



Brussels, 11.4.2017
C(2017) 2262 final

COMMISSION DECISION

of 11.4.2017

**on the financing of the 'Preparatory action on Defence research' and the use of unit costs
for the year 2017**

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THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union,

Having regard to Regulation (EU, Euratom) No 966/2012 of the European Parliament and of the Council of 25 October 2012 on the financial rules applicable to the general budget of the Union and repealing Council Regulation (EC, Euratom) No 1605/2002¹, and in particular Articles 54(2)(b), 84(2) and Article 124 thereof,

Whereas:

- (1) In order to ensure the implementation of the 'Preparatory action on Defence research' ('the Preparatory Action') it is necessary to adopt a financing decision for 2017.
- (2) Testing the implementation of tasks by the European Defence Agency is one of the objectives of the Preparatory Action. To reach this objective, the Commission may use indirect management for the implementation of the 'Preparatory Action'.
- (3) The authorising officer by delegation has obtained evidence that the entity entrusted with the implementation of the budget by indirect management is fulfilling the requirements laid down in points (a) to (d) of the first subparagraph of Article 60(2) of Regulation (EU, Euratom) No 966/2012.
- (4) It is necessary to allow for the payment of interest due for late payment on the basis of Article 92 of Regulation (EU, Euratom) No 966/2012 and Article 111(4) of Delegated Regulation (EU) No 1268/2012.
- (5) Article 182 of Commission Delegated Regulation (EU) No 1268/2012² contains detailed rules regarding unit costs.
- (6) Simpler funding rules reduce the administrative costs for participation and contribute to the prevention and reduction of financial errors. In this respect, the use of unit costs is necessary to simplify the calculation of grant amounts, to significantly decrease the workload of both the beneficiaries and the Commission as well as to accelerate payment procedures.
- (7) The use of unit costs including personnel costs of SME owners and natural persons not receiving a salary should therefore be authorised for the activities co-funded under the Preparatory Action.
- (8) As the Preparatory Action addresses research, it will attract the same population of beneficiaries as the Horizon 2020 - the Framework Programme for Research and Innovation (2014-2020). For the sake of consistency and administrative simplification

¹ OJ L 248, 16.09.2002, p.1

² Commission Delegated Regulation (EU) No 1268/2012 of 29 October 2012 on the rules of application of Regulation (EU, Euratom) No 966/2012 of the European Parliament and of the Council on the financial rules applicable to the general budget of the Union (OJ L 362, 31.12.2012, p. 1)

for the beneficiaries, as far as possible, the same rules should be applied to the Preparatory Action as in Horizon 2020 programme. It is therefore appropriate to allow for the reimbursement of indirect costs at a flat rate of 25% and for the application of the same unit costs for the SME owners and natural persons not receiving a salary as under the Horizon 2020 programme.

- (9) For the application of this Decision, it is appropriate to define the term 'substantial change' within the meaning of Article 94(4) of Delegated Regulation (EU) No 1268/2012.

HAS DECIDED AS FOLLOWS:

Article 1

This decision constitutes a financing decision for the actions in Annex 1 concerning the activity 'Preparatory action on Defence research' (02.047703).

Article 2

The maximum Union contribution for the implementation of the programme 2017 is set at EUR 25.000.000, and shall be financed from the appropriations entered in the following line of the general budget of the Union for 2017:

budget line 02.047703: EUR 25.000.000.

The appropriations provided for in the first paragraph may also cover interest due for late payment.

Article 3

The budget implementation tasks related to the action carried out by way of indirect management, as set out in Annex 1, may be entrusted to the entity referred to in point 1.3 of that Annex.

Article 4

Personnel costs of the owners of SMEs participating in actions of the 'Preparatory action on Defence research' who do not receive a salary, and other natural persons who do not receive a salary, may be reimbursed on the basis of a unit cost under the conditions set out in Annex 2.

Direct eligible personnel costs of entities participating in the 'Preparatory action on Defence research' may be reimbursed on the basis of unit costs determined according to the beneficiary's usual cost accounting practices under the conditions set out in Annex 2.

Article 5

The indirect eligible costs of the grants awarded under the 'Preparatory action on Defence research' shall be determined by applying a flat rate of 25 % of the total direct eligible costs, excluding direct eligible costs for subcontracting.

Article 6

Cumulated changes³ to the allocations to specific actions not exceeding 20% of the maximum contribution set in Article 2 of this Decision shall not be considered to be substantial within the meaning of Article 94(4) of Delegated Regulation (EU) No 1268/2012, where those changes do not significantly affect the nature of the actions and the objective of the work programme.

The authorising officer responsible may apply the changes referred to in the first paragraph. Those changes shall be applied in accordance with the principles of sound financial management and proportionality.

Done at Brussels, 11.4.2017

For the Commission
Elżbieta BIEŃKOWSKA
Member of the Commission

³ These changes can come from assigned revenue made available after the adoption of the financing decision.



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ANNEXES 1 to 2

ANNEXES

to the

Commission Decision

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Annex 1. Preparatory action on Defence research - Work Programme for 2017

1.1. Introduction

The main objective of the Preparatory action on Defence research is thus to prepare and test mechanisms that can prepare, organise and deliver a variety of EU-funded cooperative defence research and technology development (R&T) activities to improve the competitiveness and innovation in the European defence industry and to stimulate cooperation amongst R&T actors in all Member States.

The focus of the Preparatory action on Defence research is on defence rather than dual-use; nevertheless it will be complementary with existing EU programmes such as the Specific Challenge "Secure societies – Protecting freedom and security of Europe and its citizens" under Horizon 2020 as well as R&T activities in the Member States and in the European Defence Agency (EDA).

EU funding in the context of the Preparatory action on Defence research can only be used for R&T activities related to defence technologies, products and systems, and not to fund military operations.

On the basis of the objectives given in the 2017 budgetary remark for Item 02 04 77 03 — 'Preparatory action on Defence research' this work programme contains the actions to be financed and the budget breakdown for year 2017 as follows:

- | |
|--|
| <ul style="list-style-type: none">- for procurement (implemented under direct management) (1.2): EUR 350.000- for actions implemented in indirect management (1.3): EUR 24.500.000- for other actions or expenditures (1.4): EUR 150.000 |
|--|

1.2. Procurement

1.2.1 Study to support the monitoring of the implementation of the 'Preparatory action on Defence research'

The overall budgetary allocation reserved for procurement contracts in 2017 amounts to EUR 350.000.

Monitoring the 'Preparatory action on Defence research'– design study for a future EU defence research programme

Legal basis

Preparatory action on Defence research

BUDGET LINE

Item 02 04 77 03

Subject matter of the contracts envisaged

Study to support the monitoring of the implementation of the 'Preparatory action on Defence research' and to advice on the design, structure of governance, modalities and implementation options of a future EU defence research programme.

Type of contract (*new FWC / direct contract / specific contract based on an existing FWC / contract renewal*) and type of procurement (*service/supply/works*)

Direct contract or specific contract based on an existing FWC, service.

Indicative amount per contract

EUR 350.000

Indicative number of contracts envisaged: one (1)

Indicative timeframe for launching the procurement procedure

Procurement procedure to be launched in April 2017

Implementation

The action will be directly managed by DG GROW. A service contract shall be awarded through an open call for tenders or the use of an existing FWC.

1.2.2 Dissemination activities expenses related to the 'Preparatory action on Defence research'

Legal basis

Preparatory action on Defence research

Budget line

Item 02 04 77 03

Amount

EUR 100.000

Description and objective of the implementing measure

Procurement of goods and services related to information activities and publications directly linked to the achievement of the objectives of the action or measures falling under this item, dissemination activities and relevant work which may lead to the preparation of a proposal for a future European defence research programme under the next Multiannual Financial Framework. Not more than 5 contracts (direct contracts or specific contracts under framework contracts) are expected to be awarded in Q4 2017.

1.3. Actions implemented in indirect management

Management of actions (research projects) on behalf of the EU

Legal basis

Preparatory action on Defence research

Budget line

Item 02 04 77 03

Amount

EUR 24.500.000

Implementing entity

This action shall be implemented by the EDA through a delegation agreement to be signed between EDA and the Commission on behalf of the European Union in 2017. The choice of the Agency for the delegation agreement is justified by its knowledge and its recognised experience in the organisation and management of research projects and programmes in the area of defence, its unique role in the EU and its experience from the implementation of the Pilot Project in Defence research in 2015 and 2016, in preparing and launching the call for proposals, organising the evaluation of the proposals, signing the grant agreements, monitoring and controlling the progress of the projects. The Commission wants to further test this mode of management in this area and assess the capability of the Agency to undertake the implementation of the work programmes of a future defence research programme by applying additional practices and instruments to increase the efficiency, transparency and accountability of the implementation phase. Actions regard in particular the introduction of the IT tools used for the management of Horizon 2020 projects, the establishment of a database of evaluators of the proposals through an open call, the introduction of an ethical scrutiny of the proposals and the establishment of a detailed framework for the treatment of EUCI¹.

The Commission shall closely monitor the implementation of the entrusted tasks, through regular reporting and meetings with EDA. The Commission shall provide to EDA the technical description of the topics as set out in Appendix to the present Annex² and the rules for participation of the action, in line with the requirements of the Financial Regulation. The Commission will approve the evaluation results and have the right to ask for clarifications and

¹ EU Classified Information

² The topics and the technical descriptions were defined in close coordination with technical experts from the Ministries of Defence of all the EU Member States

modifications when necessary at any part of the implementation phase.

Overall objective and purpose of the action

The Agency will run a limited number of actions on behalf of the Union in the following areas:

- One action (technology demonstrator) in the area of enhanced situational awareness in a naval environment.
- One or more actions concerning research in technologies and products in the context of force protection and soldier systems.
- One action to develop a methodology and perform a strategic technology foresight.

The detailed description of these actions is provided in the Appendix of the present Annex.

The funding of the action shall be done through the award of grants to consortia after the publication of calls for proposals. EU funding may reach 100% of the total eligible costs. Indirect costs shall be determined in accordance with article 5 of this decision. The award of the grants is expected for early 2018 and the duration of the projects is expected to be between 12 and 36 months. The proposals shall be evaluated on the basis of the following award criteria: (a) excellence, (b) impact and (c) quality and efficiency of the implementation. Entities from all the EU Member States and Norway³ shall be eligible to apply.

The Agency shall be allocated 5% of the final amount of the eligible costs incurred under the actions to cover expenditure related to the management of the relevant tasks.

1.4. Other Actions or expenditures

Experts support expenses related to the 'Preparatory action on Defence research'

Legal basis

Preparatory action on Defence research

Budget line

Item 02 04 77 03

Amount

EUR 50.000

Description and objective of the implementing measure

³ Subject to amendment of Protocol 31 to the EEA Agreement

An expert group composed by governmental experts in defence shall provide support to the Commission for the implementation of the 'Preparatory action on Defence research' on aspects related to the content definition, the governance and the modalities, including aspects related to the assessment of the action. Ad hoc working groups may be set up in order to provide advice on specific technical aspects, including for issues related to the security and the treatment of classified information. Support shall extend to technical and administrative assistance from individual experts.

Appendix 1 to Annex 1. Detailed description of the actions - 2017

1. Unmanned Systems

Unmanned systems have an increasing significance for defence worldwide. Within the context of the Preparatory action on Defence research (PADR), research can be supported on unmanned systems which are applicable to all defence domains (air, land and maritime), which enable enhanced safety, survivability and effect and include stand-alone or swarm operation and interoperability with manned platforms. Where relevant, aspects of self-protection should be addressed.

Proposals are invited against the following topic:

Technological demonstrator for enhanced situational awareness in a naval environment

Specific Challenge:

In a defence context, naval forces are engaged permanently, including in various types of conflicts, asymmetric or symmetric. They must control their environment in order to scan, detect and analyse as soon as possible the intentions of other forces and potential threats, in order to retain capacity of initiative, freedom of movement and to achieve the desired end-effect. In this respect, maritime Intelligence, Surveillance, Target Acquisition and Reconnaissance (ISTAR), complemented with neutralisation capacities, is a key capability from a strategic or tactical perspective. The ISTAR chain is a critical enabler to the common Recognized Maritime Picture (RMP), for detection, identification, tracking and target acquisition, as well as for strengthening interoperability.

Remotely Piloted Aircraft Systems (RPAS) and other unmanned systems (UXS, in which "X" can stand for "Aerial", "Surface" or "Underwater") operated alongside other unmanned and manned systems can thereby provide significant added value to enhance such situational awareness. Yet efforts are needed for extending, amongst other parameters, the persistence, range and coverage in particular of UAS.

The integration of data from multiple sources operating in a complementary way, and the quality and capability to exchange data in real (or near real) time is needed to improve the interoperability between manned and unmanned systems within existing, multilateral EU defence systems and infrastructures, and with naval platforms and mission systems.

Scope: Enhanced situational awareness in naval operations critically depends on the quality of (a) the sensor suite and (b) the exploitation/sharing of gathered data. Major potential for substantial improvements and step-up exist in these two domains:

- (a) as far as the sensor suite is concerned, a more extensive integration and use of unmanned systems offering enhanced performances and capacities compared to commercially available state-of-the-art assets, and operated in a complementary way with other types of platforms and sensors;

- (b) concerning data exploitation and sharing, potential for improvements are linked in particular to the real time or near real time and secured transfer of data.

This topic calls for proposals that convincingly remove technological obstacles, and combine innovation and integration, in order to demonstrate that situational awareness in a naval environment can be significantly improved.

In this context, technology demonstrations in two types of operational situations should be prioritised:

- Persistent Wide Area Surveillance;
- Maritime Interdiction Operations.

These operations cover the first phases of all naval operations conducted from naval ships or vessels. Although these operations might take on maritime security dimensions, they also need to cover genuine defence specific requirements. Specific maritime ISTAR assets are linked to the environment in which systems or equipment are operated such as:

- Environmental conditions are in particular related to adverse weather, high sea levels, or day and night operations;
- Strong electromagnetic fields (aspects of electromagnetic compatibility (EMC) and interference (EMI)), jamming or rupture of communications;
- Deployment in contested environment implies also stealthy and survivability requirements;
- The type of data to be exchanged requires levels of protection appropriate to defence-classified data. Moreover, for the needs of the missions, real time, or near real time exchange and transfer of data are necessary.

The objective of the technological demonstrator is to mature and bring technologies together, for enhancing situational awareness through unmanned systems working alongside manned systems in various complex and extreme environmental circumstances. On the one hand, the focus will be on the integration of RPAS or other UXS into naval systems (ship interface & combat management system). On the other hand, considering various types of unmanned systems – e.g. aerial, surface and/or submersible platforms – the focus will be on the transfer of relevant military data and fusing of this data with complementary data from space platforms or manned systems.

These two work-strands shall be conducted in a consistent manner, with the high level objective to improve situational awareness and provide a comprehensive picture of an operational situation enabling management of own assets, monitoring movement, and detection of threats in a contested environment that requires protective measures for cyber defence, electronic warfare, GPS-denial and platform/payload survivability.

More specifically, proposals should balance R&T efforts in the following two areas:

a) Integration in naval systems of close-to-market new or improved existing platforms demonstrator with improved sensors capacity, persistence and autonomy

Taking into account the necessity of increasing ISTAR in high sea naval operations, the use of RPAS or other UXS as platforms with appropriate payloads that would allow the use of improved sensors is expected to constitute a major asset in future capabilities.

Substantial technological progress is needed to develop RPAS or other UXS solutions which would be operated from navy ships and meet a number of defence specific requirements: payload capacity (several types of sensors, at least 2 major sensors on-board, persistence, endurance and range, autonomy and optimisation of operators work-load, EMC/EMI compatibility, operations (including launch and recovery) at sea from navy ships under extreme conditions, survivability, etc.

To achieve the desirable (and affordable) compromise between needs and solutions, and in terms of payload vs. platform, efforts are needed to remove technological obstacles concerning platform technologies, technologies related to the integration into military ship environment, payload and sensors architecture-related technologies, control systems and handling quality, autonomous operation, as well as security aspects.

The project should not aim at developing a new platform but focus on developing key technologies while using existing platforms, as a basis for developing this work strand of the project as well as for the demonstration testing.

Proposals would address aspects such as:

- Platform protection in contested environments;
- Anti-jamming and electronic counter-measures;
- Capability to be launched and recovered from manned platforms also in severe meteorological conditions (objective: up to Sea State 5);
- Autonomy motivated by the need to reduce manning, risk and cost of platform operation. Examples include: Autonomous piloting, anti-collision, automated replanning and execution, adaptive behaviour, automated fault management systems, local automated sensor processing, local situation awareness without man-in-the-loop, automatic launch and recovery;
- Navigation need for accurate positioning and for establishing redundancy to GNSS;
- High speed secure and real time or near real time communication including cyber protection;
- Operation of the platform under severe climatological conditions;
- Operation of the platform from navy ships under severe sea state conditions;
- Improved sensors and payload capacity;
- Capability of the platform to transport cargo/utility and to drop payloads;
- If relevant, optionally piloted capability to allow maximum flexibility for larger types and demonstrate interaction and operational flexibility between manned, unmanned, optionally manned vehicles. The compatibility with STANAG 4586 (NATO UAV Control System), 4545 (NATO Secondary imagery format), 4609 (NATO Digital Motion Imagery Standard) should be ensured.

Proposals should underline the impact of new or improved existing platforms and of their technological content on, e.g., endurance, range, autonomy, payload capacity and trade-off between size/weight and performances, enhanced sensors performance, resilience and redundancy of Command and Control links and data links.

b) Demonstration of integration of data from multiple sources in a single predefined tactical picture

The demonstration should aim at evaluating the capability of a Maritime Operation Center (MOC) to acquire, exploit, correlate, analyse and disseminate securely sensor data and integrate it into a RMP in Near Real Time (NRT), making use of the current state of the art satellite imagery, Automatic Identification System (space and coastal), naval vessel, manned and unmanned systems.

The integration of data from those multiple sources should improve ISTAR in a single predefined tactical picture allowing faster, independent and more accurate use of combat systems of the naval military systems.

Concerning the data exchange, the main challenge should be placed on the capability to exchange data and ability to switch quickly between classified and unclassified channels with cyber issues. Data can be gathered by sensors on-board the UXS but also from a wider scope of sensor types and assets. Also progressing on the near real-time transmission (a datalink allowing full motion video in particular) remains an important challenge.

In addition, the demonstration may include the use of homogeneous or heterogeneous groups, i.e., mixing UAV with manned fixed and/or rotary wings, USV and/or UUV), equipped with different types of sensors.

Proposals should address aspects such as:

- Determination of data exchange systems C4ISR;
- Multi sensor information fusion;
- Data request for area / time of interest;
- Data analysis, exploitation and visualisation;
- Operation planning and control;
- Integration and interoperability with the vessel command and control (CMS) or a MOC;
- Integration of sensor information provided by Member States (CISE, MARSUR);
- Analysis of data requests (satellite, unmanned and manned aerial and naval systems);
- High level of data processing integration, on board vehicle and possibly off board;
- Close to real-time transmission (datalink allowing e.g. full motion video) and data fusion with long term history assessment and detection of anomalies;
- Encryption and cyber security for exchange of classified information;
- Simulation aspects for operators.

Proposals should underline (i) the improved interaction/coordination between (semi-) autonomous platforms and man-machine interaction and interface issues, (ii) improved quality of situational awareness compared to that provided by traditional assets (higher quality at lower risk and cost), (iii) impact in reduction of human involvement in operation. Proposals should also demonstrate that naval combat management systems will maximise the exploitation of the potential of unmanned systems through the development of a shared situational awareness. NATO-EU interoperability will be important in that regard as well as interoperability with civil systems if appropriate.

Proposals should therefore also include aspects such as:

- Common architecture of mixed unmanned systems (aerial, surface, underwater) together with communication within the common systems architecture;
- Common Information Exchange Infrastructure based on NATO compliant interfaces as a trusted system to allow to share and retrieve information with different levels of security;
- Swarming behaviours and impact on automated vehicle behaviours and collision avoidance;
- Exchange of specific information regarding target designation;
- Anti-Area/Access-Denial (A2/AD) technologies offset;
- (Service oriented) architecture open to air and land component to build a European C4ISTAR joint/combined system, reconfigurable during runtime;
- Simulation environments for support design, validate solutions, train operators.

The activities of the project should focus mainly on maturing and integrating validated technologies. Part of the project can be carried out by using computer-based modelling and simulation tools, to allow de-risking of the demonstration. Moreover, the project shall provide a full-scale technological demonstration at least in a relevant environment of mixed manned/unmanned assets. If deemed appropriate, the proposal could include a demonstration in an operational environment, e.g., in conjunction with armed forces⁴.

The proposal should include a high level description of the key performance indicators (KPIs) for the envisaged functionalities and the methodologies on how to measure them. A report with a detailed description of these KPIs and methodologies in view of the demonstrations should be delivered within 6 months after the start of the project.

The implementation of this topic is intended to start at TRL 4 and target TRL not lower than 6 and not higher than 7.

The Commission considers that proposal requesting a contribution from the EU between EUR 32 and 36 million would allow this specific challenge to be addressed appropriately.

⁴ A list of EU Member States armed forces that expressed their willingness to facilitate (part of) the demonstration activities can be found for information at <https://www.eda.europa.eu/procurement-biz/procurement/eda-grants>. There is no obligation for applicants neither to use nor to restrict themselves to the organisations contained in this list.

Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Given the constraints on the yearly budget of the Preparatory Action, full proposals should include upon a single submission the description of (i) a core part which would need a EU contribution between EUR 14 and 16 million from the 2017 budget, and (ii) up to 4 additional research modules with a EU contribution of up to EUR 5 million each that would extend the core project to cover the topic more substantially. These research modules can receive funding from the 2018 budget subject to the adoption of the 2018 financing decision on the preparatory action and subject to the approval of the budget by the EU budgetary authorities. The proposals, including the total indicative budget of the core part and all additional modules will be evaluated in their entirety during a single-stage evaluation procedure.

No more than one action will be funded.

Expected Impact:

- Convincing demonstration of the potential of EU-funded research for defence applications;
- Reliable operation of the proposed solutions in various, complex and extreme maritime environments;
- Substantial gain towards autonomous and safe operation of UXS from navy ships offering suitable potential in term of payload capacity, range and handling quality for operations under adverse conditions;
- Enhancement of maritime situational awareness and command and control capability and secured data exchange and real time or near real time transmission of information;
- Development of the European industrial capability in the market segment of unmanned systems for defence capabilities;
- Improved interoperability between manned and unmanned systems;
- Improved interoperability with existing, multilateral EU defence systems and infrastructures, and with naval platforms and mission systems;
- Extended capabilities of a vessel platform, fully integrated with the vessel mission system (CMS and sensors);
- Improved efficiency and cost-effectiveness;
- Informing the shape of future military structures in view of the use of advanced unmanned systems.

Proposals should include a first demonstration of preliminary yet meaningful results during late 2019 (and in any event not before mid-2019) with the second and final demonstration during mid-2020. It is anticipated that both demonstrations should be alongside existing military platforms. The participation of SMEs in the proposal, if relevant, is strongly encouraged and this will be positively evaluated under the “Implementation” criterion.

2. Research in technology and products in the context of Force Protection and Soldier Systems

Protective equipment for soldiers needs to provide solutions against an increasing variety of threats such as bullets, fragments, flame and flash, noise, laser, detection, CBRN, effects of blast, environmental threats such as hot or cold climates, non-ballistic threats such as blunt trauma, load-carrying systems, small arms and ammunition, communication and improvised explosive devices (IED), optics and sensors are imperative. But single technology solutions to single problems are not ideal. Moreover, additional factors, beyond the functionalities of their equipment, need to be taken into account, in particular cost efficiency.

In the context of the Preparatory Action, the Strategic Cluster on Force Protection and Soldier Systems focuses on research and technological developments related to soldier systems, thereby covering progress beyond the state of current programmes, concentrating on the integration of systems, modularity and other ways to increase soldiers' mobility.

Proposals are invited against the following topic(s):

Force protection and advanced soldier systems beyond current programmes

Specific Challenge:

Soldier equipment will increasingly have to meet and adapt to the requirements stemming from their future application in multinational, less and less predictable and very dynamic environments. This introduces important challenges to soldier systems, such as:

- Interoperability of defence systems will be a key capability in the future. For Land Defence Systems, interoperability of vehicles, infrastructures and soldier systems will be based on open standards and joint architectures. This introduces important challenges to soldier systems, such as multi-national interoperability, effectiveness, adaptability to mission and mission intensity, maintaining equipment at state of the art, life cycle cost efficiency, logistic and human resource footprint of force protection.
- The safety of military personnel is a critical element of effective defence and security. The defensive measures as individual ballistic protection remain vital. The current ballistic protection systems for the soldiers are mainly based on the fibre technology and hard materials technology, where high-performance fibres and hard materials (and their combinations) are manufactured into 2D and 3D assemblies to retard the ballistic threat. New solutions and materials like shear-thickening fluids are being implemented into body armour production, but still not in a commercialisation phase. Despite the efforts in the research area (most of them outside the EU), the shortcomings of commercially available products exist. The main disadvantage of the commercially available ballistic systems is their weight – average weight to area ratio for level IIIA (according to the NIJ Standard) remains about 6 kg/m^2 , for level III is approximately 20 kg/m^2 , for IIIA+ is close to 30 kg/m^2 , and for level IV about 42 kg/m^2 . The inflexibility and design shortcomings to differences in anatomy and protection approaches

based only against kinetic energy threats are also important challenges. In this respect, blast protection needs to take into account the use of CBRN agents together with ammunition, explosives or IEDs and the need to detect and protect soldiers from such elements.

- A strong civilian driving force encourages research and development in order to adapt visible appearance. Materials and components exist or are being developed to change the visual appearance of a surface for e.g. display applications. These are, in general, not suited for defence applications. Present and future threats from advanced sensor systems have been analysed. Advanced materials and structures for high-resolution spectral design are developed at universities and industry without knowledge of defence specific requirements. For longer (invisible) wavelengths no such civilian demand exists. Adaptive materials, structures and components in short wave infrared, thermal infrared and radar require specific research. Such adaptive technologies must be compatible with defence specific requirements on endurance and operability.

Scope:

The topic calls for proposals to explore and demonstrate the potential of how technology can further advance and enhance soldier systems beyond current programmes, hence assessing what is the state-of-the-art in one or more of the aforementioned areas. Proposed activities could cover one of the following sub-topics:

(a) Generic open soldier systems architecture

The proposals should propose a definition of architecture ready for standardisation and comprehensively covering soldier systems within their context of operation (group, squad, multi-national, vehicles, etc.). The architecture domain to be considered shall include:

- electronics;
- voice and data communication;
- software;
- human interface devices;
- sensors;
- effectors.

The architecture shall be based on a suitable architectural framework. At the end of the project a technical validation should be performed to ensure that a proposed architecture in terms of interfaces, protocols or standards is technically feasible and to enable delivery of an open, modular and easily reconfigurable soldier system.

Results from relevant NATO (STANAG 4677, STANAG 4619, STANAG 4695, STANAG 4740) and EDA (STASS I & STASS II) activities and studies should be used as baseline for the development of generic open soldier system reference architecture.

(b) Tailor-made blast, ballistic and CBRN protection of military personnel

The proposals should aim at research and technology development in lightweight ballistic and blasting protection allowing reduction at least 20% of weight versus existing commercial solutions for military personnel. The technology should allow achieving optimized protection with effective dissipation of energy and body protected zones. It should enable flexibility and modularity. Proposals should also explore the use of novel materials to integrate CBRN detection and/or protection into military body armour. Relevant advancements in manufacturing techniques, such as 3D printing, might also be investigated.

The activities included in proposals submitted under this sub-topic should clearly differentiate from or go beyond work already covered under Horizon 2020, in particular by the Specific Challenge "Secure societies – Protecting freedom and security of Europe and its citizens".

(c) Adaptive camouflage

Advanced active and passive camouflage methods which are able to rapidly reconfigure or change to various patterns according to the surrounding environment. The camouflage should be active against a variety of present and future threats from advanced sensor systems and observation means, adapted to the needs and the variety of missions of the military users.

Activities are expected to focus on TRL 2 to 3 (for subtopic (a)) and TRL 2- to 4-5 (for subtopics (b) and (c))

The European Commission considers that proposals requesting a contribution from the EU in the range of EUR 1 to 1.5 million for subtopic (a) and EUR 2 to 3 million for subtopics (b) and (c) would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected Impact:

- Convincing demonstration of EU-wide research cooperation in defence research;
- Promotion of the integration of interoperability standards;
- Enhancement of the effectiveness of military personnel;
- Reduction in life cycle costs.

3. Strategic Technology Foresight

Europe needs to absorb emerging technologies as quickly as possible in military products and services. Rapidly evolving technological innovation, in civil and defence environment and on a global scale therefore calls for a mechanism to identify key trends and developments. The Preparatory Action on Defence Research will therefore include actions to develop a sustainable strategic technology foresight methodology. In view of the reform of the International Traffic in Arms Regulations (ITAR), an important part in this Area would be to launch a stocktaking exercise of ITAR related components in Europe's armament systems, including in future technologies.

In the context of the development of the future EU-funded defence research programme, these analyses should suggest potential themes, draft initial trends and business models, leading to scoping EU-funded defence research based on scenarios illustrating potential future conflicts.

Proposals are invited against the following topic:

The European Defence Research Runway

Specific Challenge:

The current time period is characterised by rapid changes in many domains – geopolitical, economic, environmental and technological – which have huge effects on the global security situation. For the EU and for EU Member States it is therefore essential to continuously perform strategic technology foresight analyses so as to gain understanding of important trends and their defence and security implications. Essential parts of strategic technology foresight analysis are Horizon Scanning and Technology Watch (HS&TW): the signalling of emerging threats, the identification of emerging technologies and potential opportunities combined with a broad analysis of relevant technological developments. Performing a strategic technology foresight is challenging, not only because it is an activity aimed at a “moving target”, but also because it is not easy to identify and track the wide range of relevant technologies to be addressed in view of:

- the added value of a common European approach in properly covering the full range of technologies and sources;
- the need to build a common understanding of future technology and its impact on defence trends in order to plan and coordinate accordingly our actions;
- the need for an innovative approach with respect to the way these activities traditionally are conducted;
- the growing relevance of the civil technologies for defence and the need to include the developments in the civil sector in the exercise;
- identifying new technologies.

Scope:

This action should aim to support strategic technology foresight in the defence domain of individual Member States and of the EU as a whole by performing joint technology foresight activities supported by methodologies such as horizon scanning, technology watch, scientometric tools, expert consultation activities. The action should focus in particular on identifying emerging defence research areas for potential exploration in the next Multi-annual Financial Framework. The action should propose and validate a methodology and process for strategic technology foresight activities to be carried out cyclically. Such a methodology should take into account similar activities conducted in EDA, NATO and other military and/or civil organisations. Activities that should be considered could include, amongst others:

- Collection of information (national sources, EU research programme, occidental and non-occidental sources);
- Analysis (geopolitical trends, defence and security trends, technology, industrial trends);
- Engagement with European industry trade bodies;
- Evaluation/assessment for defence and security (future scenario-based evaluations such as Disruptive Technology Assessment Games, consultations

of technology and military experts, input from “unconventional” groups with an outside view, more creative thinking, ...);

- Defining and setting up strategic trends for the medium and long term;
- Management and controlled dissemination of results (secure web-based access with public and restricted dissemination).

The strategic technology foresight should be coupled to a process and method for scoping EU-funded defence research based on scenarios to illustrate potential future conflicts.

Proposals should include elements to ensure continued monitoring and updating beyond the action's lifetime.

The European Commission considers that proposals requesting a contribution from the EU in the range of EUR 0.8 to 1.0 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

No more than one action will be funded.

Expected Impact:

The action should allow to

- underpin coordination of defence research activities at the EU and national level;
- prepare the long term agenda for defence research in the EU;
- explore themes for a future European Defence Research Programme;
- underpin coordination of agendas and optimisation of synergies between the EU defence and civil research activities under the next Multiannual Financial Framework;
- test the approach through proposing topics for the Future Disruptive Technologies technology area in the last year of the PADR.

4. Other actions

External Expertise

This action will support the use of appointed independent experts for the evaluation of proposals and monitoring of running projects, where appropriate.

Type of Action: Expert Contracts

Indicative budget: EUR 0.1 million from the 2017 budget

Annex 2. On the reimbursement of personnel costs of beneficiaries

Introduction

In order to simplify the declaration and verification of costs of beneficiaries under the Preparatory action on Defence research (PADR), this decision authorises the reimbursement of personnel costs declared as unit costs on the basis of beneficiaries' usual accounting practices and the reimbursement of personnel costs of SME owners who do not receive a salary declared as unit costs. It further lays down methods to determine annual productive hours and hourly rates.

1. Rationale for the reimbursement of personnel costs declared as unit costs

(1) Experience from the Horizon 2020 Programme

Based on experience drawn from the implementation of the Horizon 2020, the use of unit costs would facilitate the implementation of the PADR for the following reasons:

Majority of beneficiaries have long established systems for the use of unit costs declared on the basis of the beneficiary's usual cost accounting practices for direct personnel costs;

- Use of unit costs will bring a simplification and reduce administrative burden for all concerned parties.

(2) The specific case of SME owners who do not receive a salary

SMEs are expected to participate in actions funded under the PADR. It should thus be possible to provide support for the work carried out by SME owners who do not receive a salary. However, in the absence of a salary, there is no actual cost recorded in the accounts of the beneficiary related to the work of these persons. This leads to the EU being incapable of co-financing such work which is otherwise real and necessary for the implementation of an action. The use of unit costs to support SME owners who do not receive a salary carried out in EU funded actions in accordance with Article 124(5) of Regulation (EC, Euratom) No 966/2012 would allow overcoming this difficulty.

Therefore, costs related to the work of SME owners who do not receive a salary shall be declared on the basis of unit costs in grants awarded under the PADR taking the form of reimbursement of eligible costs.

Research related actions are addressed under both the PADR and the Horizon 2020 programme, which attract the same population of beneficiaries. For the sake of consistency and administrative simplification for the beneficiaries, the same rules should be applied to the same beneficiaries which may receive funding under both programmes.

Reduction of risk

The use of unit costs will reduce the risk of irregularities, overstatements and fraud since personnel costs will be calculated according to established formulas set out in point 2. In addition, it will also contribute to the objective of simplification and cost-effectiveness of controls.

2. Methods to determine and update the amounts

2.1. Unit costs determined according to the beneficiary's usual cost accounting practices

Beneficiaries may declare eligible costs for the work carried out under the action for all categories of personnel, other than SME owners and natural persons not receiving a salary, using unit costs determined according to the beneficiary's usual cost accounting practices using annual productive hours.

Eligible staff costs shall be calculated according to the following steps:

STEP 1: Determine actual annual personnel costs for the year, as recorded in the beneficiary's accounts, excluding ineligible costs, costs included in other budget categories, and costs covered by other forms of grant (where applicable), in particular any indirect costs and provisions.

"Personnel" means staff working under an employment contract (or equivalent appointing act) assigned to the action, under the conditions set in the grant agreement. The personnel costs must be limited to salaries (including during parental leave), social security contributions, taxes and other costs included in the remuneration, if they arise from national law or the employment contract (or equivalent appointing act). Personnel costs may also cover additional remuneration of personnel, the costs for natural persons working under a direct contract and the costs of personnel seconded by a third party against payment.

Calculating the actual annual personnel costs must be done according to the participant's usual cost accounting practices, provided that they comply with the following cumulative criteria:

they are calculated on the basis of the total actual personnel costs recorded in the participant's general accounts for the personnel carrying out work for the action; this may be adjusted by the beneficiary on the basis of budgeted or estimated elements;

the cost accounting practices are applied in a consistent manner, based on objective criteria independent from the source of funding;

they ensure compliance with the non-profit requirement and the avoidance of double funding of costs.

Among the boundary conditions to be applied, beneficiaries must ensure that the costs declared can be directly reconciled with the amounts recorded in their general accounts.

STEP 2: Determine a person's 'annual productive hours', for which beneficiaries may choose among 3 options:

- (a) On the condition that either the contract of employment, or the applicable collective labour agreement, or the national working time legislation allow to determine the annual workable hours, the total number of hours worked by the person in the year for the beneficiary calculated as follows:

$\text{Annual productive hours} =$ $\{ \text{annual workable hours of the person} \} \text{ plus } \{ \text{overtime worked} \} \text{ minus } \{ \text{absences} \}$

- *annual workable hours* means the period during which the personnel must be working at the employer’s disposal and carrying out his/her activity or duties under the employment contract, applicable collective labour agreement or national working time legislation;
 - *absences* means for example trainings, sick leave and special leave.
- (b) The ‘standard number of annual hours’ generally applied by the beneficiary for its personnel in accordance with its usual cost accounting practices. This number must be at least 90% of the ‘standard annual workable hours’.
- If there is no applicable reference (i.e. employment contract, collective labour agreement or national law) for the standard annual workable hours, this option cannot be used.
- (c) 1 720 hours for persons working full time (or corresponding pro-rata for persons not working full time).

For all options under (a), (b) and (c), the actual time spent on parental leave by a person assigned to the co-funded action may be deducted from the number of annual productive hours.

The total number of hours declared in EU or Euratom grants, for a person for a year, cannot be higher than the annual productive hours used for the calculations of the hourly rate. Therefore, the maximum number of hours that can be declared for the grant are:

{ number of annual productive hours for the year minus total number of hours declared by the beneficiary, for that person for that year, for other EU or Euratom grants }.

STEP 3: Determine the hourly rate for a person (the 'unit cost') as follows:

actual annual personnel costs for the person for the year
divided by
number of annual productive hours.

The beneficiaries must use the annual personnel costs and the number of annual productive hours for each financial year covered by the reporting period concerned. If a financial year is not closed at the end of the reporting period, the beneficiaries must use the hourly rate of the last closed financial year available.

STEP 4: Multiply the hourly rate (the 'unit cost') with the number of actual hours worked on the action.

The number of actual working hours declared for a person must be identifiable and verifiable; they must be necessary for implementing the action and must be actually used during the action. Evidence regarding the actual hours worked shall be provided by the participant, through a time recording system for which the minimum requirements are set out in section 2.3.

2.2. Unit costs for SME owners and natural persons not receiving a salary

The direct personnel costs of **SMEs owners not receiving a salary** shall be based on a unit cost per hour worked on the action to be calculated as follows:

{Monthly living allowance fixed at EUR 4 650 multiplied by the country-specific correction coefficient as set out in the Appendix} divided by 143 hours

The value of the work of the SME owners not receiving a salary shall be determined by multiplying the unit cost by the number of actual hours worked on the Action.

The standard number of annual productive hours per SME owner is equal to 1 720 hours. The total number of hours declared, in a year, in EU and Euratom grants for one SME owner not receiving a salary may not be higher than the standard number of annual productive hours (1 720 hours).

2.3. Time records

The time recording system should record all working time including absences and may be paper or electronically based. The time records must be approved by the persons working on the action and their supervisors, at least monthly. The absence of an adequate time recording system is considered to be a serious and systematic weakness of internal control.

As an exception, for persons working exclusively on the co-funded action, there is no need to keep time records, if the beneficiary signs a declaration confirming that the persons concerned have worked exclusively on the action, or it is clearly indicated in their contract of employment (or equivalent appointing act).

3. No-profit and co-financing principles and absence of double financing

The conditions for reasonably ensuring that the no-profit principle is complied with are:

The calculation method of unit costs is based on the actual costs recorded on an annual basis in the beneficiary's accounts;

The unit cost covers only a part of the eligible costs;

The absence of profit will be verified at the time of payment of the balance according to the conditions stated in each grant agreement.

The conditions for reasonably ensuring the absence of double funding are:

The specification/identification of the categories of eligible costs subject to the unit cost; Ex-Ante and Ex-Post controls may verify the declaration of hours / units across several funded actions in order to ensure there is no abuse of the number of hours for individuals declared in a given action.

Compliance with the co-financing principle will be ensured by application of a co-financing rate laid down in each grant agreement to the amount of the eligible costs.

Verification of compliance with the above principles for the funding on the basis of unit costs of the work carried out by SME owners not receiving a salary is limited, since the value of their work are not personnel costs borne by the beneficiaries. This exception is foreseen by Article 124(5) of Regulation (EC, Euratom) No 966/2012.

APPENDIX: Country correction coefficient

Country Code ⁵	CCC
AT	104.8%
BE	100.0%
BG	71.5%
CY	91.8%
CZ	83.8%
DE	98.8%
DK	135.3%
EE	78.3%
EL	92.7%
ES	97.6%
FI	116.6%
FR	111.0%
HR	97.5%
HU	76.2%
IE	113.5%
IT	106.7%
LT	73.1%
LU	100.0%
LV	75.9%
MT	89.6%
NO	131.9%
NL	104.3%
PL	76.4%
PT	89.1%
RO	68.3%
SE	111.7%
SI	86.1%
SK	82.6%
UK	120.3%

⁵ [ISO 3166 alpha-2](#), except for Greece and the United Kingdom (EL and UK used respectively instead of GR and GB).