EDF-2021-PROTMOB-D: Soldier & logistic systems

Proposals are invited against the following topic:

EDF-2021-PROTMOB-D-SS: Development of full-size demonstrators for soldier systems;

Budget

The Union is considering a contribution of up to EUR 50 000 000 to support proposals addressing the abovementioned topics and their associated specific challenge, scope, targeted activities and functional requirements.

Several actions, addressing different topics, may be funded under this call.

Soldier Systems support force protection, increase operational effectiveness, reliability and endurance of individual soldiers and formations. They comprise the gender-neutral equipment of individual military personnel to be able to operate with a sufficient level of protection in any operational environment. Soldier Systems are a primary force multiplier. The development and integration of cutting-edge technology is key for forces.

Specific challenge

The evolving operational environment requires the development of a next generation dismounted soldier system able to enhance close combat operational capabilities such as survivability facing new threats in various operational theatres, mobility, lethality, command and control and sustainability, as well as training and simulation embedded systems to enhance readiness. It should be designed for an easy integration in a digital battlefield thanks to interoperability features with next and upgraded armoured land and airborne vehicles as well as future unmanned vehicles (UxVs) along with already deployed upgraded soldier systems.

This new generation system focuses on empowering soldier tactical decision ability that becomes more efficient within his tactical organization through a common pool of resources.

Individual capability enhancement and a comprehensive integration of soldiers in the digital battlefield should contribute to the dominance in joint operational environments for the troops in that operational environment.

Specific challenge of individual capability enhancement address the dismounted close combat domains (C4I, survivability including protections, mobility, lethality, sustainability) focusing on the reduction of the burden of the soldier while optimizing the cognitive load under operational conditions.

Scope

The proposals must address:

- The development of an individual advanced standardized and open architecture soldier core system able to integrate devices, capability suites and applications meeting this standard able to guarantee an agile process for a rapid evolution of the dismounted soldier's operational capability facing an evolving operational environment;

- Innovative technologies for new devices and capability suites development able to be implemented / integrated with the soldier core system addressing the domains of the close combat, i.e.: survivability (multi-threats protection, threat detection), sustainability (enhancement of energy source capacity and power management), mobility (localization, navigation & physical augmentation), observation (environment perception & situational awareness by day & night conditions), lethality (smart engagement), along with path-agnostic communications[1]. These innovative technologies will rely on advanced technologies such as data sciences;
- New networking capability developing mixed interactions between soldiers, armoured vehicles and UxVs in an augmented tactical unit format relying on standard interface and protocols consistent with existing or coming next tactical communication (i.e.: shared situational awareness and localization when dismounted & while dismounted from vehicles carriers, combat id, coordinated navigation, collaborative observation and protection, coordinated fire support with available weapon systems at tactical unit level);
- The above topics must show a clear vision for a harmonization process of requirements, specifications and standards able to demonstrate economical, technical and operational advantages to promote future European acquisition plans.

Targeted activities

The proposals must cover the following activities as referred in article 10.3 of the EDF Regulation, not excluding upstream or downstream activities eligible for development actions if deemed useful to reach the objectives:

- Studies, such as feasibility studies to explore the feasibility of new or improved technologies, products, processes, services and solutions;
- The design of a defence product, tangible or intangible component or technology as well as the definition of the technical specifications on which such design has been developed which may include partial tests for risk reduction in an industrial or representative environment;
- The development of a model of a defence product, tangible or intangible component or technology, which can demonstrate the element's performance in an operational environment (system prototype);
- The testing of product, tangible or intangible component or technology. **Functional requirements**

The targeted activities must address:

- Harmonization activities for requirements, specifications and standards through a large cross-fertilization process with Member States representatives in all domains (OPS, TECH, Procurement...). The harmonization approach assessment is done through:
    - Definition of Use Cases and ad-hoc concepts of operations (CONOPS);
    - Specification, design & development of an open soldier core system, which will consider the PADR GOSSRA (Generic Open Soldier System Reference Architecture) outputs executed under EDA STASS-II projects;

[1] Capability to communicate reliably to any location in the world without explicitly specifying which nodes of a communication network to use.

    - Specification, design & development of capability suites interfaced with the soldier core system;
    - Specification, design & development of network enable capability and new interactions with robotics and platforms.
- Development of demonstrators/demonstration for evaluation purpose showing operational benefits and added value of harmonization activities with:
    - A feasibility study of the soldier system concept and a selection of devices/capability suites concepts connected to the soldier core system which fulfill the given high level requirements, including a Detailed Requirements Review (DRR);
    - The detailed design of the soldier system and selected devices / capability suites sub-systems, including a System Requirement Review (SRR), a Preliminary Design Review (PDR) and Critical Design Review (CDR);
    - The development, production and evaluation in a representative environment (virtual and/or real) of technology demonstrators (soldier systems – devices / capability suites) able to be used in a representative scale demonstration making sense at the operational level and relying on a tailored existing troop carriers armored vehicles and uxv;
    - Benchmarking/testing of the demonstrators against the requirements;
- Synthesis and way to proceed for dissemination.

The soldier system and related devices/capability suites sub-systems must:

- Have a system approach including standardization and open architecture concept to guarantee a rapid evolution of the system in a cost effective way;
- Enhance operational capability in the supra mentioned dismounted close combat domains including logistic footprint and compatible with the system approach contributing to size, weight, power and cost (swap-c) criteria;
- Demonstrate secured networking enable capabilities at the tactical unit organization level involving armored troops carriers and uxvs.

To fulfill above mentioned requirements the soldier core system solution must:

- Focus on lightweight, modularity, ergonomic and highly usable man/system interfaces;
- Federate relevant upcoming technology building block (tbb) studies and existing/already performed tbbs study outcomes;
- Consider experience learned from existing deployed soldier system.

To fulfil supra mentioned requirements the soldier system and the related devices / capability suites must:

- Demonstrate substantial augmentation of dismounted close combat capability in the field of perception/situation awareness, mobility, localization/navigation and cognition thanks to multi modals interface concept and the support of Artificial Intelligence;
- Be capable to interact with small new generation robotics and drones or upgraded ones;
- Be compatible with military environmental conditions and capable of performing missions by day and night;
- Be prepared to interface new dismounted weapon systems or upgraded ones to improve individual performance and enabling networking capability;
- Support use of tactical communications;

- Be prepared to interface the land tactical cloud;
- Optimize the integration and connectivity with existing and coming next generation of troop carriers with respect to seamless communication and situational awareness in the mounted/dismounted combat phase;
- Be designed to implement embedded training to facilitate system usability on the field;
- Be design to interface training/simulation capability tools;
- Minimize logistic footprint thanks to standardization;
- Be capable to protect from CBRN threats;
- Be designed to implement cybersecurity mechanisms protecting the integrity and security of the mission information;
- Be prepared to assure the electromagnetic security (e.g. Protection against jamming).

In the frame of the development process, the project should be scheduled according to:

- A two years phase of requirements harmonization and enhancement of technologies readiness until getting a CDR gate;
- Followed by a two years development of demonstrators / demonstrations for operational evaluation purpose as well as the development of a dissemination process.

Expected impact

- Provide harmonized solutions for future capability needs of European Member States thanks to joint requirements, specifications and standards suitable for Armed Forces transformation process;
- Develop new innovative soldier technologies and capabilities in the domains of the dismounted close combat adopted by Member States Armed Forces;
- Enhance/reinforce EU industry capability to produce new highly innovative soldier systems, devices and capability suites for European soldiers;
- Establish an European business oriented consortium able to offer a European based solutions and competitive to address global market;
- Decrease dependence from non-EU technologies and products.