Border Security: autonomous systems and control systems

The proposed action should cover one of the following sub-topics:

Sub-topic: 1.Autonomous surveillance

Autonomous agents should be adaptable: in order to deal, where applicable, with extreme and diverse weather and sea condition, including in the Artic region; interconnected: interoperable and capable of exchanging information among themselves and with the system's ground segment; tele-operable from the ground.

They should support missions ranging from surveillance to detection of marine pollution incidents, and including early identification and tracking of illegal activities and illegal communication.

They should operate as single units, but also in homogeneous or heterogeneous groups i.e. mixing aerostats, aerial vehicles with fix, rotary wings (or tilt-rotor), unmanned surface vehicles (USV), unmanned under-surface vehicles (UUSV), unmanned ground vehicles (UGV) with different types of sensor and communication suites on board, customized according to operational and environmental needs and addressing cross-cueing.

Autonomous agents should exchange information at tactical level and interface with each other and with command and control systems as they exist, today, at different levels.

Sub-topic: 2.Enhanced command and control systems for the surveillance of borders in a 3D environment Autonomous surveillance

Enhanced command and control systems should integrate:

- air surveillance technologies (including radar technologies for the detection of low flying aircrafts);

- coastal and underwater surveillance technologies (including coastal radar, maritime patrol aircraft (MPA), light patrol aircrafts, unmanned aerial vehicles (UAV), Patrol Vessels, UUV, etc.);
- ground surveillance technologies (including UGV);
- satellite-based services;
- maritime information services;
- 3D cartography and bathymetry servers;
- 3D modelling of situational picture based on 3D computers graphics engines;
- augmented reality technologies;
- mobile devices and handsets such as tablets and smartphones.

The participation of SMEs is strongly encouraged.

In line with the EU's strategy for international cooperation in research and innovation[[COM(2012)497]] international cooperation is encouraged, and in particular with international research partners involved in ongoing discussions and workshops, with the European Commission. Legal entities established in countries not listed in General Annex A and international organisations will be eligible for funding only when the Commission deems participation of the entity essential for carrying out the action.

The outcome of the proposal is expected to lead to development up to Technology Readiness Level (TRL) 6 or7; please see part G of the General Annexes.

Indicative budget: The Commission considers that proposals requesting a contribution from the EU of € 8million would allow for this topic to be addressed appropriately. Nonetheless this does not preclude submission and selection of proposals requesting other amounts.

Low levels of situational awareness on the EU borders, high at sea and on unpopulated or scarcely populated land areas, are important factors of cost of border surveillance. This could improve if the different prototypes of unmanned vehicles tested today to perform automatically a very limited set of functions and routines could be transformed into autonomous, long-enduring agents able to operate in complex maritime and land environments.

Current border control systems involve a wide range of heterogeneous assets – manned and unmanned – to survey from air, surface (land and sea) and underwater. Similarly the objects of their surveillance may be vessels, land vehicles, aircrafts, and underwater vehicles used, for instance, for smuggling and trafficking. Only enhanced command and control systems using advanced 3D computer graphics technology may allow to represent accurately the position of surveillance assets – including autonomous agents – and external objects in such complex environments.

- Further development of the European Border Surveillance System (EUROSUR);

- Provision of more information that may be exchanged across sectors and borders through the Common Information Sharing Environment (CISE);
- New technologies for autonomous surveillance systems;
- Improved, cost-effective and efficient unmanned platforms for border surveillance systems, and the detection of marine pollution incidents;
- Adaptation of long-tested technologies to the specific requirements of borders control area;
- Agents and command and control systems interoperable with existing, multi-country European infrastructure.

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