European Maritime Safety Agency

Appendix 4 – Technical Tender Template

Enclosed to Invitation to tender for procurement procedure No. EMSA/OP/10/2018 concerning *Contracts for Remotely Piloted Aircraft System (RPAS) services for Emissions Monitoring and Maritime Surveillance*

In case of Individual submission

Name of the company

In case of Joint offer

Name of grouping *(if applicable)*

Names of the partners

-
-
-

Contact person

Name:

Address:

E-mail:

Fax:

Date & Signature

Done at ,on 2018

Signature of the authorised representative

PART G

Technical Award Criteria

(Documentation linked to the Tender Specifications point 15.1)

The submission of the bid must be done via the e-Submission application as explained in section 11 of the Tender Specifications and in *Appendix 7 – E-Submission Guidelines.*

This template refers to point g) of section 11 of the Tender Specifications and gives guidance on the information to be provided pertaining to the Quality Award Criteria as defined in section 15.1 of the Tender Specifications.

The bidder is not required to use this document and available styles. He may choose to use a company template as long as the structure and guidance is followed.

This template is supposed to provide guidance on the structure and presentation of the tenders. It does not set out any additional minimum requirements.

The provided reference documentation will be treated strictly confidential.

TABLE OF CONTENT of PART G - Technical Award Criteria

General Description

(Include your description here)

1.1 General RPAS description

Provide the general description of the Remotely Piloted Aircraft System including the description of the different sub-systems: aerial vehicle (including its sub-systems), control station, ground data terminals, system for launch and recovery (if necessary) and for collecting, formatting and cataloguing data from the mission.

Describe the architecture of the flight control system indicating the redundancies of sensors, actuators and flight computers (if any).

Provide illustration/tree of Product Breakdown Structure and images or illustrations of the different subsystems.

1.2 Operational solutions provided

Provide the operational procedures to carry out each of the concepts of operation as described in section 2.2 for Emissions Monitoring (Lot 1) and section 2.3 Maritime Surveillance of Appendix 1 Technical Specifications distinguishing between day and night conditions when applicable.

The description of each operational procedure shall include at least the payloads to be employed and their configuration/operational mode. This might include a description of the flight plan along with the sequence of actions and commands.

The bidder should describe how the proposed team is suitable to deliver the requested services as per section 4.1.10 of Appendix 1 Technical Specifications.

Note: Please attach available evidence supporting the points above

Q(1) Fulfilment of Technical Requirements

Q(1).1 Compliance with Flight Availability Requirements

(Refer to section 4.2.2, 3.4 and 3.5 of Appendix 1 Technical Specifications)

(Insert your description here)

(In addition, please fill in the following table)

Number of RPAS offered *Provide the number of RPAS offered for concurrent deployments (minimum two).*	
Minimum time for module 1 “mobilisation alert and preparation” *The bidder has to state the minimum time he needs for “mobilisation alert and preparation” before the transport to the site (module 2) can be started (not taking into account the time needed by the CAAs to issue the permit to fly). Refer to section 3.1 of Appendix 1 Technical Specifications.*	

Flight time availability *The Bidder has to state its maximum consecutive flight hours capabilities per 24 hours' time interval.* *This has to be done for the 5/7 and for the 7/7 (only for Lot 2) operational modes. Refer to section 3.4 of Appendix 1 Technical Specifications.*	
Unscheduled tasking time (only for Lot 2) *Provide the notice required to be able to conduct an unscheduled mission. Refer to section 3.5.1.11 of Appendix 1 Technical Specifications.*	

Please describe further your proposed solution addressing Flight Availability Requirements and detailing the statements above.

1.1 RPAS available during a deployment

If the Bidder shall list the available RPAS for service also including those used for e.g. backup, to reduce maintenance downtime and to extend daily continuous operations.

1.2 Number of RPAS offered for concurrent deployments

Justify your statement above describing the number of RPAS including aerial vehicles, equipment, spare parts and crew that is in the offer and that therefore could be mobilised for concurrent deployments.

1.3 Frequency of flights and weekly capability of flight hours

Specify your maximum daily and weekly capability/frequency of flights. This could be done e.g. by providing weekly flight plan showing your maximum flight time availability.

Also specify your maximum flight readiness time.

Refer to section 3.4 and 3.5 of Appendix 1 Technical Specifications.

1.4 Flight scheduling and tasking procedure

If the Bidder already has a procedure for scheduled tasking in place, this should be described in the bid.

Documentation to be provided

Documents	Reference in bid	Delivered in bid
Procedure for scheduled tasking		☐ *(if available)*

Q(1).2 Compliance with operational requirements

(Refer to section 4.2.2 and 4.3.2 of Appendix 1 Technical Specifications)

(Include your description here)

(In addition, please fill in the following table)

Speed	

Endurance	
Maximum range	

Please describe further your proposed solution addressing Flight Availability Requirements and detailing the statements above.

2.1 Performance and Operational limits of the Aerial Vehicle

This shall include but is not limited to:

- *for general performance conditions:*
  - *Maximum Take-Off Mass (MTOM), operating empty weight (without payload), payload mass of the configuration proposed, the maximum payload mass capability,*
  - *the maximum endurance for the payload configuration proposed. Additionally the bidder shall provide the relation between the endurance and take-off-mass,*
  - *the cruise speed, the maximum speed, the minimum speed for the configuration proposed,*
  - *ceiling altitude in relation to the take-off-mass,*
  - *the dimensions of the RPA, and*
  - *the variables above are dependent on each other; therefore the endurance, maximum speed and the ceiling altitude should be given as a function of the take-off-mass.*
- *for operational conditions and limitations:*
  - *temperature range, humidity and visibility for take-off, flight operation and landing,*
  - *precipitation under which the RPA can take-off flight operation and landing, including the impact on the payload operation,*
  - *wind tolerance separately for take-off, flight operation and landing (including ability for the payload to provide usable data),*
  - *ability to operate in icing conditions,*
  - *and type and dimensions of the landing area for take-off and landing.*

Note: attach all the evidence supporting the stated above (i.e. range endurance, wind tolerance, etc.)

2.2 Emissions Monitoring Measurements (only for Lot 1)

Explain in detail the methodology used to calculate the sulphur content from the gas samples taken from the plume. Describe the procedure used to assess the quality of the calculation.

Describe the strategy to take the samples:

1. Describe the strategy used to detect the plume. Indicate the sensors, if any, used to detect the plume and the distance from which it can be detected.
2. Describe the approach used by the pilot to steer the RPAS into the plume. Indicate the flight mode and the flight parameters (e.g. speed and altitude) used to steer the aircraft. Indicate the flight instruments used by the pilot to perform the approach to the plume (e.g. front camera, altimeter, course indicator, etc.)

3. Describe the procedure/sensors used to confirm that the RPAS is in the plume (e.g. through the readings of any quick response time sensor)
4. Describe the procedure to take the samples indicating the time needed to remain in the plume. Describe the methodology used to confirm that the samples are valid.

2.3 Vessel Based operations (only for Lot 2)

Describe the previous experience in ship based operations, indicating the ships used and the accumulated flight hours. Indicate the time required for setting up a ship based operation.

Indicate the dimensions of the deck required for take-off and landing and the operational limits describing at least the maximum sea-state and the oscillation of the ship.

Describe the strategy used for take-off and landing and in case the strategy requires the installation of any additional equipment in the ship, please describe it.

Describe all the logistic aspects that might have an impact on the deployment from a ship, including the number of staff needed on board, power supply needs (in case the RPAS uses its own power generator, please describe it including the type of fuel and the amount needed to be stored on board), the storage area (square meters required in the ship or the size of any storage container that is intended to be installed in the deck), area needed to place the ground control station, type and litres of fuel per mission (maximum) and the method to dock the RPAS in the deck.

Describe the type of all the ground antennas (e.g. omnidirectional, tracking antenna, etc.), and their installation constraints (e.g size of the ground plane, distance between antennas, maximum distance to the ground control station). Indicate the safety distance limits from all the ground antennas.

2.4 Flight modes

Describe the flight modes as requested in section 4.2.2.5 and 4.3.2.1 of Appendix 1 Technical Specifications, including the automatic take-off and landing capability, the specific flight modes or flight patterns for each type of operation (this could be supported by providing the real time flight commands i.e. go to coordinates, hold altitude, loiter, and return home, …).

2.5 Capabilities in supporting the issuance of permits to fly

Include the list of countries where the bidder and the RPAS offered has conducted operations previously. Attach the permits to fly obtained for those operations.

Include all the relevant documents used to obtain previous permits to fly, as a minimum the operational/flight manual and the risk assessment and mitigation measures shall be delivered.

Documentation to be provided

Documents	Reference in bid	Delivered in bid
Previous permits to fly		☐
Operational/Flight manual		☐
Risk assessment and mitigation measures		☐

Q(1).3 Compliance with platform requirements

(Refer to section 4.2.2, 4.3.2, 4.1.5 and 4.1.6 of Appendix 1 Technical Specifications)

(Insert your description here)

3.1 Maturity of the system

The contracting authority wants to build upon RPAS solutions that are already flying the required payload and subsystems. Exception is made for the integration of the emissions monitoring sensor in Lot 1 where more time is given although liquidated damages apply for delays beyond 3 months following the signature of the FWC as explained in section 7 of the tender specifications. In this regard, the bidder shall clearly specify in the bid the configuration that is already in place and demonstrate their maturity by providing the excerpts of the flight logs including incidents.

3.2 State of Certification

Describe the status of the certification and/or the qualification of the RPAS and of the different subsystems (i.e. the engine) along with the standards employed.

Note: attach all the documental evidence supporting the information above

3.3 ITAR components

Provide the list, if any, of the components (hardware and software) that are subject to the International Traffic on Arms Regulation (ITAR) or any other export restriction.

Note: attach all the documental evidence supporting the information above.

3.4 Safe Use of the Airspace

Describe any technology or equipment installed to increase the safety and efficiency use of the airspace (i.e. aviation transponder, ADS-B, specific cameras, etc.)

Describe any concept or strategy implanted to reduce the risk for third parties, i.e. geo-fencing.

3.5 Visual and acoustic signature (only for Lot 2)

Refer to section 4.3.2.2 of Appendix 1 Technical Specifications

3.6 RPA Airworthiness Approval

The Bidder shall provide in its bid the experience of his staff in previous approval processes.

Refer to section 4.1.5 of Appendix 1 Technical Specifications.

The Bidder shall identify the previous approval status and approval types for the RPAS and its components. Relevant certified management systems should be used according to aviation standards and shall described in the bid.

The Bidder shall summarise his proposed approach to manage the operational risks associated to the RPAS services and demonstrate to the approval authorities that risks are appropriately mitigated.

3.7 Air Traffic Management

The Contractor shall provide in its bid the experience of his staff with ATM procedures for integration of its RPAS into the airspace and previous flight approvals already received for the proposed RPAS.

The Bidder is requested to describe already available:

- *operational procedures for the proposed RPAS including interaction with ATC and hand-over procedure between RPA pilots;*
- *flight check lists;*
- *maintenance plans;*

- *RPA pilots' qualification/training plan including ATM/airspace knowledge;*
- *Mitigation strategy for the following generic hazardous scenarios: loss of command/control link, loss of ground control station, loss of communications with ATC, loss of control of RPA, loss of engine and technical failure of the RPA;*
- *any proposed "detect and avoid" technology;*
- *contingency procedures.*

Refer to section 4.1.6 of Appendix 1 Technical Specifications

3.1 Insurances

The bidder shall describe in the bid the insurances and their value offers for third party liability, for his staff and for his equipment.

3.2 Flexibility to store and drop-off items (only for Lot 2)

The bidder shall describe the configuration and capabilities (if any) to store, carry and drop-off items (e.g. external pods under wings)

Documentation to be provided

Documents	Reference in bid	Delivered in bid
Logbook of the RPAS offered		☐
Proposal for the Initial configuration test		☐
(High level) maintenance and spare part management plan		☐
Present or previous third part liability, staff and equipment insurance		☐

Q(1).4 Compliance with Payload requirements

(Refer to section 4.2.3, 4.2.4, 4.3.3, 4.3.4 and 4.1.1.2 of Appendix 1 Technical Specifications)

(Insert your description here)

4.1 Provide the list of the payloads installed and in use into the RPA

Provide for each payload its technical specifications including their performance characteristics, their modes of operation (including automatic detection and tracking modes for specific targets of interest for lot 2) and their environmental conditions for operations and storage.

4.2 Detection Capability (DRI)

The detection, recognition and identification (DRI) capabilities of all relevant sensors shall be provided along with the description of the methodology/criteria used for their determination and the assumptions made.

Refer to section 4.2.3, 4.2.4, 4.3.3 and 4.3.4 of Appendix 1 Technical Specifications.

4.3 Electro optical and IR equipment suitability for the deployments (technical details required)

For the EO and IR cameras the technical specification and operational modes shall be given. The bidder shall provide a brief description of how the payload sensors will be employed and their

configurational/operational mode to fulfil the requested emissions monitoring and/or maritime surveillance activities.

Refer to section 4.2.4 and 4.3.4 of Appendix 1 Technical Specifications.

4.4 Radar equipment suitability for the deployments (technical details required – only for Lot 2)

For the radar (maritime mode and synthetic aperture mode) the technical specification and detailed operational modes shall be given, and the operational performances in particular applicable for maritime surveillance shall be provided, Additional modes, e.g. GMTI, SAR (search and rescue) shall be described which supplement the capabilities for maritime surveillance. The bidder shall provide a brief description of how the payload sensors will be employed and their configurational/operational mode to fulfil the requested maritime surveillance activities

Refer to section 4.3.4 of Appendix 1 Technical Specifications.

4.5 Emissions monitoring sensor

Describe the type of each of the gas sensors integrated in the emissions measurement unit. Indicate for each gas sensor its sampling technology, its response time, its range, its resolution, its uncertainty, and the time between calibrations. Describe the calibration procedure.

Describe any additional sensors integrated in the emissions measurement unit (e.g. temperature sensors, humidity sensors, etc.).

Describe how calculations will be made to finally get a result on the percentage of sulphur in the ship's fuel. This should also include the methodology on the quality measurement so that it is clear on the confidence of the accuracy of a measurement as well as the accuracy of the measurement (relative Standard deviation)

4.6 Further sensors (technical details; i.e. AIS, distress, …)

For the rest of payloads, i.e. AIS, distress sensors, the bidder shall provide the technical specification and operational mode. The bidder shall provide a brief description of how these payload sensors will be employed and their configurational/operational mode to fulfil the requested maritime surveillance activities

Refer to section 4.2.4 and 4.3.4 of Appendix 1 Technical Specifications.

4.7 State of certification of the sensors

Refer to section 4.1.5, 4.2.4 and 4.3.4 of Appendix 1 Technical Specifications.

The Bidder shall identify the previous approval status and approval types for the payload and its components and shall provide relevant certificates.

4.8 Payloads and performance improvement

Provide a description with a clear timeline of any improvements beyond the minimum requirements that will be implemented during the lifetime of the contract (i.e. increase the endurance). Include an implementation plan for each of them.

Refer to section 4.2.4 and 4.3.4 of Appendix 1 Technical Specifications.

Q(1).5 Compliance with Communication requirements

(Refer to section 4.1.3 and 4.1.9 of Appendix 1 Technical Specifications)

(Insert your description here)

5.1 Communication between the aerial vehicle and the ground segment

The bidder is requested to provide the description of all the communication links between the Aerial vehicle and the Local Ground Control Station (LGCS), including the primary links along with all the secondary links (redundancies) for RLOS. This description shall specify at least the technology, the frequency/band, the power, the coverage and range, the guaranteed bandwidth, the power, the latency, the protocols, encryption and security measures of each communication channel.

In case the communication channels can be adjusted to operate in a range of frequencies, these frequencies will be listed.

The Bidder shall describe which communication contracts are already in place and/or foreseen.

The bidder shall describe the architecture of the ground segment, which encompasses the local ground control station, the ground antennas and any other central control units, and the communication channels in place between these different units. Indicate the maximum distance between the ground antennas and the local ground control station and the type of connection between them.

5.2 From the ground segment to the End User and to the RPAS-DC

The bidder is invited to provide de description of the primary and secondary communication links intended to stream the data collected. The secondary link is only applicable for shore based operations.

Specify the minimum required bandwidth and the bandwidth ensured by both links between the ground segment to the End User and to the RPAS-DC.

5.1 ATC communication

Provide the description of the communication link (or links) between the RPAS operator and the ATC unit.

Provide the description and technical information of any addition communication link, for instance a specific link for an independent flight termination system

5.2 Data security concept

The bidder is invited to define its mechanisms, procedures and systems to ensure resilient against cyber-attacks against the RPAS operation. The concept data security shall be described in the bid.

5.3 Data Storage

Data shall be stored and managed under European law in order to ensure data privacy as required in the European Union. Therefore EMSA would like to receive the following confirmations in the bid, either:

- *That all the data derived from the RPAS are processed and stored in the premise of the contractor, which shall be located in the EU under a legal regime of an EU Member State.*
- *That the contractor process and/or store any data in the cloud. Is the cloud hosted in Europe and does the cloud provider operates under European law (it is not sufficient that the cloud is hosted in Europe, but the hosting company is under the legal regime of a non EU country).*

Q(1).6 Quality and Compliance of the Solution proposed for Data provision and analysis

(Refer to section 4.1.6 and section 4.1.7 of Appendix 1 Technical Specifications)

(Insert your description here)

6.1 Analysis capacity - Data exploitation in the Local Ground Control Station (LGCS)

Describe your experience and knowledge in analysing the data in order to alert the user on any object of interest as requested by the user, as per section 4.1.6 of Appendix 1 Technical Specifications.

Describe the layout of the LGCS and the software and features available to the RPAS and payload operators to exploit the data collected during the ongoing mission and in post mission (e.g. automatic suspect detection, classification, extraction of dimensions, etc.).

Specify the image enhancing capabilities and tools, if any, to apply corrective measures/filters to the images collected.

6.2 Data Provision - flight monitoring and data visualisation

The Bidder is requested to describe in the bid the data visualisation technology he provides in detail and to provide access to a mock-up, video or test account during the evaluation phase demonstrating the visualisation and data exploitation capabilities of the offered systems. EMSA believes that the bidders already have visualisation and data exploitation capabilities and therefore the mock-up solution or test account refers to these existing systems. This is in order for EMSA to be able to analyse and compare the offered data visualisation technology to other bidder solutions during the evaluation phase.

The bidder should demonstrate that the proposed solution is stable and robust and has already been used successfully in previous operations

6.3 Quality of proposal for module 5

Include a basic project plan for the implementation of module 5 respecting the time requirements.

Specify standards already in use by your company

Q(2) Quality Assurance of products and services

Q(2).1 Proposed Project Management Plan for the EMSA service

(Include your description here)

1.1 Recognised standards for project management

The bidder shall describe in the bid the project management plan as defined in section 9.2 of Appendix 1 Technical Specifications.

1.2 Staff composition

The bidder shall provide the proposed team composition and organisation: including the involvement and interaction of each role within the different modules of the FWC including within a deployment as defined in section 4.1.10 and 9.2.1.2 of Appendix 1 Technical Specifications.

1.3 Staff training plans

The bidder shall provide the proposed staff training plan shall also be described including pilots, operators and other experts as defined in section 9.2.1.2 of Appendix 1 Technical Specifications.

Q(2).2 Proposed Operational Plan

(Include your description here)

The bidder shall describe in the bid the operational plan defined in section 9.3 of Appendix 1 Technical Specifications.

Q(2).3 Quality Management Plan, including relevant quality certification.

(Include your description here)

The bidder shall describe in the bid the quality management plan as required in section 9.5 of Appendix 1 Technical Specifications. The bidder shall also indicate any relevant quality certification hold by the company.

Documentation to be provided

Documents	Reference in bid	Delivered in bid
Quality management plan or ISO certificate		☐