

SWIFTERS Project

PREFAZIONE

Il progetto Swifters prevede sia l'acquisizione dei droni e la strumentazione hardware e software per il loro funzionamento, sia la formazione del personale per l'acquisizione della licenza di volo dei droni, al fine di costituire, a fine progetto, una task force a livello europeo, che sia in grado di intervenire nelle situazioni di crisi e di emergenza in tutta Europa, con le competenze maturate attraverso il progetto e il suo proseguimento (LeapFrog: Leading Activities for enrolment of RPAS units in the voluntary pool), a cui la Protezione Civile ha dato il suo appoggio.

I droni dunque non come acquisto passivo, ma bensì attivo per formare il personale ed essere lo strumento di supporto per le operazioni di soccorso nel territorio europeo.

Si prevede di acquisire due droni, il cui supporto informatico verrà garantito dai software che saranno rilasciati dal partner tedesco, the German Aerospace Center, mentre le esercitazioni verranno seguite dalla Protezione Civile Cipriota, che organizza da diversi anni corsi a livello europeo, per la navigazione dei droni. Il centro di ricerca dell'Università cipriota è leader a livello europeo per la strumentazione dei droni e per i piani di volo.

I droni in Sardegna potranno essere usati sia in fase di preallerta e di monitoraggio, laddove i satelliti non sono in grado di penetrare il manto nuvoloso o per motivi di orbita non si in quel punto geografico nel momento dell'emergenza, e di post emergenza per avere in tempo reale la situazione aggiornata.

PART 1 – SUMMARY OF THE ACTION

The Commission reserves the right to publish the summary for publication/dissemination purposes. Successfully executed emergency evacuations result in safe and timely movement of people away from threats or actual occurrence of a hazard. To achieve this, the evacuation process is split into a sequence of phases (including detection, decision, alarm, and people movement) in which specific operations take place. The better these phases are interlinked (through mutual visibility, timely information exchange, early situational awareness, and decision support) the better they can be planned and interweaved, which eventually leads to better response efficiency and significantly reduced evacuation times. SWIFTERS capitalizes on Unmanned Aerial Vehicle (UAV) swarms to study, design, develop, and test, cooperation strategies that support the allocation of evacuation operations to UAVs in an intelligent way with the ultimate goal of improving response efficiency and reducing evacuation times.

Within the proposed solution concept the following three operations will be integrated:

1. Monitoring of the hazard (and available evacuation routes);
2. Informing/alarming about the decision to evacuate (through audiovisual means);

3. Monitoring locations of interest (e.g., movements of people during evacuation, assembly area, and transportation routes).

At all times a joint operation picture will be maintained through updated data streams provided by the participating UAVs. It should be emphasized that actions taken in each of the evacuation phases are broadly the same, irrespective of the country or type of incident. Hence, the proposed solution is applicable to a broad range of emergencies across Europe. The main output of the proposed action will be a software package, which will be released under opensource licence, featuring emergency operation planning capabilities enabled by UAV swarms such as task allocation to individual UAVs of the swarm (e.g., monitoring emergency event progress, identifying stranded survivors, marking the evacuation path, etc.), and path planning for each UAV. In addition, detailed training material and procedures will be developed through SWIFTERS to enable the consortium partners (3 Civil Protection organizations and 2 Research Institutes) and other interested parties to master the skills on UAV operations and familiarize in using the automated features proposed within SWIFTERS through small, medium and large scale exercises.

PART 2 –CONTEXT OF THE ACTION AND NEEDS ANALYSIS

This proposal version was submitted by Christos PANAYIOTOU on 11/05/2017 16:58:38 Brussels Local Time. Issued by the Participant Portal Submission Service. 3 EU DG ECHO actively promotes the use of UAV in emergency management through the development of modules using UAVs by the national Civil Protection (CP) authorities, and properly framing the use of UAV units and modules by the Union Civil Protection Mechanism (UCPM)¹. The Vasilikos incident in Cyprus in 2011 has been the primary example that motivated the formation of RPAS units within the EU.

Moreover, the requirements for selected RPAS operations for civil protection have been fed to DG MOVE and EASA² for the development of templates through their mechanisms of developing European safety rules for civil UAVs. SWIFTERS leverages UAV swarms to study, design, develop, and test, UAV cooperation strategies to assist civil protection operations, such as emergency evacuation. This action has come together after seeing the great potentials of UAVs in emergency management during the DG ECHO PREDICATE project.

In particular, PREDICATE demonstrated the use of standalone UAVs for watch-keeping and patrolling regions of interest in order to enhance the disaster prevention capabilities of civil protection and other relevant authorities.

Building upon these previous action results, SWIFTERS is a continuation of the work conducted by the KIOS Research Center at the University of Cyprus (UCY-KIOS), the Center for Security Studies of the Ministry of Interior in the Hellenic Republic (KEMEA), and the Cyprus Civil Defence (CCD), i.e., all members of the PREDICATE project consortium. The Direzione Generale della Protezione Civile Regione Sardegna Italy (RAS) is an additional Civil Protection authority that participates in the proposed action and has expressed great interest in enhancing the capabilities of their personnel with the envisioned UAV solutions.

SWIFTERS aims to enhance the existing emergency operation capabilities by developing algorithms and software to assist commanders deploy UAV swarms in emergency evacuation, train personnel in using swarms of UAVs (each with a specific role in the mission), and transfer new knowledge to the training conducted within the Assessment Mission Course of the Union Civil Protection Mechanism Training Program. Specifically, the key needs that will be addressed by SWIFTERS include:

1. Improve response efficiency: With the coordinated use of UAV swarms, Civil Protection authorities can respond promptly in case of emergency events and gain situational awareness in short time to make informed decisions and proceed quickly with a well-planned operation/mission. For instance, different UAVs of the swarm can cooperatively detect and approach distant groups of stranded survivors in the event of fire or flood and identify the number of survivors in each group and their health conditions.
2. Reduce evacuation time: UAVs can collaborate during an emergency operation and undertake different roles for reducing the evacuation time. For example, in case of a fire one UAV can monitor the event progress, while another UAV can guide civilians away from danger by indicating a safe evacuation path; if the event conditions change (e.g., the wind direction changes) then the UAVs would exchange information to suggest an alternative evacuation path.