

## **Annex II to the Invitation to Tender Frontex/OP/612/2020/JL**

# **Terms of Reference**

**Maritime Surveillance  
Aerostat 2 technology pilot**

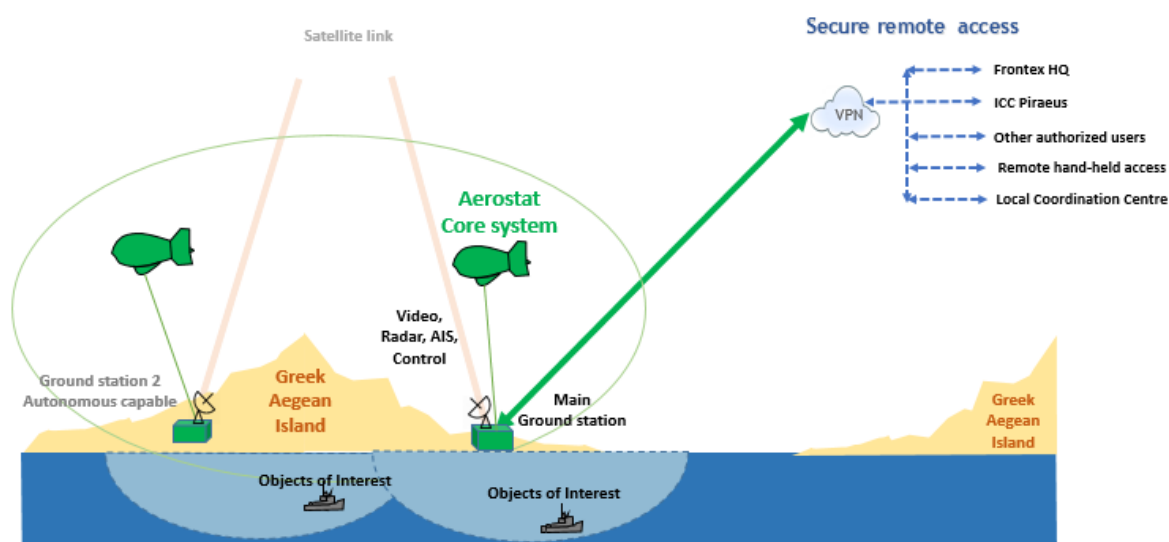
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## 1. Background and context

The European Border and Coast Guard Agency's (Frontex') new Regulation<sup>1</sup>, establishes that the Agency may acquire or lease technical equipment for external border control to be deployed during joint operations, pilot projects, rapid interventions, joint return operations or technical assistance projects, and in accordance with the financial rules applicable to the Agency.

The global objective of this tender is to lease two surveillance aerostats to carry out a second pilot project, supported by a host Member State: Greece, aiming to assess the capacity and cost efficiency of aerostats performing maritime surveillance in an operational environment. The scope of the tender, aligned with the cited Regulation, is then to establish a service contract to deploy, operate and assess for a period of minimum of four months and maximum of six months two surveillance aerostats, including in the contract the provision of the equipment and experts to conduct the trial. For the purpose of this procurement a surveillance aerostat shall be understood as a lighter than air unpowered craft, statically fixed by a cable, capable to lift a downward-looking surveillance payload (i.e. sensors in the payload shall include: one EO/IR gimbal, maritime surveillance radar, AIS receiver and communication device) and of sharing the data captured by its sensors with users on the ground via a broadband connection.



The scenario depicted in the figure above shows the trial set-up intended by Frontex to be put in place under this contract. The image presents the aerostat systems deployed in the coast of a host Member State. The sensors in the aerostats capture and pass maritime surveillance data to the Ground control Stations (GCS). From the GCS the aerostats' payload is controlled and the GCS transfer the information acquired by the aerostats to the International Coordination Centre in Athens (Piraeus) and/or to other authorized users via a broadband link.

### 1.1. Introduction

Surveillance of EU external borders aims to create situational awareness by detecting and identifying irregular migration and other border related criminal activities. EU Member States deploy in the EU external borders sensors, communication systems, and command and control systems to create a cost-efficient situational picture facilitating their timely reaction capability.

<sup>1</sup> Regulation (EU) 2019/1896 of the European Parliament and of the Council of 13 November 2019 on the Border and Coast Guard. External link: [Frontex Regulation](#)

One of the key objectives of Frontex is to keep Member States informed about new technological developments in the field of border control. In this regard, among other activities, Frontex, with the support of Member States, organizes live demonstrations of surveillance technologies under the format of 'pilot projects'.

## 1.2. The Problem

Two important concerns of border surveillance practitioners are affordability and persistence. Aerostats may therefore play an important role by providing cost-effective and persistent maritime border surveillance platforms.

In 2019, Frontex together with the Hellenic Coastguard conducted a first pilot on maritime surveillance by aerostat. The first pilot took place in Samos, Greece.

The Pilot was evaluated as inconclusive mainly due to the placement of the aerostat platform too far from the coastline, in a hilly area, payload limitations, as well as connectivity issues. To better evaluate how aerostats work in practice in a maritime surveillance role, Frontex in cooperation with the Hellenic Coast Guard is organizing this second trial, during which an up to date solution on aerostats will be deployed and assessed. This solution will be deployed in relevant coastal locations for an extended period. The second pilot will have improved system architecture including requirements for sensors' integration and data sharing.

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## 2. Description of the tender

The procurement defined in this document consists in the delivery by a Contractor of two maritime surveillance aerostat systems, payload control, corresponding ground mission control and sensors data processing for each aerostat, data transmission and the necessary expertise to deploy and manage it. The systems will be used for the execution of a pilot project to test and evaluate the performance a replicable or extendable maritime surveillance model, rendering data integration of at two systems both deployed in different locations, and performing at the same time maritime surveillance by aerostats. The deployment, test and evaluation will be carried out in two fixed points on the coast of one EU Member State, Greece, over a specified timeline defined below.

### 2.1. Participation in the tender procedure

This procurement procedure is open to any natural or legal person wishing to bid for the assignment and to international organisations.

### 2.2. General Description

During the pilot project, the selected Contractor will deploy its aerostats and will transfer, 24/7, the sensor data captured by the aerostats and received by the ground control stations, with the ability to switch from the control of each payload independently from each ground control station to control both payloads from one ground control station at the discretion of the operator, seamlessly. Payload sensor data from both maritime surveillance aerostats shall be compiled and presented in the GCS in a comprehensive C2 system representing the maritime area under surveillance, including full integration of sensor footprints, AIS tracks, radar tracks, camera video and metadata.

Systems and sensors operators provided by the Contractor will manage the payload and, supported by a Liaison Officer from the Host Country Authority/Frontex, will be able to further distribute the compiled picture.

#### Platforms

**Type:** Tethered balloons

**Length:** minimum 19 m to maximum 28 m

**Flight endurance/persistence:** minimum 7 days

**Max Payload Weight:** at least 85 kg

**Indicative flight height:** minimum - 300 feet; maximum - 1600 feet or higher

**Payloads:** LONG-RANGE ELECTRO-OPTICAL SYSTEMS, Maritime Surveillance Radars, AIS receivers, communications, GSM phone location equipment (optional)

**LONG-RANGE ELECTRO-OPTICAL SYSTEM allowing integration with other sensors and applications (radar, AIS, mission management)**

Fully stabilized (minimum 4-axis stabilization) gimbal with 360° pan range at a slew rate of 60°/s and line of sight low slew rate adaptable to the current field of view.

EO/IR multiband system including Daylight Camera, Thermal Imaging Camera (Infra-Red), Eye-Safe Laser Range Finder, SWIR camera, optionally: NIR camera

**Thermal (Infra-Red) Imaging MWIR Camera**

Resolution: not less than 1280 x 720

Type: Continuous optical zoom

**SWIR camera**

Resolution: at least 640 x 480

**Embedded processing:** Automatic video tracker

**EOS characteristic:** Single LRU equipment

**Indicative detection distances**

Small Boat Detection Range, Night Time: ~8 nm

Person Detection Range, Night Time: ~5 nm

**Colour day camera**

Resolution: not less than 1920 x 1080 Full HD

Type: continuous zoom

**NIR camera - optional**

**Exportability:** Camera components not subject to ITAR

**Maritime Surveillance Radar allowing integration with other sensors and applications (EO/IR, AIS, mission management)**

Equipped with radar data processor & tracker capable to automatically detect and track targets at **Indicative detection distances** (at sea state 3): Small Boat (Radar Cross Section - RCS = 1m<sup>2</sup>) ~ 10 nm; Patrol Vessel (RCS = 20m<sup>2</sup>) ~ 21 nm

Frequency: X band;

Automatic target tracking (Track while scan): minimum 100 tracks;

Antenna gain > 30 dB; panoramic view: 360°; peak power ≥ 12 kW

Pulse compression technology

Radar Resolution ≤ 10 m on the full instrumented range

The radar must be equipped with a pitch/roll compensation mechanism able to compensate the movement up to 30° maximum amplitude of pitch/roll combined angle with up to 20°/s maximum angular speed.

**Information available in the Ground Control Stations**

Compiled Operational Picture, including: Mission Map; Platform GPS position; Sensors coverage areas; Sensors Footprint; Georeferenced Objects and Incidents of Interest with associated metadata text description; Live Streaming Video of FMV quality; Radar and AIS tracks.

At least one GCS shall have the ability to function autonomously, receive and control both aerostats' payload sensor data or act only as a data relay in relation to the other GCS.

Each GCS shall be fitted with redundant uninterruptible power supplies for the sensors processing and management systems and communication equipment.

## **C2 System**

**Resolution:** two combined displays with minimum screen resolution of 1920 x 1080 Full HD

**Sensors integration:** payload sensors data integrated and fused in one operational picture with the ability to identify from which payload the data is displayed

**Mission Map:** map representation of C2 area, simultaneous display of sea and land maps

**Radar video:** display of radar video in true motion, including fully retroactive true trails for at least 15 minutes.

**Camera video:** full integration of Long-Range Electro-Optical System, including camera operation specifically adapted to camera features

**External data:** capability to integrate external data/services, such as vessel blacklists, etc.

**Reports:** capability to automatically generate mission reports

## **Additional capacities in the Ground Control Stations**

Each GCS might be situated geographically in a beyond line of sight scenario from each other and the necessary precautions to ensure the continuity of communications between them is mandatory.

Communications; Video Server with video recording capacity for the duration of the trial; Encryption devices; Remote Information Portal to share information with users outside the GCS.

## **Remote Information portal**

The Portal should grant web based access to a number of authorized IP addresses via HTTPS (designated Coordination Centre and other authorized remote users from the Host Country and Frontex) with the possibility to administer locally the access to live and recorded video.

The Portal interface should give structured access, for the duration of the service, at least to:

- Ongoing mission (if any): live Compiled Operational Picture, live camera feed, radar feed (at least to be able to switch from one to the other whenever there is a need from remote), chat with mission coordinator/sensor operator;
- Schedule of future Missions/shifts;
- Information on finished Missions: mission reports, registered videos.

The bidder is required to describe in its bid the technical setup, the topology for the data flow and the details of the data processing in line with the requirements stipulated above.

## **GSM phone location equipment (optional)**

The bidder is required to describe (if offered) GSM **3G, 4G, LTE** phone location equipment (**passive**) to be tested as standalone system or integrated.

## **2.3. Budget**

The maximum budget earmarked for the contract is net EUR 3,010,000. Payment schedule:

- a) Set-up phase: 40% advance payment
- b) Trial phase: 50% payable after completion and acceptance
- c) Assessment phase: 10% payable after completion and acceptance

## 2.4. Assignment

The contract implementation consists of one single lot to be executed following the phases described below. The service consists of the provision of two surveillance aerostats with mandatory provision of IR/EO multiband cameras, maritime surveillance radars, AIS receivers, communications and ground control stations.

### 2.4.1. Kick - Off Meeting.

At the kick-off meeting, the Contractor, Frontex and the host Member State will jointly decide on specific deployment sites and deployment dates, details related to the local logistics support to the deployments. The kick-off meeting will be followed by site surveys.

### 2.4.2. Set-up Phase

This phase consists of the preparation by the Contractor, together with Frontex and the host Member State, of the necessary tasks to implement the deployment of the aerostats, mooring stations, ground control stations, connectivity to ICC and training of web portal users. The Contractor is responsible for the site ground work preparations required for the aerostat deployment in both locations.

### 2.4.3. Trial Phase

This phase tasks consist of the actual provision of surveillance data from the systems deployed, operating for a period of minimum 4 and maximum of 6 months, 24/7(except the necessary maintenance windows). Contractor should assure the proper operability of their systems and managing it.

### 2.4.4. Assessment Phase

This phase tasks consist of the joint evaluation of the results obtained by host Member State, Frontex and the Contractor. This evaluation shall include the appraisal of the sensors used, data processing and data sharing systems reliability and cost efficiency of the results obtained.

### 2.4.5. Activity Timeline estimation

The pilot project initiation and setup shall be started in the Q1-2021 followed by operational trials and assessment.

- Kick-off: second week of January 2021
- Set-up Phase: April 2021
- Trial Phase: May - October 2021
- Assessment Phase: June 2021 - November 2021

## 2.5. Deliverables

### 2.5.1. Set-up Phase

- a. Project plan including a time schedule and work breakdown structure
- b. Equipment deployment, installation and testing plan
- c. Information connectivity and data transfer testing plan

### 2.5.2. Trial Phase

- a. Surveillance data and information capture by the aerostats' payload
- b. Technical support provided by Contractor's personnel to maintain the systems' operability during the trial phase.
- c. Sensors operators provided by contractor and supervised by the host Member State staff.

### 2.5.3. Assessment Phase

- a. Contribution to the joint evaluation report

## 2.6. Venue

Services contracted under this tender procedure should be performed by the Contractor in two fixed sites on the coast of the Eastern Aegean Sea, indicated by the host Member State, Greece, to the awarded Contractor.

The meetings: the kick-off and the final project meeting will be held in the premises of Frontex in Warsaw, Poland and/or in the Hellenic Coast Guard HQ in Athens (Piraeus).

## 2.7. Working environment and conditions

The deployment of the aerostat systems will take place at sites which do not at present have infrastructure to accommodate Aerostats, mooring stations, ground stations, etc. The Contractor is responsible for the sites' preparation works required for the Aerostat systems' operation and accommodation on the ground.

The Contractor is responsible for the logistics including but not limited to: addressing customs and potential import issues, obtaining the necessary clearances and Air Traffic Control management, as well as of procuring the necessary maps of the Operational Area.

The Contractor provides internet connection, the bandwidths suitable to transfer all data without any latency delay and delivers a fully managed service including all necessary circuit, hardware and software rental and maintenance for the duration of the contract.

The Contractor has to provide a proper volume of helium assuring the system tests, operability and maintenance in accordance with the estimated timeline.

The Contractor is responsible for the safe dismantling and removal/disposal of the hardware up to one month after the completion of the Pilot at the latest.

## 2.8. Experts description

The Contractor should provide an adequate team of experts for the requested services, including ground operation. Each expert from the team of experts proposed to be assigned to this contract by the Contractor should have demonstrable 2 years of expertise (via CVs, publications, reports, etc.) in one or more of the following areas:

- Surveillance technologies
- Communications
- Sensors operators (e.g. radar, camera)
- IT technologies
- Aerostat's technology

The team assigned by the Contractor must together demonstrate a complementary and complete set of skills necessary for the fulfilment of the project's requirements as described in these Terms of Reference. The experts' curricula vitae must contain information regarding his/her relevant experience in these fields and his/her role in any project or activity described must be clearly stated. The experts shall also be in a position to fulfil the tasks described in these Terms of Reference without incurring a conflict of interest with current or past employers, disclosing classified information, compromising or creating harm to third parties.

The experts taking part in the trial will be required to sign a Declaration of Confidentiality.

The proposed personnel involved in the management of data/ information will have to be in possession of security clearance, valid for the duration of the trial, at the minimum level of CONFIDENTIEL UE/EU CONFIDENTIAL that shall be read as following:

- A personnel security clearance certificate for the level of CONFIDENTIEL UE/EU CONFIDENTIAL or higher, issued by the respective NSA/DSA of the MS concerned and provided by the management or the security officer (if there is one) of the company itself;



or

- A Request for Visit (RFV) or a clearance certificate issued by the NSA/DSA and directly communicated to Frontex through official channels.

Other personnel security clearance certificates equivalent with the required EU MS ones can be accepted, but only after their prior acceptance by the Frontex Security Officer.

## 2.9. Reporting and Meetings

The working language of this assignment is English and all the deliverables (see under Point 2.5) produced by the Contractor shall be produced in English. All documents shall be delivered in editable electronic form in MS Word (please note that all the accompanying drawings, tables, graphics and supporting data shall be provided in an editable source format agreed with Frontex).

The Contractor shall report to the assigned Frontex Point of Contact on a weekly basis, and ultimately to the Head of the Research and Innovation Unit, on the progress of the work.

At least the following foreseen meetings are to be observed in the offer:

- Kick Off meeting to finalize and agree on the detailed necessary tasks to implement the deployment (to be held at Frontex premises in Warsaw and/or in the Hellenic Coast Guard HQ in Athens (Piraeus))
- Daily briefings with the person designated by the Host Member State as Point of Contact responsible for the activity
- Final project meeting (to be held at Frontex premises in Warsaw or in the Hellenic Coast Guard HQ in Athens (Piraeus))

Cost of participation in all foreseen meetings will not be reimbursed and it should be incorporated in the fixed net price of the system deployment.