images. These technological solutions must be evaluated in the framework of the technological challenge organised under this call. Technologies should be integrated into demonstrators that can be tested by representative defence users on their own data.

Types of activities

The following table lists the types of activities which are eligible for this topic, and whether they are mandatory or optional *(see Article 10(3) EDF Regulation)*:

	Types of activities (art 10(3) EDF Regulation)	Eligible?
(a)	Activities that aim to create, underpin and improve knowledge, products and technologies, including disruptive technologies, which can achieve significant effects in the area of defence (**generating knowledge**)	Yes (mandatory)
(b)	Activities that aim to increase interoperability and resilience, including secured production and exchange of data, to master critical defence technologies, to strengthen the security of supply or to enable the effective exploitation of results for defence products and technologies (**integrating knowledge**)	Yes (optional)
(c)	**Studies**, such as feasibility studies to explore the feasibility of new or upgraded products, technologies, processes, services and solutions	Yes (optional)
(d)	**Design** of a defence product, tangible or intangible component or technology as well as the definition of the technical specifications on which such a design has been developed, including any partial test for risk reduction in an industrial or representative environment	Yes (optional)
(e)	**System prototyping**[9] of a defence product, tangible or intangible component or technology	No
(f)	**Testing** of a defence product, tangible or intangible component or technology	No
(g)	**Qualification**[10] of a defence product, tangible or intangible component or technology	No

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[9] 'System prototype' means a model of a product or technology that can demonstrate performance in an operational environment.

[10] 'Qualification' means the entire process of demonstrating that the design of the product, component or technology meets the specified requirements, providing objective evidence by which particular requirements of a design are demonstrated to have been met.

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	Types of activities (art 10(3) EDF Regulation)	Eligible?
(h)	**Certification[11]** of a defence product, tangible or intangible component or technology	No
(i)	Development of technologies or assets **increasing efficiency** across the life cycle of defence products and technologies	No

Accordingly, the proposals must cover at least the following tasks as part of mandatory activities:

– Generating knowledge:

– Research on satellite image analysis technologies.

– Participation to the evaluation campaigns organised in the framework of the technological challenge, including:

– exchanges with other stakeholders on the evaluation plans;

– participation to the test campaigns whereby the performances of the technological modules are measured on the test data provided by the challenge organisers;

– participation to debriefing workshops.

In addition, the proposals should cover the following tasks:

– Integrating knowledge:

– Integration of technological modules into demonstrators that can be tested by representative defence users.

The proposals should substantiate synergies and complementarities with foreseen, ongoing or completed activities in the field of satellite imagery analysis, notably those that may be performed in the context of the EDIDP (e.g. under the call topic EDIDP-ISR-PEO-2019[12]), the EDF (e.g. under the call topics EDF-2021-DIGIT-R-FL[13] on *Frugal learning for rapid adaptation of AI systems*, EDF-2022-RA-DIGIT-DBIR[14] on *Shared databases and integrated systems for image recognition*, EDF-2022-DA-SPACE-ISR[15] on *Innovative multi-sensor space-based Earth observation capabilities towards persistent and reactive ISR*, or EDF-2024-RA-DIGIT-ASMEP on *Automated Structural Modelling for Effect Prediction*), the EU Space programme (e.g. feasibility studies on potential EU Earth-observation services for governmental use[16]), Horizon Europe or within the European Defence Agency (EDA) (e.g. the Capability Technology Group on Space activities[17]).

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[11] 'Certification' means the process by which a national authority certifies that the product, component or technology complies with the applicable regulations.
[12] Funding & tenders (europa.eu)
[13] Funding & tenders (europa.eu)
[14] Funding & tenders (europa.eu)
[15] Funding & tenders (europa.eu)
[16] https://etendering.ted.europa.eu/cft/cft-display.html?cftId=13224
[17] https://eda.europa.eu/what-we-do/all-activities/activities-search/ad-hoc-working-group-space

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The proposals should include clear descriptions of the proposed criteria to assess work package completion. Criteria should include the completion of the tests performed in each evaluation campaign.

Functional requirements

The proposed solutions should meet the following functional requirements:

− Technological modules addressing the tasks defined in the framework of the challenge should be developed and submitted for evaluation (cf. preliminary evaluation plan).

− These technological modules should be integrated into demonstrators with a user-friendly interface. Any difference between the version evaluated through the challenge and a version integrated in the demonstrator should be documented.

− The demonstrators should be able to run locally, without a connection to a wide area network, and with reasonable resources in term of hardware size, weight, price, and energy consumption.

− The technological modules should be easy to configure and integrate into defence systems beyond the demonstrators produced in the framework of the challenge. They should follow as much as possible the relevant standards, best practices and guidelines, including those elaborated at the challenge level, in particular for input and output formats.

Expected impact

The outcome should contribute to:

− an enhanced exploitation of satellite images, by automating the workflow of imagery intelligence production and enabling analysts to focus on value-added tasks;

− the EU technological edge and autonomy for defence-related satellite imagery analysis.

EDF-2024-LS-RA-CHALLENGE-SPACE-MSIAO: Multi-source satellite imagery analysis – Organisation of a technological challenge

Objectives

The objective evaluation of artificial intelligence (AI) technologies, such as those used for satellite image analysis, requires a specific organisation whereby systems are tested on datasets that are new to the systems (blind testing), but that are representative of the tasks under study, and using common protocols. This scheme is commonly referred to as a "technological challenge". One objective of the call is to organise a technological challenge driving research toward enhanced satellite image analysis for defence applications, and in particular for the combined analysis of optical and radar images. While a few challenges on satellite image analysis are organised in other contexts, there is a need for evaluations focusing on defence use cases, and for large datasets with annotations enabling accurate performance measurements.

Scope and types of activities

Scope

The proposals must address the organisation of a technological challenge on multi-source satellite image analysis based on the preliminary evaluation plan provided as

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part of the call document (see Annex 4b). This includes the collection, annotation and distribution of data, and the writing of the evaluation plans. The proposals must also address the possibility to involve representative defence users testing the demonstrators produced by the participating teams and providing feedback.

The following use cases should be considered when elaborating the evaluation plans:

– Target analysis: vehicle functional status recognition, target identification and early target detection, classification and recognition.

– Monitoring and tracking: change in detection, camps, oil tank volume estimation, non-linear tracking of targets, routes.

– Searching: disturbed terrain detection, vehicle trails or moving targets detection, camouflage and material detection, minefield detection.

– Mapping: terrain modelling (ground, water, roads, constructions), trafficability analysis and obstacle detection, coastal bathymetry for shallow waters.

– Damage assessment: battle damage assessment, detection of climate/environment disaster-affected areas impacting defence operations.

Both optical and radar images must be considered. They may include the following:

Optical

– Standard (i.e., in the visible part of the EM spectrum) panchromatic and/or multispectral images with various spatial resolutions below or above 1 metre depending on the selected use-cases, based on commercial, dual-use or defence systems.

– Hyperspectral images with various spatial resolutions below 50m, based on scientific, commercial, dual-use or defence systems.

– Infrared images.

This may include multi-view stereo or video modes where available.

Radar

– X-band SAR images (amplitude and phase, different polarisation) with various resolutions below or above 1 metre depending on the selected use-cases, based on commercial, dual-use or defence systems.

– C or S-band SAR images.

– P or L-band SAR images.

The use of optical and radar aerial imagery may also be considered, in particular to test systems on high-resolution images for certain types of images (e.g. hyperspectral or infrared, simulation of higher resolution images).

Metadata that would normally be used in operational scenarios should be provided.

The actual types of images and metadata to be used for the challenge should be described in the proposals.

Types of activities

The following table lists the types of activities which are eligible for this topic, and whether they are mandatory or optional *(see Article 10(3) EDF Regulation)*:

	Types of activities (art 10(3) EDF Regulation)	Eligible?
(a)	Activities that aim to create, underpin and improve knowledge, products and technologies, including disruptive technologies, which can achieve significant effects in the area of defence (**generating knowledge**)	Yes (optional)
(b)	Activities that aim to increase interoperability and resilience, including secured production and exchange of data, to master critical defence technologies, to strengthen the security of supply or to enable the effective exploitation of results for defence products and technologies (**integrating knowledge**)	Yes (mandatory)
(c)	**Studies**, such as feasibility studies to explore the feasibility of new or upgraded products, technologies, processes, services and solutions	Yes (optional)
(d)	**Design** of a defence product, tangible or intangible component or technology as well as the definition of the technical specifications on which such a design has been developed, including any partial test for risk reduction in an industrial or representative environment	Yes (optional)
(e)	**System prototyping**[18] of a defence product, tangible or intangible component or technology	No
(f)	**Testing** of a defence product, tangible or intangible component or technology	No
(g)	**Qualification**[19] of a defence product, tangible or intangible component or technology	No
(h)	**Certification**[20] of a defence product, tangible or intangible component or technology	No
(i)	Development of technologies or assets **increasing efficiency** across the life cycle of defence products and technologies	No

Accordingly, the proposals must cover at least the following tasks as part of mandatory activities:

–   Integrating knowledge:

–   Setting up of the infrastructures for testing satellite image analysis systems in the framework of the technological challenge.

–   Production of data annotation guidelines, collection and annotation of data, quality assessment, distribution and curation of databases.

–   Organisation of the evaluation campaigns, and in particular:

–   Coordination of the exchanges with other stakeholders on the data annotation guidelines and evaluation plans, and elaboration of these documents;

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[18]   'System prototype' means a model of a product or technology that can demonstrate performance in an operational environment.

[19]   'Qualification' means the entire process of demonstrating that the design of the product, component or technology meets the specified requirements, providing objective evidence by which particular requirements of a design are demonstrated to have been met.

[20]   'Certification' means the process by which a national authority certifies that the product, component or technology complies with the applicable regulations.

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- Management of the experimental test campaigns, including the objective measurements of the performances of the technological modules submitted to the tests by the participating teams according to the protocols and metrics described in the evaluation plans;

- Organisation of the debriefing workshops

The proposals should include clear descriptions of the proposed criteria to assess work package completion. Criteria should include the production of detailed evaluation plans agreed upon by all stakeholders, the production of the annotated databases needed for the evaluations, the production of measurements for all systems submitted to the tests by the participating teams following these plans, and the organisation of the needed events.

Functional requirements

The proposed solutions should enable the measurement of the performances of satellite image analysis systems according to detailed evaluation plans based on the preliminary evaluation plan provided as part of this call document (see Annex 4b). Key aspects of the foreseen detailed evaluation plans and associated data management should be described in the proposals.

Proposals should in particular describe:

- the detailed use cases to be addressed and the nature and size of image data to collect;

- the nature and volume of data annotation to be produced, the order of magnitude of the number of different semantic classes, object types and characteristics considered for annotations, and the granularity of these classes with examples;

- a framework for trusted sharing of data during the challenge and beyond;

- a detailed plan of the test campaigns and an overall timeline/Gantt chart of the challenge;

- the evaluation procedures (rules and tools to implement the metrics) and significance tests to be performed on measurements.

A user board consisting of representative defence users should be set up and involved in the preparation of the evaluation plans and of the data. Data should be representative of use cases of interest for defence. Proposals should describe the foreseen efforts from users to test demonstrators and provide feedback.

Data may be annotated in a semi-automatic way. Agreements may be sought with participants to use automatic tools developed by them. All annotations should be manually checked. To assess the relevance and accuracy of the data annotations, at least part of the data should be annotated by two independent annotators. The two sets of annotations should be compared to each other using the same metrics as for the evaluation of system outputs. An analysis of this inter-annotator agreement should be presented during the evaluation campaign workshops.

During the challenge, a detailed evaluation plan should be prepared for each evaluation campaign. Drafts of these detailed evaluation plans should be submitted for discussion to the participating teams, early enough to take into account feedback and leave time for system development before the actual test campaigns. Any evolution of the evaluation plans should take into account several factors: technical possibilities and

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cost, scientific relevance of the measurement, and representativeness of the metrics and protocols with respect to military needs. The justification of any change that is not subject to a consensus should be documented.

The user board and the participating teams should be involved in the steering of the challenge. Proposals should include a clear description of the foreseen governance and decision-making processes.

Expected impact

The outcome should contribute to:

–   Collaboration, knowledge sharing, and new partnerships that drive collective progress in AI solution development for defence imagery analysis at the EU level;

–   The development of policies and potential standards for AI in defence imagery analysis, enhancing interoperability across EU Member States;

–   An enhanced cost-effectiveness of systems, optimising resource utilisation and reducing operational expenses.

3. Available budget

The estimated available call budget is **EUR 52 000 000**.

Specific budget information per topic can be found in the table below:

Topic	Topic budget	Fixed maximum number of projects
EDF-2024-LS-RA-CHALLENGE-SENS-RADNP: Multi-sensor integration for robust autonomous drone navigation – Participation in a technological challenge	**EUR 20 000 000**	No
EDF-2024-LS-RA-CHALLENGE-SENS-RADNO: Multi-sensor integration for robust autonomous drone navigation – Organisation of a technological challenge	**EUR 7 000 000**	1
EDF-2024-LS-RA-CHALLENGE-SPACE-MSIAP: Multi-source satellite imagery analysis – Participation in a technological challenge	**EUR 15 000 000**	No
EDF-2024-LS-RA-CHALLENGE-SPACE-MSIAO: Multi-source satellite imagery analysis – Organisation of a technological challenge	**EUR 10 000 000**	1

We reserve the right not to award all available funds or to redistribute them between the call priorities (i.e. topics), depending on the proposals received and the results of the evaluation.

4. Timetable and deadlines

Timetable and deadlines (indicative)

Call opening:	20 June 2024
Deadline for submission:	5 November 2024 – 17:00:00 CET (Brussels)
Evaluation:	November 2024 - May 2025
Information on evaluation results:	May 2025
GA signature[21]:	May - December 2025

5. Admissibility and documents

Proposals must be submitted before the **call deadline** *(see timetable section 4)*.

Proposals must be submitted **electronically** via the Funding & Tenders Portal Electronic Submission System (accessible via the Topic page in the Search Funding & Tenders section). Paper submissions are NOT possible.

Proposals (including annexes and supporting documents) must be submitted using the forms provided *inside* the Submission System (⚠ NOT the documents available on the Topic page — they are only for information).

Proposals must be **complete** and contain all the requested information and all required annexes and supporting documents:

- Application Form Part A — contains administrative information about the participants (future coordinator, beneficiaries and affiliated entities), the ethics issues table and the summarised budget for the project *(to be filled in directly online)*

- Application Form Part B — contains the technical description of the project *(to be downloaded from the Portal Submission System, completed and then assembled and re-uploaded)*

- mandatory annexes and supporting documents *(templates available to be downloaded from the Portal Submission System, completed, assembled and re-uploaded together with Application Form Part B)*:

    - detailed budget table (EDF LS RA)

    - participant information (including previous projects, if any)

    - list of infrastructure, facilities, assets and resources

    - actual indirect cost methodology declarations (if actual indirect costs used)

    - ownership control declarations (including for associated partners and subcontractors involved in the action)

Please be aware that since the detailed budget table serves as the basis for fixing the lump sums for the grants (and since lump sums must be reliable proxies for the actual costs of a project), the costs you include MUST comply with the basic eligibility conditions for EU actual cost grants *(see AGA — Annotated Grant Agreement, art 6)*. This is particularly important for purchases and subcontracting, which must comply with best value for money (or if appropriate the lowest price) and be free of any conflict of interests. If the budget table contains ineligible costs, the grant may be reduced (even later on during the project implementation or after their end).

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[21] In case of management by an entrusted entity, this timeframe may be different.

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Please note that the amounts entered into the summarised budget table (filled in directly online) must correspond to the amounts calculated in the detailed budget table. In case of discrepancies, the amounts in the online summarised budget table will prevail.

At proposal submission, you will have to confirm that you have the **mandate to act** for all applicants. Moreover, you will have to confirm that the information in the application is correct and complete and that the participants comply with the conditions for receiving EU funding (especially eligibility, financial and operational capacity, exclusion, etc.). Before signing the grant, each beneficiary and affiliated entity will have to confirm this again by signing a declaration of honour (DoH). Proposals without full support will be rejected.

Your application must be **readable**, **accessible and printable**.

Proposals (Part B) are limited to maximum **100 pages**, counting the work package descriptions. Evaluators will not consider any additional pages.

You may be asked at a later stage for further documents *(for legal entity validation, financial capacity check, bank account validation, etc.)*.

For more information about the submission process (including IT aspects), consult the Online Manual.

6. Eligibility

Eligible participants (eligible countries)

In order to be eligible, the applicants (beneficiaries and affiliated entities) must:

- be legal entities (public or private bodies)

- be established in one of the eligible countries, i.e.:

    - EU Member States (including overseas countries and territories (OCTs))

    - non-EU countries :

        - listed EEA countries ('EDF associated countries', *see list of participating countries*)

- have their executive management structure established in eligible countries

- must not be subject to control by a non-associated third country or non-associated third-country entity (unless they can provide guarantees – *see Annex 2* - approved by the Member State or EDF associated country where they are established)

Beneficiaries and affiliated entities must register in the Participant Register — before submitting the proposal — and will have to be validated by the Central Validation Service (REA Validation). For the validation, they will be requested to upload documents showing legal status and origin.

Other entities may participate in other roles, such as associated partners, subcontractors, third parties giving in-kind contributions, etc. *(see section 13)*.

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⚠ Please note that, in EDF, subcontractors involved in the action[22] and associated partners must also comply with the above-listed conditions concerning establishment and control.

Associated partners which are not established in one of the eligible countries (or which are subject to control by a non-associated third country or non-associated third-country entity) may however participate exceptionally if certain conditions are fulfilled *(not contravene EU and MS security and defence interests; consistent with EDF objectives; results not subject to control or restriction by non-associated third countries or non-associated third-country entities; no unauthorised access to classified information; no potential negative effects over security of supply of inputs which are critical for the project)*, subject to agreement by the granting authority and without any funding under the grant.

Specific cases

Natural persons — Natural persons are NOT eligible (with the exception of self-employed persons, i.e. sole traders, where the company does not have legal personality separate from that of the natural person).

International organisations — International organisations are not eligible, unless they are international organisations whose members are only Member States or EDF associated countries and whose executive management structure is in a Member State or EDF associated country.

Entities without legal personality — Entities which do not have legal personality under their national law may exceptionally participate, provided that their representatives have the capacity to undertake legal obligations on their behalf, and offer guarantees for the protection of the EU financial interests equivalent to that offered by legal persons[23].

Associations and interest groupings — Entities composed of members may participate as 'sole beneficiaries' or 'beneficiaries without legal personality'[24]. ⚠ Please note that if the action will be implemented by the members, they should also participate (either as beneficiaries or as affiliated entities, otherwise their costs will NOT be eligible).

Subcontractors involved in the action — Subcontractors with a direct contractual relationship to a recipient *(i.e. beneficiary or affiliated entity)*, other subcontractors to which at least 10% of the total eligible costs of the action is allocated, and subcontractors which may need access to classified information in order to carry out the action.

Following the Council Implementing Decision (EU) 2022/2506, as of 16th December 2022, no legal commitments (including the grant agreement itself as well as subcontracts, purchase contracts, financial support to third parties, etc.) can be signed with Hungarian public interest trusts established under Hungarian Act IX of 2021 or any entity they maintain. Affected entities may continue to apply to calls for proposals. However, in case the Council measures are not lifted, such entities are not eligible to participate in any funded role (beneficiaries, affiliated entities, subcontractors, recipients of financial support to third parties). In this case, co-applicants will be invited to remove or replace that entity and/or to change its status into associated partner. Tasks and budget may be redistributed accordingly.

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[22] 'Subcontractors involved in the action' means subcontractors with a direct contractual relationship to a beneficiary or affiliated entity, other subcontractors to which at least 10% of the total eligible costs of the action are allocated, and subcontractors which may need access to classified information in order to carry out the project.

[23] See Article 197(2)(c) EU Financial Regulation 2018/1046.

[24] For the definitions, see Articles 187(2) and 197(2)(c) EU Financial Regulation 2018/1046.

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EU restrictive measures — Special rules apply for certain entities *(e.g. entities subject to [EU restrictive measures](#) under Article 29 of the Treaty on the European Union (TEU) and Article 215 of the Treaty on the Functioning of the EU (TFEU)[25] and entities covered by Commission Guidelines No [2013/C 205/05](#)[26])*. Such entities are not eligible to participate in any capacity, including as beneficiaries, affiliated entities, associated partners, subcontractors or recipients of financial support to third parties (if any).

🛈 For more information, *see [Rules for Legal Entity Validation, LEAR Appointment and Financial Capacity Assessment](#)*.

Consortium composition

Proposals must be submitted by minimum 3 independent applicants (beneficiaries; not affiliated entities) from 3 different eligible countries.

Eligible actions and activities

Applications will only be considered eligible if their content corresponds wholly (or at least in part) to the topic description for which it is submitted.

Eligible actions and activities are the ones set out in section 2 above.

⚠️ Please note that the evaluation will also take into account how the proposals address the 'must', 'should' and 'may' requirements included in the subsections 'Scope and types of activities' and 'Functional requirements'. Failing to address a 'must' may give grounds to consider the proposal out of scope; failing to address a 'should' may give grounds for impacting the scoring negatively; addressing a 'may' may give grounds for impacting the scoring positively.

The following actions and activities are not considered as eligible for funding under this call:

- projects that do not implement the objectives set out in Article 3 of the EDF Regulation

- projects that do not concern new defence products or technologies or the upgrade of existing defence products or technologies

- projects that do not relate to at least one of the types of activities set out in Article 10(3) of the EDF Regulation

- projects that do not cover the mandatory types of activities set out in section 2

- projects that concern products and technologies whose use, development or production is prohibited by international law

- projects that concern the development of lethal autonomous weapons without the possibility for meaningful human control over selection and engagement decisions when carrying out strikes against humans (with the exception of the development of early warning systems and countermeasures for defensive purposes).

- projects where background or results:

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[25] Please note that the EU Official Journal contains the official list and, in case of conflict, its content prevails over that of the [EU Sanctions Map](#).

[26] Commission guidelines No [2013/C 205/05](#) on the eligibility of Israeli entities and their activities in the territories occupied by Israel since June 1967 for grants, prizes and financial instruments funded by the EU from 2014 onwards (OJEU C 205 of 19.07.2013, pp. 9-11).

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- would be subject to control or restriction by a non-associated third country or non-associated third-country entity, directly, or indirectly through one or more intermediate legal entities, including in terms of technology transfer

- and, for pre-existing information (background), this would impact the results.

Projects should take into account the results of projects supported by other EU funding programmes. The complementarities must be described in the project proposals (Part B of the Application Form).

Projects must comply with EU policy interests and priorities *(such as environment, social, security, industrial and trade policy, etc.)*.

Financial support to third parties is not allowed under this call.

Geographic location (target countries)

Proposals must relate to activities taking place in the eligible countries *(see above).*

⚠️ Please note that moreover, in EDF, only infrastructure, facilities, assets and resources which are located or held in an eligible country may be used. Other assets, infrastructure, facilities or resources may be used only exceptionally if certain conditions are fulfilled (*no competitive substitutes are readily available; not contravene EU and MS security and defence interests; consistent with EDF objectives; results not subject to control or restriction by non-associated third countries or non-associated third-country entities)*, subject to agreement by the granting authority and without any funding under the grant.

Duration

Project duration:

- for all topics: **48 months**

Projects of longer duration may be accepted in duly justified cases. Extensions are possible, if duly justified and through an amendment.

Project budget

Project budgets (maximum grant amount):

- for the topic EDF-2024-LS-RA-CHALLENGE-SENS-RADNP: **must not exceed EUR 5 000 000**

- for the topic EDF-2024-LS-RA-CHALLENGE-SENS-RADNO: **must not exceed EUR 7 000 000**

- for the topic EDF-2024-LS-RA-CHALLENGE-SPACE-MSIAP: **must not exceed EUR 5 000 000**

- for the topic EDF-2024-LS-RA-CHALLENGE-SPACE-MSIAO: **must not exceed EUR 10 000 000**

This does not however preclude the submission/selection of proposals requesting other amounts. The grant awarded may be lower than the amount requested.

Ethics

Projects must comply with:

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— highest ethical standards (including highest standards of research integrity)

and

— applicable EU, international and national law.

Proposals under this call will have to undergo an ethics review to authorise funding and may be made subject to specific ethics rules (which become part of the Grant Agreement in the form of ethics deliverables, *e.g. ethics committee opinions/notifications/authorisations required under national or EU law*).

For completing the ethics issues table in the Submission System, see *How to complete your ethics self-assessment*.

Security

Projects involving classified information must undergo security scrutiny to authorise *funding* and may be made subject to specific security rules (detailed in a security aspects letter (SAL) which is annexed to the Grant Agreement).

Projects where the Member States of the participating beneficiaries and affiliated entities decide to establish a specific security framework under Article 27(4) of the EDF Regulation, will be subject to this specific security framework and classified foreground information (results) generated by the project will be under the originatorship of these Member States.

If no such specific security framework is set up by the signature of the grant agreement, the security rules will be governed by Commission Decision 2015/444[27] and its implementing rules[28].

These rules provide for instance that:

— projects involving information classified TRES SECRET UE/EU TOP SECRET (or equivalent) can NOT be funded

— classified information must be marked in accordance with the applicable security instructions in the SAL

— information with classification levels CONFIDENTIEL UE/EU CONFIDENTIAL or above (and RESTREINT UE/ EU RESTRICTED, if required by national rules) may be:

— created or accessed only on premises with facility security clearing (FSC) from the competent national security authority (NSA), in accordance with the national rules

— handled only in a secured area accredited by the competent NSA

— accessed and handled only by persons with valid personnel security clearance (PSC) and a need-to-know

— at the end of the grant, the classified information must either be returned or continue to be protected in accordance with the applicable rules

— action tasks involving classified information may be subcontracted only with prior 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

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[27] See Commission Decision 2015/544/EU,Euratom of 13 March 2015 on the security rules for protecting EU classified information (OJ L 72, 17.3.2015, p. 53).

[28] See Article 27(4) EDF Regulation.

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Commission)

— disclosure of classified information to third parties is subject to prior written approval from the granting authority.

Please note that facility security clearing may have to be provided before grant signature. The granting authority will assess the need for clearing in each case and will establish their delivery date during grant preparation. Please note that in no circumstances can we sign any grant agreement until at least one of the beneficiaries in a consortium has facility security clearing.

Further security recommendations may be added to the Grant Agreement in the form of security deliverables *(e.g. create security advisory group, limit level of detail, use fake scenario, exclude use of classified information, etc.)*.

Beneficiaries must ensure that their projects are not subject to third-country/international organisation security requirements that could affect implementation or put into question the award of the grant *(e.g. technology restrictions, national security classification, etc.)*. The granting authority must be notified immediately of any potential security issues.

ⓘ More information on security aspects can be found in Annex 3.

7. Financial and operational capacity and exclusion

Financial capacity

Applicants must have **stable and sufficient resources** to successfully implement the projects and contribute their share. Organisations participating in several projects must have sufficient capacity to implement all these projects.

The financial capacity check will be carried out on the basis of the documents you will be requested to upload in the Participant Register during grant preparation *(e.g. profit and loss account and balance sheet, business plan, audit report produced by an approved external auditor, certifying the accounts for the last closed financial year, etc.)*. The analysis will be based on neutral financial indicators, but will also take into account other aspects, such as dependency on EU funding and deficit and revenue in previous years.

The check will normally be done for all beneficiaries, except:

— public bodies (entities established as public body under national law, including local, regional or national authorities) or international organisations

— if the individual requested grant amount is not more than EUR 60 000.

If needed, it may also be done for affiliated entities.

If we consider that your financial capacity is not satisfactory, we may require:

— further information

— an enhanced financial responsibility regime, i.e. joint and several responsibility for all beneficiaries or joint and several liability of affiliated entities *(see below, section 10)*

— prefinancing paid in instalments

— (one or more) prefinancing guarantees *(see below, section 10)*

or

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- propose no prefinancing

- request that you are replaced or, if needed, reject the entire proposal.

- ❶ For more information, *see Rules for Legal Entity Validation, LEAR Appointment and Financial Capacity Assessment*.

Operational capacity

Applicants must have the **know-how, qualifications** and **resources** to successfully implement the projects and contribute their share (including sufficient experience in projects of comparable size and nature).

This capacity will be assessed together with the 'Implementation' award criterion, on the basis of the competence and experience of the applicants and their project teams, including operational resources (human, technical and other) or, exceptionally, the measures proposed to obtain it by the time the task implementation starts.

If the evaluation of the award criterion is positive, the applicants are considered to have sufficient operational capacity.

Applicants will have to show their capacity via the following information:

- general profiles (qualifications and experiences) of the staff responsible for managing and implementing the project.

- description of the consortium participants (including previous projects, if any).

Additional supporting documents may be requested, if needed to confirm the operational capacity of any applicant.

Public bodies, Member State organisations and international organisations are exempted from the operational capacity check.

Exclusion

Applicants which are subject to an **EU exclusion decision** or in one of the following **exclusion situations** that bar them from receiving EU funding can NOT participate[29]:

- bankruptcy, winding up, affairs administered by the courts, arrangement with creditors, suspended business activities or other similar procedures (including procedures for persons with unlimited liability for the applicant's debts)

- in breach of social security or tax obligations (including if done by persons with unlimited liability for the applicant's debts)

- guilty of grave professional misconduct[30] (including if done by persons having powers of representation, decision-making or control, beneficial owners or persons who are essential for the award/implementation of the grant)

- committed fraud, corruption, links to a criminal organisation, money laundering, terrorism-related crimes (including terrorism financing), child labour or human trafficking (including if done by persons having powers of representation, decision-making or control, beneficial owners or persons who are essential for the award/implementation of the grant)

- shown significant deficiencies in complying with main obligations under an EU procurement contract, grant agreement, prize, expert contract, or similar

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[29] See Articles 136 and 141 of EU Financial Regulation 2018/1046.

[30] Professional misconduct includes: violation of ethical standards of the profession, wrongful conduct with impact on professional credibility, false declarations/misrepresentation of information, participation in a cartel or other agreement distorting competition, violation of IPR, attempting to influence decision-making processes or obtain confidential information from public authorities to gain advantage.

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(including if done by persons having powers of representation, decision-making or control, beneficial owners or persons who are essential for the award/implementation of the grant)

- guilty of irregularities within the meaning of Article 1(2) of EU Regulation 2988/95 (including if done by persons having powers of representation, decision-making or control, beneficial owners or persons who are essential for the award/implementation of the grant)

- 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 (including if done by persons having powers of representation, decision-making or control, beneficial owners or persons who are essential for the award/implementation of the grant).

Applicants will also be rejected if it turns out that[31]:

- during the award procedure they misrepresented information required as a condition for participating or failed to supply that information

- they were previously involved in the preparation of the call and this entails a distortion of competition that cannot be remedied otherwise (conflict of interest).

8. Evaluation and award procedure

The proposals will have to follow the **standard submission and evaluation procedure** (one-stage submission + one-step evaluation).

An **evaluation committee** (assisted by independent outside experts) will assess all applications. Proposals will first be checked for formal requirements (admissibility, and eligibility, *see sections 5 and 6*). Proposals found admissible and eligible will be evaluated (for each budget envelope; *see section 3*) against the operational capacity and award criteria *(see sections 7 and 9)* and then ranked according to their scores.

Priority order for proposals with same scores

For proposals with the same score (within a budget envelope) a **priority order** will be determined according to the following approach:

Successively for every group of *ex aequo* proposals, starting with the highest scored group, and continuing in descending order:

1) Proposals will be prioritised according to the scores they have been awarded for the criterion 'Excellence and potential of disruption'. When these scores are equal, priority will be based on scores for the criterion 'Innovation and technological development'. When these scores are equal, priority will be based on scores for the criterion 'Competitiveness'. When these scores are equal, priority will be based on scores for the criterion 'Creation of new cross-border cooperation'

2) If necessary, any further prioritisation will be based on the number of Member States or EDF associated countries, in which applicants involved in the proposal are established

Evaluation result and grant preparation

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[31] See Article 141 EU Financial Regulation 2018/1046.

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All proposals will be informed about the evaluation result (**evaluation result letter**). Successful proposals will be invited for grant preparation; the other ones will be put on the reserve list or rejected.

⚠️ No commitment for funding — Invitation to grant preparation does NOT constitute a formal commitment for funding. We will still need to make various legal checks before grant award: *legal entity validation, financial capacity, exclusion check, etc.*

Grant preparation will involve a dialogue in order to fine-tune technical or financial aspects of the project and may require extra information from your side. It may also include adjustments to the proposal to address recommendations of the evaluation committee or other concerns. Compliance will be a pre-condition for signing the grant.

If you believe that the evaluation procedure was flawed, you can submit a **complaint** (following the deadlines and procedures set out in the evaluation result letter). Please note that notifications which have not been opened within 10 days after sending will be considered to have been accessed and that deadlines will be counted from opening/access *(see also Funding & Tenders Portal Terms and Conditions)*. Please also be aware that for complaints submitted electronically, there may be character limitations.

⚠️ For projects where the Commission decides on management by the European Defence Agency (EDA), the Organisation Conjointe de Coopération en Matière d'Armement/Organisation for Joint Armament Co-operation (OCCAR) or another entrusted entity, you will receive the evaluation result letter by us and then be invited to sign the grant with the relevant entrusted entity.

Business coaching

The EDF also has a business coaching component. Successful SME beneficiaries will be offered business coaching, to accelerate their growth and guide them in their business challenges to reach the defence market.

9. Award criteria

The **award criteria** for this call are as follows:

1. **Excellence and potential of disruption (5 points)**

    – Excellence of the overall concept and soundness of the proposed approach for the solution, including main ideas, technologies and methodology

    – Compliance of the proposal with the objectives, scope and types of activities, functional requirements and expected impact of the topic as set out in section 2

    – Extent to which the objective and expected outcome of the proposed project differs from (and represents an advantage at strategic, technological or defence operational level over) existing defence products or technologies, or has a potential of disruption in the defence domain

2. **Innovation and technological development (5 points)**

    – Extent to which the proposal demonstrates innovation potential and contains ground-breaking or novel concepts and approaches *(e.g. new products, services or business and organizational models)*, new promising technological improvements, or the application of technologies or concepts previously not applied in the defence sector

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- Integration of existing knowledge and previous or ongoing R&D activities in the defence and/or civil sectors, while avoiding unnecessary duplication

- Extent to which the innovations or technologies developed under the proposal could spin-off to other defence applications and products

3. Competitiveness (5 points)

- Foreseen competitive advantage of the product/technology/solution vis-a-vis existing or planned products/technologies/solutions across the EU and beyond, including consideration given to the balance between performance and cost-efficiency of the solution

- Potential to accelerate the growth of companies throughout the EU, based on an analysis of the EU internal market and the global market place, indicating, to the extent possible, the size and the growth potential of the market it addresses, as well as expected volumes of sales both within and outside of the EU.

- Strength of the IP strategy *(e.g. patents)* associated with the solution to support the competitiveness and growth of the applicant companies

4. EDTIB autonomy (5 points)

- Extent to which the proposed project will contribute to the autonomy of the European Defence Technological and Industrial Base (EDTIB) by increasing the EU's industrial and technological non-dependency from third countries

- Beneficial impact that the proposed activities will have on the strength of the European security of supply, including the creation of a new supply chain

- Extent to which the project outcome will contribute to the defence capability priorities agreed by Member States within the framework of the Common Foreign and Security Policy (CFSP), and in particular in the context of the Capability Development Plan (EDA version releasable to the industry); where appropriate, extent to which the proposal addresses regional or an international priorities which serve the security and defence interests of the EU as determined under the CFSP and do not exclude the possibility of participation of Member States or EDF associated countries

5. Creation of new cross-border cooperation[32] (5 points)

- Extent to which the proposed project will create new cross-border cooperation between legal entities established in Member States or EDF associated countries, in particular SMEs and mid-caps, especially compared to former activities in the technological area of the call topic and taking into account the specificity of the market

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[32] In this section, 'cross-border SMEs or mid-caps' refer to SMEs or mid-caps which are established in Member States or EDF associated countries other than those where the legal entities cooperating within the consortium which are not SMEs or mid-caps are established.

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- Planned future cross-border cooperation between legal entities established in Member States or EDF associated countries and cooperation opportunities created by the proposed activities

- Extent to which SMEs and mid-caps which cooperate cross-border participate substantially, and industrial or technological added value brought by them

6. Implementation (5 points)

- Effectiveness and practicality of the structure of the work plan (work breakdown structure), including timing and inter-relation of the different work packages and their components (illustrated by a Gantt chart, Pert chart or similar)

- Usefulness and comprehensiveness of the milestones and deliverables of the project; coherence and clarity of the criteria for reaching the milestones, which should be measurable, realistic and achievable within the proposed duration

- Appropriateness of the management structures and procedures, including decision-making mechanisms, to the complexity and scale of the project; quality of the risk management, including identification and assessment of the project specific critical risks, which could compromise the achievement of the stated project's objectives and detail of proposed risk treatments *(e.g. mitigation measures)*

- Appropriateness of the allocation of tasks and resources between consortium members, ensuring that all participants have a valid and complementary role; allocation of the work share that ensures a high level of effectiveness and efficiency for carrying out the project.

Award criteria	Minimum pass score	Maximum score	Weighting
Excellence and potential of disruption	n/a	5	2
Innovation and technological development	n/a	5	2
Competitiveness	n/a	5	1
EDTIB autonomy	n/a	5	1
Creation of new cross-border cooperation	n/a	5	2
Implementation	n/a	5	1
Overall weighted (pass) scores	**30**	**45**	N/A

Each award criterion will be scored from 0 to 5 (half-points will be allowed) using the following scale:

0 — The proposal fails to address the criterion or cannot be assessed due to missing or incomplete information.

1 — Poor. The criterion is inadequately addressed, or there are serious inherent weaknesses.

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2 — Fair. The proposal broadly addresses the criterion, but there are significant weaknesses.

3 — Good. The proposal addresses the criterion well, but a number of shortcomings are present.

4 — Very Good. The proposal addresses the criterion very well, but a small number of shortcomings are present.

5 — Excellent. The proposal successfully addresses all relevant aspects of the criterion. Any shortcomings are minor.

Maximum points: 45 points.

There is no minimum pass score for individual criteria.

Overall threshold: 30 points.

Proposals that pass the overall threshold will be considered for funding within the limits of the available budget (i.e. up to the budget ceiling). Other proposals will be rejected.

10. Legal and financial set-up of the Grant Agreements[33]

If you pass evaluation, your project will be invited for grant preparation, where you will be asked to prepare the Grant Agreement together with the EU Project Officer.

This Grant Agreement will set the framework for your grant and its terms and conditions, in particular concerning deliverables, reporting and payments.

The Model Grant Agreement that will be used (and all other relevant templates and guidance documents) can be found on Portal Reference Documents.

Starting date and project duration

The project starting date and duration will be fixed in the Grant Agreement *(Data Sheet, point 1)*. Normally the starting date will be after grant signature. A retroactive starting date can be granted exceptionally for duly justified reasons — but never earlier than the proposal submission date.

Project duration: *see section 6 above*

Milestones and deliverables

The milestones and deliverables for each project will be managed through the Portal Grant Management System and will be reflected in Annex 1 of the Grant Agreement.

The following deliverables will be mandatory for all projects:

- progress reports (every 6 to 12 months, to be agreed during grant agreement preparation)

- a special report[34]

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[33] In case of management by an entrusted entity, these rules may be different.
[34] 'Special report' means a specific deliverable of a research action summarising its results, providing extensive information on the basic principles, the aims, the outcomes, the basic properties, the tests performed, the potential benefits, the potential defence applications and the expected exploitation path of the research towards development, including information on the ownership of IPRs but not requiring the inclusion of IPR information (see art 2(23) EDF Regulation).

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Intra-EU transfer of defence-related products

If the implementation of the action requires the Intra-EU transfer of defence-related products[35] used or generated by the action, the beneficiaries remain fully responsible to plan and implement their action in a way that ensures the exercise of the rights by the granting authority/other EU bodies, in accordance with the Grant Agreement. This includes the possible transfer of defence-related products by the beneficiaries to other EU bodies for checks, reviews, audits and investigations.

Considering the granting authority's obligations towards other EU institutions and bodies, the Commission may need to retransfer such defence-related products to them, notably in the framework of audits performed by the European Court of Auditors (ECA). In such a circumstance, the Commission would duly inform the relevant competent national authorities about the list of the concerned defence-related information prior to the transfer.

Please note that the granting authority will not retransfer the defence-related products to any other-third parties to the grant agreement, unless explicitly authorised in writing by the competent national authorities.

Form of grant, funding rate and maximum grant amount

The grant parameters *(maximum grant amount, funding rate, total eligible costs, etc.)* will be fixed in the Grant Agreement *(Data Sheet, point 3 and art 5)*.

Project budget (maximum grant amount): *see section 6 above.*

The grant will be a lump sum grant. This means that it will reimburse a fixed amount, based on a lump sum or financing not linked to costs. The amount will be fixed by the granting authority on the basis of the estimated project budget and funding rates that depend on the type of activities and participants *(see section 2)*.

Budget categories and cost eligibility rules

The budget categories and cost eligibility rules are fixed in the Grant Agreement *(Data Sheet, point 3, art 6 and Annex 2)*.

Budget categories for this call:

- Lump sum contributions[36]

Specific cost eligibility rules for this call:

- the lump sum amount must be calculated in accordance with the methodology set out in the lump sum decision and using the detailed budget table/calculator provided (if any)

- the lump sum calculation should respect the following conditions:

  - for lump sums based on estimated project budgets: the estimated budget must comply with the basic eligibility conditions for EU actual cost grants *(see AGA — Annotated Grant Agreement, art 6)*, in particular:

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[35] listed in the Common Military List of the EU and in the Annex to Directive 2009/43/EC and falling under the export or transfer control of national authorities.

[36] Decision of 30 November 2021 authorising the use of lump sums for specific actions under the European Defence Fund.

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- personnel costs:

    - average personnel costs (unit cost according to usual cost accounting practices) [37]: Yes

    - SME owner/natural person unit cost [38]: Yes

- subcontracting costs:

    - country restrictions for subcontracting costs: Yes, subcontracted work must be performed in the eligible countries

- travel and subsistence unit cost [39]: No (only actual costs)

- equipment costs:

    - depreciation only

- other cost categories:

    - costs for financial support to third parties: not allowed

    - internally invoiced goods and services (unit cost according to usual cost accounting practices) [40]: Yes

- indirect cost:

    - flat-rate: 25% of the eligible direct costs (categories A-D, except subcontracting costs, financial support to third parties and exempted specific cost categories, i.e. internally invoiced goods and services and PCP procurement costs)

    or

    - actual costs

    ⚠ The indirect cost method selected will be fixed for the project and cannot be changed later on.

- VAT: non-deductible VAT is eligible (but please note that since 2013 VAT paid by beneficiaries that are public bodies acting as public authority is NOT eligible)

- other:

    - in-kind contributions for free are allowed, but cost-neutral, i.e. they cannot be declared as cost

    - kick-off meeting: costs for kick-off meeting organised by the granting authority are eligible (travel costs for maximum 2 persons, return ticket to Brussels and accommodation for one night) only if the meeting takes place after the project starting date set out in the Grant Agreement; the starting date can be changed through an amendment, if needed

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[37] Decision of 27 February 2023 authorising the use of unit costs for staff costs and costs for internally invoiced goods and services for specific actions under the European Defence Programme.

[38] Commission Decision of 20 October 2020 authorising the use of unit costs for the personnel costs of the owners of small and medium-sized enterprises and beneficiaries that are natural persons not receiving a salary for the work carried out by themselves under an action or work programme (C(2020)7715).

[39] Commission Decision of 12 January 2021 authorising the use of unit costs for travel, accommodation and subsistence costs under an action or work programme under the 2021-2027 multi-annual financial framework (C(2021)35).

[40] Decision of 27 February 2023 authorising the use of unit costs for staff costs and costs for internally invoiced goods and services for specific actions under the European Defence Programme.

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- project websites: communication costs for presenting the project on the participants' websites or social media accounts are eligible; costs for *separate* project websites are not eligible

- other ineligible costs: Yes, costs related to the use of assets, infrastructure, facilities or resources located or held outside the eligible countries are not eligible (even if their use was authorised, *see section 6*)

- the lump sum breakdown must comply with the following:

  - the types of activity *(see section 2)* may be broken down into several work packages

  - a work package must cover one type of activity only

  - the funding rate to be used for WP 1 — Project management and coordination must be the one for the type of activity (c) Studies.

- other:

  - eligible cost country restrictions: Yes, only costs/contributions for activities carried out in eligible countries are eligible

Reporting and payment arrangements

The reporting and payment arrangements are fixed in the Grant Agreement *(Data Sheet, point 4 and art 21 and 22)*.

After grant signature, you will normally receive a **prefinancing** to start working on the project (float of normally **55%** of the maximum grant amount; exceptionally less or no prefinancing). The prefinancing will be paid 30 days from entry into force/starting date/financial guarantee (if required) — whichever is the latest.

For projects of more than 18 months, there may be one or more **additional prefinancing payments** linked to a prefinancing report and one or more **interim payments**.

In addition, you will be requested to submit one or more progress reports not linked to payments.

Payment of the balance: At the end of the project, we will calculate your final grant amount. If the total of earlier payments is higher than the final grant amount, we will ask you (your coordinator) to pay back the difference (recovery).

All payments will be made to the coordinator.

⚠️ Please be aware that payments will be automatically lowered if one of your consortium members has outstanding debts towards the EU (granting authority or other EU bodies). Such debts will be offset by us — in line with the conditions set out in the Grant Agreement *(see art 22)*.

Please also note that you are responsible for keeping records on all the work done.

Prefinancing guarantees

If a prefinancing guarantee is required, it will be fixed in the Grant Agreement *(Data Sheet, point 4)*. The amount will be set during grant preparation and it will normally be equal or lower than the prefinancing for your grant.

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The guarantee should be in euro and issued by an approved bank/financial institution established in an EU Member State. If you are established in a non-EU country and would like to provide a guarantee from a bank/financial institution in your country, please contact us (this may be exceptionally accepted, if it offers equivalent security).

Amounts blocked in bank accounts will NOT be accepted as financial guarantees.

Prefinancing guarantees are formally NOT linked to individual consortium members, which means that you are free to organise how to provide the guarantee amount *(by one or several beneficiaries, for the overall amount or several guarantees for partial amounts, by the beneficiary concerned or by another beneficiary, etc.)*. It is however important that the requested amount is covered and that the guarantee(s) are sent to us in time to make the prefinancing (scanned copy via Portal AND original by post).

If agreed with us, the bank guarantee may be replaced by a guarantee from a third party.

The guarantee will be released at the end of the grant, in accordance with the conditions laid down in the Grant Agreement.

Certificates

Depending on the type of action, size of grant amount and type of beneficiaries, you may be requested to submit different certificates. The types, schedules and thresholds for each certificate are fixed in the Grant Agreement *(Data Sheet, point 4 and art 24)*.

Liability regime for recoveries

The liability regime for recoveries will be fixed in the Grant Agreement *(Data Sheet point 4.4 and art 22)*.

For beneficiaries, it is normally:

- limited joint and several liability with individual ceilings — *each beneficiary up to their maximum grant amount*

In addition, the granting authority may require joint and several liability of affiliated entities (with their beneficiary).

Provisions concerning the project implementation

Security rules: *see Model Grant Agreement (art 13 and Annex 5)*

- specific national security framework under Article 27(4) of the EDF Regulation: Yes

Ethics rules: *see Model Grant Agreement (art 14 and Annex 5)*

- specific ethics rules in Annex 5: Yes

IPR rules: *see Model Grant Agreement (art 16 and Annex 5):*

- list of background and background free from restrictions: Yes

- results free from restrictions: Yes

- ownership of results: Yes

- protection of results: Yes

- transfer and licensing of results: Yes

- rights of use on results: Yes

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- for EDF Research Actions: access to results for policy purposes: Yes

- for EDF Research Actions: access to special report: Yes

- for EDF Research Actions: access rights to further develop results: Yes

Communication, dissemination and visibility of funding: *see Model Grant Agreement (art 17 and Annex 5):*

- additional communication and dissemination activities: Yes

Specific rules for carrying out the action: *see Model Grant Agreement (art 18 and Annex 5):*

- specific rules for EDF actions: Yes

- specific rules for PCP Grants for Procurement: No

- place of performance obligation for PCP Grants for Procurement: No

- specific rules for Grants for Financial Support: No

- specific rules for blending operations: No

Other specificities

n/a

Non-compliance and breach of contract

The Grant Agreement (chapter 5) provides for the measures we may take in case of breach of contract (and other non-compliance issues).

ⓘ For more information, *see [AGA — Annotated Grant Agreement](#).*

11. How to submit an application

All proposals must be submitted directly online via the Funding & Tenders Portal Electronic Submission System. Paper applications are NOT accepted.

Submission is a **2-step process**:

a) **create a user account and register your organisation**

To use the Submission System (the only way to apply), all participants need to [create an EU Login user account](#).

Once you have an EULogin account, you can [register your organisation](#) in the Participant Register. When your registration is finalised, you will receive a 9-digit participant identification code (PIC).

b) **submit the proposal**

Access the Electronic Submission System via the Topic page in the [Search Funding & Tenders](#) section (or, for calls sent by invitation to submit a proposal, through the link provided in the invitation letter).

Submit your proposal in 2 parts, as follows:

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- Part A includes administrative information about the applicant organisations (future coordinator, beneficiaries, affiliated entities and associated partners) and the summarised budget for the proposal. Fill it in directly online

- Part B and Annexes through a password-protected single zip archive:

   - Part B (description of the action) covers the technical content of the proposal. Download the mandatory word template from the Submission System, fill it in and add to the zip archive as a PDF

   - Annexes (*see section 5*). Download the templates, and add to zip archive as PDFs (unless other format specified).

The zip archive must be submitted password-protected (using AES-256 encryption method), with a size of less than 100 MB. The password (and any other passwords used in the documents) must be communicated before the deadline for submission to the following email address: DEFIS-EDF-PROPOSALS-PWD@ec.europa.eu (together with the proposal ID and the name of the zip archive).

⚠️ If your proposal includes **classified information**, please contact us at DEFIS-EDF-PROPOSALS@ec.europa.eu well in time before the deadline, in order to arrange the delivery of the classified documents. Please be aware that such documents MUST NOT under any circumstances be submitted online through the Funding & Tenders Portal.

The proposal must keep to the **page limits** *(see section 5)*; excess pages will be disregarded.

Documents must be uploaded to the **right category** in the Submission System otherwise the proposal might be considered incomplete and thus inadmissible.

The proposal must be submitted **before the call deadline** (*see section 4*). After this deadline, the system is closed and proposals can no longer be submitted.

Once the proposal is submitted, you will receive a **confirmation e-mail** (with date and time of your application). If you do not receive this confirmation e-mail, it means your proposal has NOT been submitted. If you believe this is due to a fault in the Submission System, you should immediately file a complaint via the IT Helpdesk webform, explaining the circumstances and attaching a copy of the proposal (and, if possible, screenshots to show what happened).

Details on processes and procedures are described in the Online Manual. The Online Manual also contains the links to FAQs and detailed instructions regarding the Portal Electronic Exchange System.

12. Help

As far as possible, ***please try to find the answers you need yourself***, in this and the other documentation (we have limited resources for handling direct enquiries):

- Online Manual

- FAQs on the Topic page (for call-specific questions in open calls; not applicable for actions by invitation)

- Portal FAQ (for general questions).

Please also consult the Topic page regularly, since we will use it to publish call updates. (For invitations, we will contact you directly in case of a call update).

Contact

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For individual questions on the Portal Submission System, please contact the IT Helpdesk.

Non-IT related questions should be sent to the following email address: DEFIS-EDF-PROPOSALS@ec.europa.eu.

Please indicate clearly the reference of the call and topic to which your question relates *(see cover page)*.

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13. Important

⚠️ **IMPORTANT**

- **Don't wait until the end —** Complete your application sufficiently in advance of the deadline to avoid any last minute **technical problems**. Problems due to last minute submissions *(e.g. congestion, etc.)* will be entirely at your risk. Call deadlines can NOT be extended.

- **Consult** the Portal Topic page regularly. We will use it to publish updates and additional information on the call (call and topic updates).

- **Funding & Tenders Portal Electronic Exchange System —** By submitting the application, all participants **accept** to use the electronic exchange system in accordance with the Portal Terms & Conditions.

- **Registration —** Before submitting the application, all beneficiaries, affiliated entities, associated partners must be registered in the Participant Register. The draft participant identification code (PIC) (one per participant) is mandatory for the Application Form.

  If your project applies for the SME/Mid-cap bonuses, registration (draft PIC and SME self-assessment wizard) is also mandatory for all participants claiming SME/Mid-cap status (beneficiaries, affiliated entities and subcontractors involved in the action; *see section 2*).

  Moreover, registration (draft PIC) is required for entities that must submit an ownership control assessment declaration (beneficiaries, affiliated entities, subcontractors involved in the action and associated partners).

- **Consortium roles —** When setting up your consortium, you should think of organisations that help you reach objectives and solve problems.

  The roles should be attributed according to the level of participation in the project. Main participants should participate as **beneficiaries** or **affiliated entities**; other entities can participate as associated partners, subcontractors, third parties giving in-kind contributions. **Associated partners** and third parties giving in-kind contributions should bear their own costs (they will not become formal recipients of EU funding). **Subcontracting** should normally constitute a limited part and must be performed by third parties (not by one of the beneficiaries/affiliated entities). Subcontracting going beyond 30% of the total eligible costs per beneficiary/affiliated entity must be justified in the application and may be accepted by the granting authority if the topic is not subject to a fixed subcontracting limit *(see section 10)*.

- **Coordinator —** In multi-beneficiary grants, the beneficiaries participate as consortium (group of beneficiaries). They will have to choose a coordinator, who will take care of the project management and coordination and will represent the consortium towards the granting authority. In mono-beneficiary grants, the single beneficiary will automatically be coordinator.

- **Affiliated entities** — Applicants may participate with affiliated entities (i.e. entities linked to a beneficiary which participate in the action with similar rights and obligations as the beneficiaries, but do not sign the grant and therefore do not become beneficiaries themselves). They will get a part of the grant money and must therefore comply with all the call conditions and be validated (just like beneficiaries); but they do not count towards the minimum eligibility criteria for consortium composition (if any).

- **Associated partners** — Applicants may participate with associated partners (i.e. partner organisations which participate in the action but without the right to get grant money). They participate without funding and therefore do not need to be validated.

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- **Consortium agreement** — For practical and legal reasons it is recommended to set up internal arrangements that allow you to deal with exceptional or unforeseen circumstances (in all cases, even if not mandatory under the Grant Agreement). The consortium agreement also gives you the possibility to redistribute the grant money according to your own consortium-internal principles and parameters (for instance, one beneficiary can reattribute its grant money to another beneficiary). The consortium agreement thus allows you to customise the EU grant to the needs inside your consortium and can also help to protect you in case of disputes.

- **Balanced project budget —** Grant applications must ensure a balanced project budget and sufficient other resources to implement the project successfully *(e.g. own contributions, income generated by the action, financial contributions from third parties, etc.)*. You may be requested to lower your estimated costs, if they are ineligible (including excessive).

- **No-profit rule —** Grants may in principle NOT give a profit (i.e. surplus of revenues + EU grant over costs). Where the no-profit rule is activated in the Grant Agreement, this will be checked by us at the end of the project.

- **No double funding —** There is a strict prohibition of double funding from the EU budget (except under EU Synergies actions). Outside such Synergies actions, any given action may receive only ONE grant from the EU budget and cost items may under NO circumstances be declared to two different EU actions.

- **Completed/ongoing projects —** Proposals for projects that have already been completed will be rejected; proposals for projects that have already started will be assessed on a case-by-case basis (in this case, no costs can be reimbursed for activities that took place before the project starting date/proposal submission).

- **Combination with EU operating grants —** Combination with EU operating grants is possible, if the project remains outside the operating grant work programme and you make sure that cost items are clearly separated in your accounting and NOT declared twice *(see [AGA — Annotated Grant Agreement, art 6.2.E](#))*.

- **Multiple proposals —** Applicants may submit more than one proposal for *different* projects under the same call (and be awarded a funding for them).

  Organisations may participate in several proposals.

  BUT: if there are several proposals for *very similar* projects, only one application will be accepted and evaluated; the applicants will be asked to withdraw one of them (or it will be rejected).

- **Resubmission —** Proposals may be changed and re-submitted until the deadline for submission.

- **Rejection —** By submitting the application, all applicants accept the call conditions set out in this this Call Document (and the documents it refers to). Proposals that do not comply with all the call conditions will be **rejected**. This applies also to applicants: All applicants need to fulfil the criteria; if any one of them doesn't, it must be replaced or the entire proposal will be rejected.

- **Cancellation —** There may be circumstances which may require the cancellation of the call. In this case, you will be informed via a call or topic update. Please note that cancellations are without entitlement to compensation.

- **Language —** You can submit your proposal in any official EU language (project abstract/summary should however always be in English). For reasons of efficiency, we strongly advise you to use English for the entire application. If you need the call documentation in another official EU language, please submit a request within 10 days after call publication (for the contact information, *see section 12*).

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- **Transparency —** In accordance with Article 38 of the EU Financial Regulation, information about EU grants awarded is published each year on the Europa website.

  This includes:
  - beneficiary names
  - beneficiary addresses
  - the purpose for which the grant was awarded
  - the maximum amount awarded.

  The publication can exceptionally be waived (on reasoned and duly substantiated request), if there is a risk that the disclosure could jeopardise your rights and freedoms under the EU Charter of Fundamental Rights or harm your commercial interests.

- **Data protection —** The submission of a proposal under this call involves the collection, use and processing of personal data. This data will be processed in accordance with the applicable legal framework. It will be processed solely for the purpose of evaluating your proposal, subsequent management of your grant and, if needed, programme monitoring, evaluation and communication. Details are explained in the Funding & Tenders Portal Privacy Statement.

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<div style="text-align:right">Annex 1</div>

EDF types of action

EDF uses the following actions to implement grants:

Research Actions

Description: Research Actions (RA) target activities consisting primarily of research activities, in particular applied research and where necessary fundamental research, with the aim of acquiring new knowledge and with an exclusive focus on defence applications.

Funding rate: 100%

Payment model: Prefinancing — (x) additional prefinancing payment(s) — (x) interim payment(s) — final payment

Development Actions

Description: Development Actions (DA) target activities consisting of defence-oriented activities primarily in the development phase, covering new defence products or technologies or the upgrading of existing ones, excluding the production or use of weapon.

Funding rate: variable per activity (rates depend on activity and bonuses for SME and mid-cap participation and PESCO)

Payment model: Prefinancing — (x) additional prefinancing payment(s) — (x) interim payment(s) — final payment

PCP Grants for Procurement

Description: PCP Grants for Procurement (PCP) target activities that aim to help a transnational buyers' group to strengthen the public procurement of research, development, validation and, possibly, the first deployment of new solutions that can significantly improve quality and efficiency in areas of public interest, while opening market opportunities for industry and researchers active in Europe. Eligible activities include the preparation, management and follow-up, under the coordination of a lead procurer, of one joint PCP and additional activities to embed the PCP into a wider set of demand-side activities.

Funding rate: variable (to be defined in the work programme)

Payment model: Prefinancing — (x) additional prefinancing payment(s) — (x) interim payment(s) — payment of the balance

Lump Sum Grants for Research Actions

Description: Lump Sum Grants (LS-RA) reimburse a general lump sum for the entire project and the consortium as a whole. The lump sum is fixed ex-ante (at the latest at grant signature) on the basis of a methodology defined by the granting authority (either on the basis of a detailed project budget or other pre-defined parameters). The lump sum will cover all the beneficiaries' direct and indirect costs for the project. The beneficiaries do not need to report actual costs, they just need to claim the lump sum once the work is done. If the action is not properly implemented, only part of the lump sum will be paid.

Lump Sum Grants for Research Actions cover the same type of activities as Research Actions and follow — where relevant — similar rules *(e.g. for funding rates, etc.)*.

Call: EDF-2024-LS-RA-CHALLENGE — Call for EDF research actions, in the form of a technological challenge, implemented via lump sum grants

EU Grants: Call document (EDF): V1.1 – 28.08.2024

Funding rate: 100%

Payment model: Prefinancing — (x) additional prefinancing payment(s) — (x) interim payment(s) — final payment

Lump Sum Grants for Development Actions

Description: Lump Sum Grants (LS-DA) reimburse a general lump sum for the entire project and the consortium as a whole. The lump sum is fixed ex-ante (at the latest at grant signature) on the basis of a methodology defined by the granting authority (either on the basis of a detailed project budget or other pre-defined parameters). The lump sum will cover all the beneficiaries' direct and indirect costs for the project. The beneficiaries do not need to report actual costs, they just need to claim the lump sum once the work is done. If the action is not properly implemented, only part of the lump sum will be paid.

Lump Sum Grants for Development Actions cover the same type of activities as Development Actions and follow — where relevant — similar rules *(e.g. for funding rates, etc.).*

Funding rate: variable per activity (rates depend on activity and bonuses for SME and mid-cap participation and PESCO)

Payment model: Prefinancing — (x) additional prefinancing payment(s) — (x) interim payment(s) — final payment

Framework Partnerships (FPAs) and Specific Grants (SGAs)

FPAs

Description: FPAs establish a long-term cooperation mechanism between the granting authority and the beneficiaries of grants. The FPA specifies the common objectives (action plan) and the procedure for awarding specific grants. The specific grants are awarded via identified beneficiary actions (with or without competition).

Funding rate: no funding for FPA

SGAs

Description: The SGAs are linked to an FPA and implement the action plan (or part of it). They are awarded via an invitation to submit a proposal (identified beneficiary action). The consortium composition should in principle match (meaning that only entities that are part of the FPA can participate in an SGA), but otherwise the implementation is rather flexible. FPAs and SGAs can have different coordinators; other partners of the FPA are free to participate in an SGA or not. There is no limit to the amount of SGAs signed under one FPA.

Funding rate: depending on the type: 100% or variable per activity

Payment model: Prefinancing — (x) additional prefinancing payment(s) — (x) interim payment(s) — final payment

Call: EDF-2024-LS-RA-CHALLENGE — Call for EDF research actions, in the form of a technological challenge, implemented via lump sum grants

EU Grants: Call document (EDF): V1.1 – 28.08.2024

Annex 2

Guarantees pursuant to Article 9(4) of the EDF Regulation

All calls under the EDF Programme are subject to ownership control restrictions, meaning that they exclude the participation of legal entities which are established in the EU territory or in an EDF associated country, but are controlled by a non-associated third country or non-associated third country legal entity.

Thus, for the purposes of participating in EDF actions, beneficiaries, affiliated entities, associated partners and subcontractors involved in the action must not be subject to control by a non-associated third country or non-associated third-country entity and undergo an ownership control assessment procedure before grant signature.

Entities that do not comply with this requirement may however exceptionally nevertheless participate, if they can provide guarantees approved by the Member State/EDF associated country in which they are established. Such guarantees must be provided at the latest by grant signature.

The guarantees must provide assurance to the granting authority that the participation of the entity will not contravene the security and defence interests of the EU and its Member States as established in the framework of the Common Foreign and Security Policy (CFSP) pursuant to Title V of the TEU, or the objectives set out in Article 3 of the EDF Regulation. They must also comply with the provisions on ownership and intellectual property rights (Articles 20 and 23 of the EDF Regulation).

They must in particular substantiate that, for the purposes of the action, measures are in place to ensure that:

– **control** over the legal entity is not exercised in a manner that would restrain or restrict its ability to carry out the action and to deliver results, that would impose restrictions concerning its infrastructure, facilities, assets, resources, intellectual property or knowhow needed for the purposes of the action, or that would undermine its capabilities and standards necessary to carry out the action

– **access** by a non-associated third country or non-associated third-country entity to sensitive information relating to the action is prevented and the employees or other persons involved in the action have national security clearance issued by a Member State or an EDF associated country, where appropriate

– **ownership** of the intellectual property arising from, and the results of, the action remain within the beneficiary or affiliated entity during and after completion of the action, are not subject to control or restriction by a non-associated third country or non-associated third-country entity, and are neither exported outside the EU/EDF associated countries nor accessible from outside the EU/EDF associated countries without the approval of the Member State/EDF associated country in which the legal entity is established and in accordance with the objectives set out in Article 3 of the EDF Regulation.

The guarantees may refer to the fact that the legal entity's executive management structure is established in the EU/EDF associated country or, if considered appropriate, to specific governmental rights in the control over the legal entity.

If considered appropriate by the Member State/EDF associated country, additional guarantees may be provided.

ℹ️ For more information, *see also Guidance on participation in DEP, HE, EDF and CEF-DIG restricted calls*.

Call: EDF-2024-LS-RA-CHALLENGE — Call for EDF research actions, in the form of a technological challenge, implemented via lump sum grants

EU Grants: Call document (EDF): V1.1 – 28.08.2024

Annex 3

Security aspects

Introduction

Pursuant to Article 27(4) of the EDF Regulation, in case the implementation of the grant involves the handling of classified information, Member States on whose territory the beneficiaries and affiliated entities are established must decide on the originatorship of the classified foreground information (results) generated in the performance of the project. For that purpose, those Member States may decide on a specific security framework for the protection and handling of classified information relating to the project and must inform the granting authority. Such a security framework must be without prejudice to the possibility for the granting authority to have access to necessary information for the implementation of the action.

If no such specific security framework is set up by those Member States, the security framework will be put in place by the granting authority in accordance with Decision 2015/444.

In either case, the security framework will be put in place at the latest by the signature of the Grant Agreement.

The applicable security framework will be detailed in the security aspect letter (SAL) which will be annexed to the Grant Agreement.

When you implement a classified grant, please bear in mind the following key rules.

Access to classified information

The creation, handling or access to information classified CONFIDENTIAL or SECRET (or RESTRICTED where required by national rules) on the premises of a participant is only possible if a valid Facility Security Clearance (FSC) at the appropriate level exists for the premises. This FSC must be granted by the National Security Authority (NSA/DSA) of the participant concerned.

The participant must hold a duly confirmed FSC at the appropriate level. Until a secured area is in place and accredited by the national NSA, the handling of classified information above RESTRICTED level on their premises is not allowed.

Access to and handling of classified information for the purposes of the project must be limited to individuals with a need-to-know and which are in possession of a valid personnel security clearance.

At the end of the Grant Agreement when EUCI is no longer required for the performance of the grant, the participant must return any EUCI they hold to the contracting authority immediately. If authorised to retain EUCI after the end of the grant, the EUCI must continue to be protected in accordance with Decision 2015/444.

Marking of classified information

Classified information generated for the performance of the action must be marked in accordance with the applicable security framework, as described in the SAL.

Grants must not involve information classified 'TRES SECRET UE/EU TOP SECRET' or any equivalent classification.

Other provisions

Where a participant has awarded a classified subcontract, the security provisions of the grant agreement must apply *mutatis mutandis* to the subcontractor(s) and their personnel. In such case, it is the responsibility of the participant to ensure that all subcontractors apply these principles to their own subcontracting arrangements.

All security breaches related to classified information will be investigated by the competent security authority and may lead to criminal prosecution under national law.

Table of equivalent security classification markings

Call: EDF-2024-LS-RA-CHALLENGE — Call for EDF research actions, in the form of a technological challenge, implemented via lump sum grants

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	Secret	Confidential	Restricted
EU	SECRET UE/EU SECRET	CONFIDENTIEL UE/EU CONFIDENTIAL	RESTREINT UE/EU RESTRICTED
Austria	GEHEIM	VERTRAULICH	EINGESCHRÄNKT
Belgium	SECRET (Loi du 11 Dec 1998) or GEHEIM (Wet van 11 Dec 1998)	CONFIDENTIEL (Loi du 11 Dec 1998) or VERTROUWELIJK (Wet van 11 Dec 1998)	*(Note 1, see below)*
Bulgaria	СЕКРЕТНО	ПОВЕРИТЕЛНО	ЗА СЛУЖЕБНО ПОЛЗВАНЕ
Croatia	TAJNO	POVJERLJIVO	OGRANIČENO
Cyprus	ΑΠ'ΟΡΡΗΤΟ ABR:(ΑΠ)	ΕΜΠΙΣΤΕΥΤΙΚΌ ABR:(ΕΜ)	ΠΕΡΙΟΡΙΣΜΈΝΗΣ ΧΡΉΣΗΣ ABR:(ΠΧ)
Czech Republic	TAJNÉ	DŮVĚRNÉ	VYHRAZENÉ
Denmark	HEMMELIGT	FORTROLIGT	TIL TJENESTEBRUG
Estonia	SALAJANE	KONFIDENTSIAALNE	PIIRATUD
Finland	SALAINEN or HEMLIG	LUOTTAMUKSELLINEN or KONFIDENTIELL	KÄYTTÖ RAJOITETTU or BEGRÄNSAD TILLGÅNG
France	SECRET SECRET DÉFENSE *(Note 2, see below)*	CONFIDENTIEL DÉFENSE *(Notes 2 and 3, see below)*	*(Note 4, see below)*
Germany *(Note 5, see below)*	GEHEIM	VS - VERTRAULICH	VS - NUR FÜR DEN DIENSTGEBRAUCH
Greece	ΑΠ'ΟΡΡΗΤΟ ABR:(ΑΠ)	ΕΜΠΙΣΤΕΥΤΙΚΌ ABR:(ΕΜ)	ΠΕΡΙΟΡΙΣΜΈΝΗΣ ΧΡΉΣΗΣ ABR:(ΠΧ)

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Hungary	TITKOS!	BIZALMAS!	KORLÁTOZOTT TERJESZTÉSŰ!
Ireland	SECRET	CONFIDENTIAL	RESTRICTED
Italy	SEGRETO	RISERVATISSIMO	RISERVATO
Latvia	SLEPENI	KONFIDENCIĀLI	DIENESTA VAJADZĪBĀM
Lithuania	SLAPTAI	KONFIDENCIALIAI	RIBOTO NAUDOJIMO
Luxembourg	SECRET LUX	CONFIDENTIEL LUX	RESTREINT LUX
Malta	SIGRIET	KUNFIDENZJALI	RISTRETT
Netherlands	Stg. GEHEIM	Stg. CONFIDENTIEEL	Dep. VERTROUWELIJK
Poland	TAJNE	POUFNE	ZASTRZEŻONE
Portugal	SECRETO	CONFIDENCIAL	RESERVADO *(Note 6, see below)*
Romania	STRICT SECRET	SECRET	SECRET DE SERVICIU
Slovakia	TAJNÉ	DÔVERNÉ	VYHRADENÉ
Slovenia	TAJNO	ZAUPNO	INTERNO
Spain	RESERVADO *(Note 6, see below)*	CONFIDENCIAL	DIFUSIÓN LIMITADA
Sweden	HEMLIG	KONFIDENTIELL	BEGRÄNSAT HEMLIG

Notes:

Note 1 Belgium: 'Diffusion Restreinte/Beperkte Verspreiding' is not a security classification in Belgium. Belgium handles and protects RESTREINT UE/EU RESTRICTED information and classified information bearing the national classification markings of RESTRICTED level in a manner no less stringent than the standards and procedures described in the security rules of the Council of the European Union.

Note 2 France: Information generated by France before 1 July 2021 and classified SECRET DÉFENSE and CONFIDENTIEL DÉFENSE continues to be handled and protected at the equivalent level of SECRET UE/EU SECRET and CONFIDENTIEL UE/EU CONFIDENTIAL respectively.

Note 3 France: France handles and protects CONFIDENTIEL UE/EU CONFIDENTIAL information in accordance with the French security measures for protecting SECRET information.

Note 4 France: France does not use the classification 'RESTREINT' in its national system. France handles and protects RESTREINT UE/EU RESTRICTED information in a manner no less stringent than the standards and procedures described in the security rules of the Council of the European

Union. France will handle classified information bearing the national classification markings of RESTRICTED level in accordance with its national rules and regulations in force for 'DIFFUSION RESTREINTE'. The other Participants will handle and protect information marked 'DIFFUSION RESTREINTE' according to their national laws and regulations in force for the level RESTRICTED or equivalent, and according to the standards defined in the present document.

Note 5 Germany: VS = Verschlusssache.

Note 6 Portugal and Spain: Attention is drawn to the fact that the markings RESERVADO used by Portugal and Spain refer to different classifications.

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<div align="right">**Annex 4a**</div>

<div align="center">

Preliminary evaluation plan
for the EDF technological challenge on Robust Autonomous Drone Navigation
(Topics EDF-2024-LS-RA-CHALLENGE-SENS-RADNP and EDF-2024-LS-RA-CHALLENGE-SENS-RADNO)

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Introduction

This Annex 4a is the preliminary evaluation plan for the EDF technological challenge on Robust Autonomous Drone Navigation (RADIAN). It provides a general description of the testing environment, metrics and protocols under which the research teams participating to the challenge will evaluate their systems. It is provided as part of the call documents for the topics of the EDF call EDF-2024-LS-RA-CHALLENGE in order to enable applicants to prepare projects that can cooperate smoothly with one another. For each actual test campaign, a more detailed evaluation plan will be produced by the challenge organisers in coordination with the participating teams.

Overall concept and timeline

The challenge aims at measuring, in an objective and comparable way, the performances of different approaches to **autonomous aerial drone navigation** in non-permissive environments.

In the framework of the challenge, **field tests** are organised during which autonomous drones should go from start areas to target areas, possibly through designated waypoints. Depending on the scenarios, the target area may be the same as the start area. For the sake of clarity of the assessments, the target areas are clearly designated, e.g. by their geographical coordinates, and clearly recognisable visually, e.g. with easily distinguishable markings and well-defined boundaries.

The field tests are organised **in various environments** (indoor and outdoor, with various weather and illumination conditions) **with different levels of difficulties** in terms of obstacles (e.g. buildings, hills, trees, power lines, nets, etc.), visual cues (uniform vs. varied landscapes), distance between waypoints, GNSS jamming or spoofing, communications jamming, radar jamming and deception, direct threats to the drone platforms, etc. These environments and threats are representative of real operational conditions. However, direct threats to the platforms are simulated and do not lead the concerned platforms to be actually damaged, even if they may lead to abort their participation to the mission. Furthermore, to enable experimenting solutions that are not yet optimised in terms of power consumption, the flight scenarios are designed to require relatively short flight durations.

Four types of field tests are conducted:

- Single drone flights, with the goal of *reaching the target area in minimum time.* Two variants of these tests are conducted:

    o **Autonomous drone** flight

    o **Semi-autonomous drone** flight controlled by a pilot assisted by autonomous navigation functions such as obstacle avoidance.

- Drone swarm flights, with the goal of *maximising the proportion of drones reaching the target area within a given time.* Two variants of these tests are conducted:

    o **Autonomous swarm** flight

    o **Semi-autonomous swarm** controlled by a pilot. Only one pilot is involved.

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An underlying goal is that the drones **estimate their positions with maximum accuracy**. In order to determine the actual position of the drones (reference position) despite potential GNSS jamming or spoofing, an independent system is set up by the organisers. It may be based on surveillance cameras, a motion-capture system, or other systems involving a payload provided by the organisers, e.g. based on radio beacons. If the reference positions cannot be collected in all parts of the test zones, at least the most important parts for the experiments are covered. Test flights with no jamming are also conducted whereby the on-board GNSS receivers are used for establishing the reference positions but not for autonomous navigation.

Sensor data acquired and used by the systems during the field tests should be recorded in order to further develop autonomous navigation modules in a well-controlled way and with short development cycles. Such data is shared across teams in order to experiment different approaches on various data. A framework for trusted and secure information exchange is set up for that purpose. In order to measure performances of AI-based software modules in an objective and comparable way, **data-based tests** are organised whereby test data is released simultaneously to all participating teams who send back the system outputs by a given deadline (typically a few days later) to the organisers for scoring.

A core function for robust navigation that is evaluated with these data-based tests is **obstacle detection**. This may include obstacles that are difficult to detect such as narrow, small, or moving obstacles. The objective is to estimate the range of objects surrounding the drone, especially in the flight direction but also over a wider field of vision to enable the timely detection of fast-moving objects. The software modules should output range images, which can be compared to manually verified range images on areas of interest in the images.

Data-based tests take place in between two field test campaigns, in order to use data collected during a given field test campaign to enhance software modules and use them for the next one. Both data-based and field tests are followed by **debriefing workshops**, where the organisers present the consolidated performance measurements, and all teams present an analysis of their approach and results.

The challenge lasts four years and covers **four evaluation campaigns**, each lasting about a year. The first one involves only field tests. It is a dry-run phase, where some adaptation of the evaluation protocols might be needed before delivering meaningful measurements. The next three evaluation campaigns are fully-fledged ones involving both field and data-based tests.

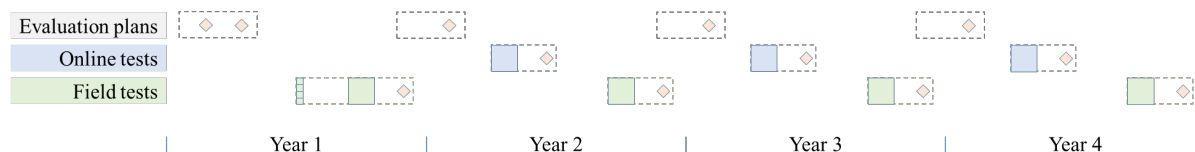For each of the three fully-fledged campaigns, a proposed general timeline is as follows:

- January: Evaluation plan discussion workshop;

- April: Data-based tests;

- June: Debriefing workshop;

- September: Field tests;

- November: Debriefing workshop.

For the first campaign, a proposed general timeline is as follows:

- Spring: Evaluation plan discussion workshops;

- June: Individual on-site trials;

- September: Field tests;

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- November: Debriefing workshop.

This proposed general timeline is illustrated below.

Each field test campaign lasts about a week and a half. The first days are devoted to the installation of the teams and trials using a small-scale testing area available to the participating teams with minimal constraints. At least three days are devoted to actual tests. At least one evening session is organised to experiment night flight conditions. Several testing zones with various levels of difficulties are available. Runs can be performed by different teams in parallel in the different testing zones. The last day is devoted to a debriefing meeting before departure of the teams.

The precise timeline of the field and data-based test campaigns is determined in the specific evaluation plan of each evaluation campaign.

A few weeks before the first field test campaign, on-site trials are organised individually for each team, for a duration of up to two days per team.

Discussion and debriefing workshops gather all stakeholders and are expected to last about two days, travel included. Additional meetings are likely to be needed but can be organised online.

Over the challenge duration, field test campaigns are hosted in at least two different sites.

Systems

The drones used in the challenge should be relatively small drones offering a compromise between the ease of experimentations (including the ease of transportation to the field test locations) and the ability to carry the relevant sensing and computing payloads. Swarms of different sizes and various platforms and/or payloads in heterogeneous swarms may be tested to explore the impact in terms of robustness to difficulties present in the test scenarios.

The drones in the swarm may be wirelessly connected with one another and share data and computational power. They may also be connected to a ground station and rely on cloud-based computing. However, navigation should be robust to communications loss. Most of the processing for navigation is therefore expected to take place on-board.

Interoperability standards should be followed as much as possible. Participating teams are welcome to team up and participate jointly for some tasks in addition to their individual team participations.

The drones should be able to record the data acquired through their sensors. If some sensor data used for navigation during field tests cannot be recorded for practical reasons, this should be justified.

Tasks and metrics

Overview

The table below provides an overview of the minimal set of tasks that are evaluated in the framework of the challenge. Further tasks, for example speed estimation, may also be evaluated.

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General objective	Task	Metric	Measurable during	
			Field tests	Data-based tests
Navigation	Autonomous drone navigation	Time to reach the target area	X	
	Semi-autonomous drone navigation	Time to reach the target area	X	
	Autonomous swarm navigation	Proportion of drones reaching the target area in time	X	
	Semi-autonomous swarm navigation	Proportion of drones reaching the target area in time	X	
Positioning	Positioning	Average positioning accuracy	X	X
Obstacle detection	Obstacle range estimation	Median of the relative range error		X

These tasks are detailed in the following subsections.

For each test zone, a first run is conducted without direct prior knowledge of the zone by the autonomous drones. However, use of information available from other sources such as maps, and satellite or aerial images is allowed. Further runs are conducted in the same zone to give systems the possibility to learn its characteristics. However, some obstacles may be added or removed for specific runs without prior notice.

Autonomous drone navigation (field tests only)

The objective of the task is to go from a starting area to a designated target area in a minimum time, possibly through waypoints. The metric is the time from take-off from the starting area to landing on the target area. If the drone crashes, misses a waypoint, or if a predefined maximum duration is reached, the test is aborted and recorded as such.

Semi-autonomous drone navigation (field tests only)

The metric is the same as for the autonomous drone navigation.

Autonomous swarm navigation (field tests only)

The objective of the task is to go from a starting area to a designated target area, possibly through waypoints, while maximising the proportion of drones reaching the target area within a given time. The metric is the proportion of drones reaching the target area after going through all waypoints.

Semi-autonomous swarm navigation (field tests only)

The metric is the same as for the autonomous swarm navigation.

Any relevant information for clearly identifying the target area is provided to the pilot including geographical coordinates and relevant maps. Runs of reconnaissance with only the piloted drone, and without recording any sensor data, may be performed. The boundaries of the zone within which the run should be conducted should also be clearly indicated to the pilot.

Positioning

The objective of the task is to estimate the drone positions with maximum accuracy. For a single drone, the metric is the average positioning accuracy over the parts of the flight where the reference position is available. For a swarm of drones, the average is computed over all drones.

Obstacle range estimation (data-based tests only)

The objective of the task is to estimate the range of the objects surrounding the drone and which could be obstacles. The input is all available sensor data up to the current time. The output is the range information for a set of directions from the sensor. Such a set can typically be all pixels in an optical image. The reference range information is established by manually correcting errors in such outputs and/or exploiting a 3D model of the test zone. A subset of the directions which are most interesting for obstacle range estimation is considered. In particular, directions where the range cannot be unambiguously determined are discarded. Directions where the range is beyond a certain ceiling may also be discarded. The relative range error (in percentage) is computed for each considered direction. The overall metric is the median of the relative range error over all considered directions. The use of the median is intended to limit the influence of potential outliers. However, other metrics such as the average may be considered.

Data collection, annotation and sharing

By default, all sensor data collected during field tests and used for any challenge task should be provided to the challenge organisers and made available to the other teams in the framework of the challenge. In order to ensure trust and secure exchange of data, teams must sign a data management agreement (template to be developed).

If some of the data used by a system cannot be shared for any reasons, and if the comparison between performances obtained during field tests (using all data) and data-based test (using only the provided subset) show a significant difference, the concerned team should report on an analysis of this difference.

For the field test runs where GNSS receivers are used to establish the reference positions, these reference positions for at least one of the test zones are not kept by the participating teams so that they can be used for data-based tests, together with the corresponding sensor data. Such data is expectedly used in the immediately following campaign. However, some of it may be set aside for a next campaign, in order to benefit then from data recorded in more varied conditions, and to enable more meaningful performance comparisons across the years.

Additional training and development data coming from other sources beyond the challenge may be used if available and relevant.

Sensor data annotation for the obstacle range estimation task follows guidelines documented by the organisers. These guidelines are presented and discussed together with the evaluation plans.

After each test campaign, the teams noticing possible errors in the reference data used to score their systems may send them to the organisers, who should duly take them into account to improve the quality of the reference data if relevant.

Communication

Representatives of potential users of the technologies are invited to assist to field tests, and possibly to workshops.

Without prejudice to other provisions, participating teams may communicate on their own results and methods. Documents on challenge-level results are prepared by the

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organisers and are submitted for comments to the teams and for approval to the granting authority before actual publication.

Security aspects

All participating systems should be fully compliant with the safety and security regulations (to be appended to the detailed evaluation plans). In the event such compliance cannot be ensured, the concerned team must communicate this timely to the organisers in view of finding a suitable solution.

Further security aspects related to the field-testing sites can be defined in the detailed evaluation plans. Systems should comply with the flight restrictions provided by the organisers and remain in the test zone foreseen for each run. They should also respect any limitations in term of usable radio frequencies and power.

Participation rules

Participants must respect the rules ensuring that data-based tests are not biased. In particular, they should not look at the data content until completion of its processing during the test.

Logistics

During each field test campaign, the organisers make available a separate working area for each team. Accommodation and travel costs are covered by the teams.

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Preliminary evaluation plan
for the EDF technological challenge on Multi-source Satellite Image Analysis
(Topics EDF-2024-LS-RA-CHALLENGE-SPACE-MSIAP and EDF-2024-LS-RA-CHALLENGE-SPACE-MSIAO)

Introduction

This Annex 4b is the preliminary evaluation plan for the EDF Challenge on Multi-source Satellite Image Analysis (MSIA). It provides a general description of the testing environment, metrics and protocols under which the research teams participating to the challenge will evaluate their systems. It is provided as part of the EDF-2024-LS-RA-CHALLENGE call document and topic descriptions to enable applicants to prepare projects that can cooperate smoothly with one another. For each actual test campaign, a more detailed evaluation plan will be produced by the challenge organisers in coordination with the participating teams.

Overall concept and timeline

The challenge aims at measuring, in an objective and comparable way, the performances of different MSIA systems developed by the participants to the challenge, and at supporting their progress.

The challenge covers three types of tasks: **semantic segmentation**, **object recognition**, and **characteristic estimation**. The tasks are described in the next section.

One specificity of this challenge compared to others in the same domain is that **extensive efforts are invested in annotating data to ensure highly accurate and meaningful performance measurements**. First, guidelines for the data annotation are documented in writing, discussed, and agreed by all stakeholders. Second, part of the data is annotated by two annotators independently of each other based on these guidelines, the level of consistency between the two resulting sets of annotations (the "inter-annotator agreement") is analysed, and the guidelines may be revised if needed to improve the inter-annotator agreement. Third, parts of the data that are intrinsically ambiguous for a given type of annotation are marked as such and discarded from the scoring. Fourth, any issue in the annotation identified by the challenge participants should be considered by the organisers and corrected if relevant. These provisions ensure that only real errors from the systems are measured as such.

Thanks to this way of measuring error rates without overestimation, these error rates can be summed over the different semantic classes to be recognised in the images in order to yield meaningful **multi-class error rates (MCER)**. Using such an integrated multi-class metric is another specificity of the challenge. It creates **an incentive for systems to model inter-class dependencies** compensating the risk of getting higher error rates when the number of classes increases.

The challenge lasts four years and covers **four evaluation campaigns**, each lasting about a year. The exact choice of semantic classes, object types and characteristics to be recognised in a given campaign is part of the definition of the evaluation plan, taking into account the possibilities of the organisers and of the participants as well as the guidance provided by the user board. A preliminary list is provided in the appendix to this Annex.

Test data for one evaluation campaign can be used as **training or development data** for the next ones. The first evaluation campaign is a dry run, whereby setting up the testing protocols is a goal in itself and the meaningfulness of measurements might not be guaranteed, but any measurement issues should be identified and remedied in order to ensure that subsequent campaigns yield meaningful measurements.

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Tests are followed by **debriefing workshops**, where the organisers present the consolidated performance measurements, and the participating teams present an analysis of their approaches and results.

Tasks and metrics

Overview

The challenge covers three types of tasks:

- Semantic segmentation;

- Object recognition;

- Characteristic estimation.

Details per type of task are provided in the following subsections.

For each specific task:

- Background information of any type may be used as input provided that it is not more recent than a cut-off date specified in the evaluation plan of each campaign.

- In order to assess the added value of combining optical and radar images, contrast experiments, where only one type of images is used, are conducted.

- A given team can submit several variants of a system. However, one of these submissions must then be designated as the primary one and be used for the official performance measurement.

Semantic segmentation

This task consists in a pixel-wise classification of an image for a given set of semantic classes. A semantic class is defined by a textual description and training labelled image data.

Classes to be recognised may be semantically overlapping. Relationships between classes may be provided when relevant (e.g. 'truck' 'is a' 'vehicle', 'airport hangar' 'is part of' an 'airport'). Further relationships between classes are expected to be modelled by the systems in order to improve multi-class recognition.

For each class, a sub-task consists in determining which regions of a test image correspond to the class. This is a binary classification, the rest of the image being considered as not corresponding to the class. However, parts of the image for which the reference is considered as ambiguous are not scored. The pixels in error are thus those where the system hypothesis (system output) does not match the reference (ground truth) if this reference is considered as unambiguous for the considered class. The error rate for the sub-task is the number of such pixel-wise errors divided by the total number of pixels in the image.

For classes involving change detection, images covering the same areas at different dates and against which changes should be estimated are provided.

For the overall task, the error rate is this total number of errors over the set of classes to be recognised divided by the number of pixels in the image. This multi-class error rate (MCER) can be computed in the same way over a set of images.

Object recognition

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This task consists in the recognition in images of objects from a given set of object types. An object is defined by a textual description and training image data annotated with the regions where the object can be seen.

The different object types to be recognised may be semantically overlapping. Relationships between object types may be provided when relevant.

An object is considered as correctly recognised (true positive) if the following conditions are met:

1) The hypothesised object type is the same as the reference object type;

2) The hypothesised region significantly overlaps with a reference region, and more precisely the intersection over union is above a given threshold (a priori 50%);

3) Neither the hypothesised object nor the reference object have already been matched with the correct type and a better overlap.

Similarly, an object is considered as mistaken for another (substitution) if the following conditions are met:

1) The hypothesised object type is different from the reference object type;

2) The hypothesised region significantly overlaps with a reference region, and more precisely the intersection over union is above a given threshold (a priori 50%);

3) Neither the hypothesised object not the reference object has already been matched with a better overlap.

A hypothesised object that cannot be matched with any reference object is considered as a false positive. A reference object that cannot be matched with any hypothesised object is considered as a false negative. Ambiguity in the image data and annotated as such is taken into account in the scoring. For example, a reference object for which the presence is considered as ambiguous does not lead to false negatives. The error rate is the total number of errors (substitutions, false positives, and false negatives) divided by the total number of objects present in the reference. This multi-object detection error rate (MODER) can be computed in the same way over a set of images.

Other metrics such as the mean average precision (mAP) may be computed for the sake of comparison with other research works using these metrics.

Characteristic estimation

The tasks falling under this category consist in the estimation of specific characteristics of certain types of semantic classes and objects.

By default, for characteristics that are continuous (volume, height, depth, slope, speed, humidity level, etc.), the metric is a percentage of error, and for characteristics that are discrete attributes, the metric is an error rate. For the estimation of the composition in terms of materials, the proportion of a given material in the composition is considered. For semantic classes, the error percentage or rate is averaged over the concerned area. The median is also computed.

Data

The challenge organisers annotate the image data with reference annotations according to guidelines documented in a separate document. These annotations are used to score the submitted systems. Where the image data do not allow an unambiguous recognition, this is annotated as such and used during scoring to not penalise systems recognising either way.

For object detection, the images regions where an object can be seen may be simply defined by a bounding box where appropriate. However, whenever needed to ensure an accurate evaluation, the regions may have to be defined by a polygon or even by a set of pixels.

Following test periods, the participants are invited to check the annotations used for scoring in order to spot any needed correction and submit candidate corrections to the organisers. The organisers take them into account to improve the annotations. Any unresolved discrepancies between participant and organiser views on the annotations is described in a document produced by the organisers and shared with the participants before the debriefing workshop.

File formats will be described in the detailed evaluation plans.

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Appendix to Annex 4b - Table of semantic classes and objects to recognise and characterise

The table below provides a proposed list of semantic classes, objects, and characteristics to recognise in order to bootstrap the discussions toward the elaboration of the evaluation plan of the first evaluation campaign. The first three columns provide the information for semantic class recognition. The fourth column lists the classes that should also be recognised as individual objects. The last column provides the information for characteristic recognition. The actual list for each campaign is expected to be expended with further specific classes, especially for various types of aircrafts, ships and vehicles. Definitions may also need to be refined.

Name	Definition	Involves change detection	Object	Characteristics
Aircraft	Planes, helicopters, UAVs		x	Length, width
Airfield	Airfields and airports, including the runways, taxiways, aprons, control towers and terminals. Car parks around the airport are not included. Vegetation within the airport secured perimeter, if any, is not scored.			
Airfield runway	Airfield runways		x	Length
Airport control tower	Airport control towers		x	Height
Airport hangar	Airport hangars that can shelter planes			
Antenna	Radar or communication antennas			
Bridge	Bridges over bodies of water, roads, railways, valleys, for vehicles and/or pedestrians, without blocking the way underneath. Pontoon bridges are not included.			
Building	Inhabitation or office buildings			Height, composition (concrete, metal, glass, wood)

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Name	Definition	Involves change detection	Object	Characteristics
Climate/environment disaster-affected areas	Areas where there is a change that can be attributed to natural hazards and affects human life	x		
Communication antenna	Communication antennas			
Construction works	Works towards the construction of infrastructures such as buildings and industrial facilities.	x		
Dam	Dams, including weirs			
Damaged (weapon-affected) areas	Areas where there are damages from weapon attacks	x		
Factory	Manufacturing or production plants			
Fighter aircraft	Military aircraft designed to establish air superiority of the battlespace		x	Length, width
Fixed artillery	Artillery equipment that is not self-propelled		x	
Ground	Area not covered by water			Slope
Helicopter	Rotating-wing aircraft		x	Length, width
Industrial installation	Facilities for producing or processing equipment, materials, energy, or information at an industrial scale. Includes factories, power stations, water treatment plants, and telecommunication plants.			

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Name	Definition	Involves change detection	Object	Characteristics
Lock	Device used for raising and lowering watercraft between stretches of water of different levels on river and canal waterways. Lock gates are included.			
Military camp	Military barracks and camps			
Military transport aircraft	Military-owned transport aircraft used to support military operations by airlifting troops and military equipment		x	Length, width
Minefield	Areas with landmines			
Missile system	Equipment for launching missiles		x	
Mobile artillery	Self-propelled artillery equipment		x	
Oil tank	Oil tanks		x	Volume
Pipeline	Pipelines			Diameter
Plane	Fixed-wing aircrafts, possibly with VTOL capabilities		x	Length, width
Pontoon bridge	Floating bridges			
Port	Maritime facilities comprising one or more wharves or loading areas, where ships load and discharge cargo and passengers			
Power station	Power stations of any types (fossil fuel, nuclear, solar, etc.)			

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Name	Definition	Involves change detection	Object	Characteristics
Radar antenna	Radar antennas		x	Diameter
Railway station	Railways stations including the station buildings and platforms, but not the tracks			
Railway	Railway tracks, including the area between the tracks in case of parallel tracks			
Road	Paved roads for transportation			
Ship	Surface watercrafts designed for carrying cargo or passengers, or for specialised missions, such as defence, research and fishing. Hovercrafts are not included.		x	Length, speed
Ship repair facility	Ship repair facilities			
Smoke	Smokes produced by human activities, including water vapor that cannot be confused with clouds.			Composition (various gases)
Soil	Ground that is not built or covered by vegetation			Humidity level
Storage and repair facility	Storage depots and maintenance facilities for such as weapons, fuel, food and vehicles			
Submarine	Watercraft capable of independent operation underwater		x	Length, speed
Surface-to-air missile system	Equipment for launching surface-to-air missiles		x	

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Name	Definition	Involves change detection	Object	Characteristics
Surface-to-surface missile system	Equipment for launching surface-to-surface missiles		x	
Tank	Armoured fighting vehicle		x	
Tent	Shelters consisting of sheets of fabric or other material draped over, attached to a frame of poles or a supporting rope		x	
Vegetation	Assemblage of plants covering ground			
Vehicle	Piece of equipment designed to transport people, cargo or both, on ground		x	
Vehicle trail	Unpaved lane in a natural area that can be used by motorised vehicles			
Water	Bodies of water, including wetlands and puddles			Depth (bathymetry)
Water Control Facilities	Dams, locks, and sluice gates			
Watercraft	Vehicle designed for travel across or through water bodies (boat, ship, hovercraft, submersible or submarine)		x	Length, speed