

**TENDER SPECIFICATION OF UNMANNED AERIAL VEHICLE FOR
BANGLADESH AIR FORCE**

PART 1: GENERAL INFORMATION AND BIDDER'S RESPONSIBILITIES

Introduction

1. BAF has identified the need for UAV for Information, Surveillance, Reconnaissance and targeting (ISR) to meet future challenges and also to fulfill the requirement of the Forces Goal 2030. Such UAV will fulfill the requirement of effective mission capability in reconnaissance and surveillance role in full capacity. Suitable UAV was an outstanding requirement since the advancement of defense technology and its future implication in BAF. As such, BAF has planned to procure UAV with its associated equipments termed as UAS. This UAS would be mainly comprised of Air Vehicle (AV) and Ground Control Station (GCS). The AV will have complete automated flight capability and also can be remotely piloted from the GCS for information gathering, targeting and other functions.

2. For better understanding and to evaluate, all the prospective bidders on the same platform, the tender specification has been divided into three parts:

- a. Part-1: General Information and Bidder's Responsibilities.
- b. Part-2: Operational and Technical Specification (Essential and Optional Requirement).
- c. Part-3: General Terms and Conditions.

3. In Part-2, there are essential criteria and optional items. Bidders failing to comply with essential criteria will be disqualified. Higher margin in essential criteria than the base line mentioned would get preference provided the cost is not higher. However, Bidder has to quote price of all the optional items, but BAF may take some or all optional items as per the requirement. Price of optional features/items will not be considered for determining financial competitiveness.

4. Prospective bidders are to comply with the requirements, terms and conditions of the tender specification mentioned in Part-1, Part-2 and Part-3 of the tender specification. In order to help the bidders to participate, compliance sheet has been prepared and attached as annex B to this tender specification. The bidders are requested to provide the detailed explanation of the technical matters wherever necessary and cross-reference to relevant pages of their offer/original supporting documents. The bidder is also to provide performance/technical data, specific figures and information as asked against each clause/condition.

5. Prospective bidders are to submit their offer in the double envelopes system as per the DGDP's rule:

- a. Technical Offer.
- b. Financial Offer.

6. **Flight evaluation and Test firing of weapon system will be considered as part of technical evaluation:** Bidders fulfilling the technical criteria are to arrange evaluation flight for the performance evaluation of the offered UAV system as well as test firing of weapon systems at bidder's facilities/place. Bidder is to bear all necessary flying/test firing cost and internal transportation only. Bidders will be qualified on the basis of satisfactory technical evaluation, flight evaluation report and test firing of weapon system. Only qualified bidders will be eligible for evaluation of financial offers. On completion of technical evaluation, final selection of bidder will be done on the basis of financial competitiveness. BAF reserves the right to accept or reject any/all offers without assigning any reason.

7. Bidders shall quote all main equipment as mentioned in Part-2 in foreign currency on FOB basis.

Eligibility of the Bidders

8. The bidder is to participate in the tender through their local agent enlisted in the Directorate General of Defense Purchases (DGDP) in Bangladesh. A bidder is to be a reputed manufacturer of UAV or authorized by the manufacturer. If the bidder is a manufacturer, then the bidder is to submit an authentication certificate mentioning that they are the original manufacturer of UAV (mentioning brand and model of their produced UAV). If a bidder is not a manufacturer, then the bidder is to mention the name and address of the manufacturer and must submit a manufacturer's authorization certificate along with the offer to establish that they are authorized to participate in the tender process.

9. Each offer should contain only one type of UAV (Fixed wing) along with its accessories. One bidder may submit an alternative offer. Each offer must be independent and complete in all respects.

10. The bidder must provide Original Equipment Manufacturers (OEM) certificates of the UAV and all other items at the time of delivery (if any) and the same is to be shown to the pre-shipment inspection (PSI) team.

11. It is the responsibility of the bidder to have a valid Government Assurance Certificate that there is no restriction from the respective Government to export the offered UAV and its ancillary equipment to Bangladesh and export permit will be issued to the bidder if the contract is awarded.

Bidder's Responsibility.

12. Bidder is to comply with all the clauses of this tender specification. The bidder is to submit full specification and relevant documents, latest brochures of the UAV along with the offer. The information in brochures needs to be self-explanatory and must support and validate the information mentioned in the tender specification. Deviation or variation of information between the brochure and formally offered documents would be treated as non-compliance.

13. The bidders are to provide the detailed explanation of the technical and cross reference to relevant pages of their offer/original supporting documents. The bidder is to provide performance/ technical data, specific figures and information as asked against each condition of tender specification. In addition, the bidder is to mention compliance/ non-compliance against each condition. BAF preserves the right to reject those offers which

merely mention 'Complied/ Agreed' without highlighting required information/ data/ figures/ graphs as asked against each condition.

14. The bidder may **request** for clarifications on any issue relating to the information contained in the tender **specification** from Air Headquarters (Directorate of Plans) in writing with an information copy to DGDP and apply for a pre-bid meeting at DGDP/ BAF (if felt necessary) on pre-agreed **schedule** from the Directorate of Plans and DGDP.

15. **Pre-Bid Meeting.** A bidder may attend a pre-bid meeting at the Directorate of Plans, Air Headquarters within 04 (four) weeks from the day of floating the tender by DGDP. In this regard, bidder has to submit a request letter along with Biodata and passport detail to Director of Plans at least 03 weeks before the presentation for necessary security clearance. The purpose of the meeting will be to clarify issues about the project with particular attention to clarify different operational and technical aspect of the UAS and associated equipment. Points related to production time line, training and any other pertinent points may also be discussed with prior intimation to Dte of Plans.

16. **Evaluation Procedure.** A bid proposal submitted by the bidder will be evaluated primarily on the basis of (but not only) the following elements (not in any priority order):

- a. Compliance to eligibility criteria for bidding.
- b. **Responsiveness and compliance with the Technical Specifications, flight evaluation, test firing of weapon system and General Terms & Conditions.**
- c. Financial competitiveness.
- d. The lowest bidder will be determined from the technically accepted bidders as per the quoted price of the UAS which are mandatory to quote.

In addition to hard copy, the bidders are to submit the authenticated soft copy of the compliance sheet.

17. **Presentation by Bidder.** BAF may ask any to give a presentation at Bangladesh Air Force Headquarters any time after submitting the offer at bidder's expense. The presentation may cover detail aspects which have been covered in the bidder's proposal.

18. **Additional Features Offered by the Bidder.** The bidder may suggest and/or offer features for the system additionally supplied in this tender schedule. In this case, bidders have to explain the detailed advantage of that/those features of the system. Such additional offers by the bidders will be regarded as a competitive advantage for the bid if it incurs no additional cost.

19. **Acceptance/Rejection of Bid.** BAF reserves the right to accept or reject any offer or to annul the tender process and reject all bids at any time prior to signing of the contract.

PART-2: OPERATIONAL AND TECHNICAL SPECIFICATION**General Concept**

20. There has been increasing demand in modern world to use UAV as Intelligence, Surveillance, and Reconnaissance and target acquisition. Although requirement for UAVs changes based on the missions to be carried, expectations are generally similar for each type. In general, it should fulfill the requirement of achieving the objective with economy of effort. The level of maintenance resources in terms of manpower and material needed to support the UAV are to be minimum. All UAV system should fulfill certain basic requirements like performing efficient surveillance and reconnaissance missions for the Air Force, during day and night operations, operating in a wide range of weather conditions, various altitude operation, Beyond Line Of Sight (BLOS) operation, Real-Time operation and Multi-mission capability. Basing on these requirements the UAV system should match the parameters mentioned in subsequent paragraphs.

ESSENTIAL REQUIREMENT**AIR VEHICLE (FIXED WING)****Operational capability**21. **Speed:**

- a. Cruise speed: 140 km/h or above
- b. Minimum Loiter speed: 140km/h or lower
- c. Maximum Speed: 200km/h or higher (higher speed is preferential)

22. Maximum range with all up weight: 1000km

23. Rate of Climb and Maximum ceiling: ≥ 3.0 m/s and 6000m or better

24. Requirement of crew for op: max 07 (Including 02 X Pilots)

25. Endurance:

- a. With 3:1 ISR sensors: Minimum 15 hour
- b. With EO/IR sensor plus 2 X weapon load: Min 9 hrs (higher endurance is preferential)

26. Flight control:

- a. Full Autonomous with auto take off and landing
- b. Programmable
- c. Manual with auto stabilization
- d. Fail safe

27. Operating surface should be Runway. Operation from other surfaces like grass, unpaved runway would be an added advantage

28. Lanching system: wheeled

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29. Recovery system: Normally wheeled. The system must be equipped with emergency recovery system in case of major system failure (type to be mentioned)
30. Structural strength and Maximum 'g' tolerance: 3g or more
31. Wind sustainability: head wind 15 kts, cross wind 10 kts and tail wind 8kts or better.
32. Weight
 - a. Empty: To be mentioned by bidder
 - b. Nominal: To be mentioned by bidder
 - c. Maximum all up weight: To be mentioned by bidder
 - d. Payload: At least 120 Kg (higher payload is preferential)

Airframe

33. Wing
 - a. Wing Span length: To be mentioned by bidder
 - b. wing planform type: To be mentioned by bidder
 - c. Air foil: To be mentioned by bidder
 - d. Flaps: To be mentioned by bidder
 - e. Any other surface: To be mentioned by bidder
 - f. Hard point: Minimum two (2), four (4) hard points preferential

34. Fuseilage

- a. Length: To be mentioned by bidder
- b. Type: To be mentioned by bidder
- c. Empennage: To be mentioned by bidder
- d. Payload carrying space and max dimension:
 - Cabin 1: For EO/IR (dimension to be mentioned)
 - Cabin 2: For SAR or EW/ other sensors (dimension to be mentioned)
- e. Under sling tow operation : (to be mentioned)
- f. Construction material: material type to be mentioned
- g. Landing gear/ skid type: Tricycle
- h. Control surface actuators: To be mentioned by bidder, must have redundancy

35. **Fuel Tank**

- a. Capacity: To be mentioned by bidder, enough to cover the maximum endurance
- b. Feeding type: **To be mentioned** by bidder
- c. Refueling/ defueling arrangement: To be mentioned by bidder

Engine

36. **Propulsion type**

- a. Engine power: To be mentioned by bidder
- b. Engine rpm: To be mentioned by bidder
- c. Engine thrust: To be mentioned by bidder

37. **Propeller (if any)**

- a. Pitch: To be mentioned by bidder
- b. Diameter: To be mentioned by bidder

38. **Fuel**

- a. Type: To be mentioned by bidder
- b. Consumption rate (air and ground)
Take off: To be mentioned by bidder
Climb: To be mentioned by bidder
Cruising: To be mentioned by bidder
- c. Lubrication: To be mentioned by bidder

39. Starting arrangement: Self starting with internal battery and with external battery/GPU.

40. On board generator capacity: Sufficient power output for supplying power to mandatory and optional sensors/ equipment.

41. Maintenance cycle: 2000 hrs overhaul cycle or more.

Avionics

42. **Autopilot**

- a. Autopilot modes and capabilities:
 - (1) Onboard equipment monitoring and management.
 - (2) UAV state monitoring.

- (3) UAV flight control and navigation.
 - (4) Stabilize the attitude (pitch/roll/heading) and altitude of flight.
 - (5) Track control.
 - (6) Tele-control commands decode and telemetry encode.
 - (7) Auto taxiing, take-off and landing.
 - (8) Fail safe
 - (9) Auto/ programmable payload control
- b. Type: To be mentioned by bidder
- c. Model: To be mentioned by bidder
- d. Manufacturer: To be mentioned by bidder
- e. **Hardware configuration**
- (1) Processor speed: Intel-Military Standard / Industrial grade (To be mentioned by bidder)
 - (2) RAM: Military Standard / Industrial grade (To be mentioned by bidder)
 - (3) ROM: Military Standard / Industrial grade (To be mentioned by bidder)
 - (4) Memory: Programmable, Military Standard / Industrial grade (To be mentioned by bidder)
- f. Software upgradability: capable, Supplier must provide all patches, updates, bug fixes for the entire service life at free of cost
- g. **Sensors**
- (1). Gyro: vertical Gyro (solid state)
 - (2). Inertial: Inertial Navigation System
 - (3). GPS/ GNSS/other: DGPS receiver
 - (4). Any other sensor: To be mentioned by bidder
- h. Software configurability: Firmware Upload
- j. Source code to be provided (essential)
- k. Power requirement and source and maximum endurance: To be mentioned by bidder

- l. Inputs: GPS, Gyroscope, Inertial Navigation Unit , Radar altimeter, or more
- m. Outputs (ports, additional sensors or loads): Actuators, additional ports to add future payloads
- n. Must have redundant autopilot

43. **Data link.** The system must have dual (redundant) data links. If the main link fails, the secondary data link must take over automatically. Specification for the both link would be same. Specifications are:

- a. Data link frequency band: S/C band for primary link and UHF band for secondary link, or bidder may propose alternate suitable options.
- b. Type: Frequency Hopping Spread Spectrum (FHSS) or similar spread spectra type
- c. Anti jamming capability: Direct Sequence Spectrum Spread or similar
- d. Bandwidth: As required for system Downlink: At least 8Mbps, must have sufficient bandwidth to downlink Full HD resolution color video at 30 fps, ISR real time images, real time SAR data, all sensor data in addition to normal control and communication data at maximum range of operation.
- e. Encryption type: AES 256 bit (encryption key is to be configurable by BAF)
- f. Transmit power: To be mentioned by bidder
- g. Antenna type: Omni directional antenna for S/C band and Omni for UHF band or to be mentioned by bidder
- h. Maximum range: At least 200 KM with full bandwidth
- j. Power source: To be mentioned by bidder
- k. Power consumption rate: To be mentioned by bidder
- l. Interface type, both air and ground side: To be mentioned by bidder
- m. Hacking or spoofing protection
- n. **The system should have provision to integrate satellite data link in future.**

44. **EO/IR/LRF Link**

- a. Should share the same data link.
- b. **If different:** To be mentioned by bidder
 - (1) Frequency

- (2) Anti jamming
- (3) Transmission type
- (4) Power requirement and source
- (5) Transmit power
- (6) Antenna type
- (7) Range: Must be at least 200 KM .

Payloads

45. Camera/ Surveillance equipment and IR with Laser Range Finder and Laser Designator

- a. Manufacturer and Model: To be mentioned by bidder
- b. Number of sensors: To be mentioned by bidder
- b. Low light capability
- c. Surveillance camera must provide Full HD video output at 30 fps
- d. IR: Day and night capability at 0 lux
- e. Pan / Tilt/ Zoom: 20~400 mm, continuous zoom, auto white balance or better
- f. Ground resolution: 0.1 m (@FOV=0.6deg, Altitude: 5000 m) or better
- g. Picture element resolution: 0.25 m (Altitude: 5000 m, visibility: 15 km) or better
- h. Maximum speed-height ration: $\geq 50^\circ/\text{s}$
- i. Single photography area: 1 km x 1 km (@FOV=14deg, Altitude: 5000 m) or better
- j. IR effective range for target: (target size - Human target)
 - (1) Detection range: Min 8 km
 - (2) Identification range: Min 5 km
- k. Visible light camera effective range for target (target size - Human target)
 - (1) Detection range: Min 15 km
 - (2) Identification range: Min 10 km
 - (3) Measurement distance: Min 10 km

- (4) Accuracy: 10 m or better
- (5) Power consumption: To be mentioned by bidder

46. **SAR**

- a. Manufacturer and Model: To be mentioned by bidder
- b. Continuous operation hour: 4 hours or more
- c. Operation distance resolution bandwidth: as below or better

SAR Mode	Range	Resolution	Image width
Strip	20km	3m×3m	6-8km
	20km	1m×1m	2km
Spot	10km	0.5m×0.5m	500m×500m

- d. GMTI: Must be able in clutter, minimum detectable velocity 20 kph, flight speed 170 kph, minimum detectable velocity =20km/h
- e. Frequency: Ku or suitable band
- f. Output power: To be mentioned by bidder
- g. Power source and consumption rate: To be mentioned by bidder

47. **Transponder**

- a. Manufacturer and Model no: To be mentioned by bidder
- b. ID/Squawk facility
- c. Visible to TCAS: Preferable (S mode)
- d. Mode A and Mode C: Must be capable
- e. Military mode: Preferable, details to be mentioned
- f. Power source and consumption rate: To be mentioned by bidder

48. **Armament capability.** Following provisioning is mandatory:

- a. Integrated with laser range finder and laser designator
- b. Hard point: 2/4
- c. Supported armament type: Air to ground missile and precision guided bomb
- d. Training missile

49. **EW pods**

- a. Supported pods: At least **support** ELINT, RWR and chaff/flares dispenser (the provisioning is mandatory). **Other** pods are mentioned in optional requirement.

b. ELINT.

- (1) Frequency range: 1 Ghz to 18 GHz or better
- (2) Coverage: At least $\pm 45^\circ$ horizontal and -30° to 0° elevation
- (3) Receiver sensitivity: -70 dBm or better
- (4) DF accuracy: 2° or better

c. RWR.

- (1) Warning frequency: 2 GHz to 18 GHz
- (2) Coverage: 360° horizontal and 0° to $\pm 40^\circ$ elevation or better
- (3) Needs to be integrated with Chaffs/flares dispenser. Received radar frequency needs to be visible in GCS

d. Chaffs and Flares (to be mentioned by bidder)

GROUND CONTROL STATION (GCS)

50. Type (Mobile) All software used in the system, including in the aircraft, must have perpetual license. That means all the software licenses must never expire. Bidder will have to provide all bug fixes, patches, updates throughout the entire service life of the system at free of cost.

51. Capabilities

- a. Launch: flight control console
- b. Flight control: flight control console
- c. Recovery: flight control console
- d. Real time telemetry: data link monitoring console
- e. Should be able to receive, display and exploit data from all payloads.

The data link can transmit the data of EO/IR payload and SAR simultaneously

- f. Emergency action plan in case of failure of any system: emergency homing if data link failed and other emergency handling procedures
- g. Recording capability: Ability to store data for at least 30 days
- h. Should have capability to Receive, display and exploit data from payload
- j. Warning system for any type of unsafe op or parameter set or failure
- k. Mission plan
 - (1) Generate and upload by wire or wireless: wireless and real time
 - (2) Validate mission plan (warning if anything beyond limit): capable
 - (3) Dynamic mission plan (change in flight): upload in real time
 - (4) Geo fencing: capable

l. GCS should **be able to** uplink data to Command Headquarters, if suitable link is provided by BAF. **Bidder** is to include all necessary hardware and software (including license).

m. The GCS **must be able to** communicate with ATC tower and radar station through suitable VHF RT.

52. **Control System**

- a. Standard Control stick
- b. Throttle

53. **Operating system**

- a. Name: To be mentioned by bidder
- b. Version: To be mentioned by bidder
- c. Future upgradable: Yes

54. **Software type**

- a. Configurable: capable
- b. Open source: no
- c. Source code: To be provided
- d. Future upgradable: capable

55. **Simultaneous Operation**

- a. One UAV at a time, two will be preferable
- b. Should be capable to Hand over to next ground station in case of cascaded ground stations

56. **Vehicle**

- a. Vehicle type: To be mentioned by bidder (Right hand drive preferable)
- b. Model and manufacturer: To be mentioned by bidder
- c. Chassis type: To be mentioned by bidder
- d. Engine, Type model and manufacturer: To be mentioned by bidder
- e. Must have Air condition run by independent power source (not by vehicle eng) will be added advantage

57. **Repair maintenance facility on board**

- a. Should be equipped with necessary tools for upto second line maintenance
- b. Should be equipped with necessary Problem analyzing hardware/software

58. **Power for the full ground station**

- a. Source: Must have Generator, should have provision for external AC source (220 V AC) 50 Hz, single phase
- b. Consumption rate: To be mentioned by bidder
- c. Redundancy: Redundancy for the generator preferable
- d. Earthing and grounding: capable

59. Maximum operation hour: >30hrs

60. **Safety and security**

- a. EW protection specially protection against homing missile: Radar Warning Receiver and Self Protect jamming pods
- b. Anti jam and anti spoofing capability: Direct Sequence Spectrum Spreader better (to be mentioned by bidder)

Other Maintenance and Structural Factors

61. **Airframe Geometry.** The UAV is to be of such structure and design with essential features which will withstand its maximum speed. The airframe should be stable in nature. The airframe should offer additional gliding 'Performances in case of recovery from engine failure. It would also be of such design that It can fly with longer endurance with minimal fuel cost. The UAV is to have tri-cycle type under carriage assemblies which may be retractable or non-retractable. The structure may be built of metal alloy/carbon fiber/composite. The airframe design should be such that it contributes minimum RCS and IR signature. All the essential flight control systems are required to be available such as primary control surfaces for safe handling and better control of UAV.

62. **Environmental condition.** Due to hot and humid environment in Bangladesh, all the equipment including payloads and compartment should preferably be weather proof/sealed.

- a. Temperature Operation:
 - 20°C ~ +50°C (Airborne equipment)
 - 0°C ~ +55°C (external equipment)
 - 0°C ~ +50°C (Ground equipment)
- b. Humidity: 95% and above
- c. Precipitation: To be mentioned by bidder
- d. Dust: To be mentioned by bidder
- e. Must be capable for sustained high temperature and humid costal/ maritime operation.

63. **Structural Strength and Life:** The UAV is to meet the following requirements:

- a. The airframe should have sufficient strength to withstand stress of take-off, landing and required in flight maneuverability with maximum payload.

- b. The ops life is not to be less than 6000 hrs and 1200 landings (actual to be mentioned).
- c. The UAV engine, all its equipment/component/accessories must be new and manufactured not earlier than November 2017.
- d. Calendar life of the UAV is not to be less than 15 years.
- e. Time before overhaul (TBO) should not be less than 2000 hrs/5 yrs.

64. **Reliability and Maintainability**

- a. Failures per 1000 hours: To be mentioned by bidder.
- b. Maintainability: Average direct maintenance requirement not greater than 10 MMH for each failure

65. **Survivability and vulnerability**

- a. Small visual silhouette
- b. Small IR signature
- c. Small RCS: To be mentioned by bidder
- d. Less electronic emission: To be mentioned by bidder
- e. Less acoustic emission: To be mentioned by bidder

66. **Interchangeability and Modularity**

- a. Same part no of same manufactures must match
- b. Modularity: the airborne equipment, payload and armaments are module and easy to remove and install.

67. **Publications**

- a. Operation Manual: Aircraft Flight Manual
- b. Maintenance manual: Aircraft Maintenance Manual
- c. Troubleshooting manual: Fault Isolation Manual
- d. Parts catalog: Illustrated Part Catalog
- e. Bulletin: Service Bulletin

LOGISTIC SUPPORT

68. **Support Considerations.** Uninterrupted logistic support is essential for full operation life of the aircraft. The logistic objectives are to make best use of the existing logistic support resources as long as the aircraft remains in service. BAF should acquire

various information regarding logistic support from the manufacturer so as to find out the best use of the system. The following are required:

- a. Information. For official use, the manufacturer are to make available to BAF all development and production information including basic material data, software and licensed product, of every item in the main equipment and in its supporting equipment.
- b. Repair/Overhaul. The supplier is to provide the list of authorized overhauling/repair organizations for repair or overhaul of aircraft, engine and its component.
- c. Spares and Equipment. The expected service life of the aircraft is 15 years or more. It is essential that the manufacturer gives guarantee of providing aircraft, engine and various components required by BAF, either produced by them or by any third party organization, throughout the aircraft service life. The initial provisioning list, illustrated parts catalogue and price catalogue are also essential for smooth logistic support for uninterrupted air operation. **The bidder is to provide the critical backup spares which will be required for uninterrupted operation of the system for 02 (two) years after warranty period.** Turn-around time for warranty repair/replacement should not exceed 30 days. The bidder is to replenish within the expiry of warranty period if any of the critical backup spares are required or consumed from BAF inventory during warranty period.
- d. Consumable Items. A full range of consumable items including POL is to be made available at the user base at least one month before the UAV is inducted in the service. The list of items along with their consumption rate per 100 hour flying to be provided by the bidder.
- e. Publications. Operational and technical publications, parts catalogue etc are required by BAF before the aircraft is inducted for logistic support system. The price list of entire range of equipment/components is required before the final contract. The manufacturer is to inform BAF, any up-gradation of the items, changes of components used in the aircraft in the shortest possible time. In this regard BAF is required to know the exact system that is followed by the manufacturer through the automatic publication distribution. The manufacturer is to provide 2Xset of each publication in English version in both hard and soft copies. Delivery of technical Order/ Bulletin etc are to be provided free of cost during the entire life cycle of aircraft.
- f. Support Cost. Support cost generated within the life cycle of the UAV system/equipment/weapon systems are to be demonstrated. These costs are to include operating energy costs and the system is to be shown to be energy efficient.
- g. Transportability. The aircraft equipment, including appropriate packaging is to be transportable by land, sea or air. The packages are to be small and as light as possible and must be capable of being dealt with expeditiously by handling equipment likely to be available at the dispatching and receiving airfields. The packages must be capable of movement on airfields, roads and tracks. It is essential that the packaging is such that the equipment can be unpacked easily and quickly in order not to delay aircraft generation and turn-around times.

ASSOCIATED TRAINING AND EQUIPMENT

69. **UAV Pilot Training.** The manufacturer is required to arrange training for 05 BAF Pilots (1 x Team Leader + 4 x Pilot) for eight (08) weeks before the shipment of the UAV to Bangladesh. The training is required to be exhaustive and should include both theoretical classes and **actual** operation of the Aerial Vehicle from Ground Control Station (GCS). Additionally, **simulator** flying (if available) should also be included.

70. **Technical Officers and Ground Crew Training.** The manufacturer should arrange training of 04 x BAF technical officers and 11 x technicians for eight (08) weeks before shipment of the aircraft to Bangladesh. So that, they can accomplish pre-flight, post-flight and thru flight inspections of the UAVs in Bangladesh. They are also to be trained to carryout rectification/servicing up to 2nd line maintenance and be able to operate, repair and rectify testers and test equipment to be used during periodic maintenance. In this regard, the manufacturer is to arrange training to BAF Technical team of 1st line and 2nd line maintenance. 1st line and 2nd line maintenance training may be arranged in the factory.

Note:

- i. The bidder is to mention detailed breakdown of the training with syllabus, including the schedule and place of training. The medium of training should be in English language.
- ii. BAF will have the option to accept/reject/modify/discard all or part of the training schedule/syllabus.
- iii. The bidder is to provide a detail plan of conducting training highlighting the subject wise (based on equipment basis) period requirement, no of hours including theoretical and practical training as per the group. The bidder is to prepare detail syllabus and submit with the offer.
- iv. The training manuals are to be prepared in English and forwarded to BAF for approval at least 30 days prior to start training.
- v. The bidder is to plan and conduct the training program with UAV in operational condition where all the major components will be available.
- vi. The bidder is to arrange visiting manufacturer area of all major components during conducting training.

71. **Training Cost.** All relevant costs for training (total 20xpersonnel) are to be quoted separately by the bidder on the following heads:

- a. **Pilots/Operators Training.** Break down of training cost for single person and as a group with indication of the total number of trainees in the group along with number of days.
- b. **Technical Training.** The cost of technical training for 01xperson, and as a group, for different category of technical personnel and for different level (1st, and 2nd level) of maintenance training to be mentioned in details.

c. **Accommodation, Food and Transportation.** BAF will provide both way air tickets for the trainees up to the manufacturer's premises/training institute. The bidder is to provide suitable accommodation (single room for the officers and a twin room for airmen in minimum three star standard hotel), food, internal all types of transportation and medical facilities. The bidder is to quote the price for accommodation and food separately.

72. **Associated Equipment.** The following equipment associated with this requirement is needed:

- a. Testers/Test equipment and tools for operation and 1st and 2nd line maintenance of all systems of the aircraft.
- b. Special type ground handling equipment/tools required for all the systems for operation and 1st and 2nd line maintenance.
- c. Backup spares and periodic replacement required for two (02) yrs for uninterrupted operations.

OPTIONAL REQUIREMENT

73. **COMMINT.**

- a. Reconnaissance frequency range: 30 MHz -2700 MHz or better
- b. DF frequency: 100 MHz -2700 MHz or better

74. **Communication Jammer.** Communication Jammer with the range of 20km, type and specification to be mentioned by bidder.

75. **Optional payload.**

- a. Communication Relay system: To be mentioned by bidder
- b. ELT (Emergency Locator Beacon): To be mentioned by bidder.
- c. Live Missile system including necessary tester and test equipment. Missile type and specification are to be mentioned by bidder.
- d. Compatible guided bomb: Type and specification are to be mentioned by bidder.
- e. Practice missile and practice guided bomb: Type and specification are to be mentioned by bidder.

76. **Control System.**

- a. Foot pedal type Rudder preferable.
- b. Force feedback preferable.

77. Interface with outer world.

a. C3 system: Ground Control Station

b. Receive process and transmit tactical info: capable

78. Maritime Capability.

a. Capability to operate in maritime domain: To be mentioned by bidder.

b. Additional requirement to control from ship/marine vessel: To be mentioned by the bidder.

79. List of Backup Spares for 05 Yrs Op. The bidder is to submit with the offer the

list of spares for the full system with prices needed for 5 years maintenance support after warranty period. BAF authority will decide about the procurement of these spares. This quote will not be considered for deciding the bidder's financial position.

80. Training and Maintenance Tools for 3rd Line Maintenance. Supplier is to

arrange separate 08 x weeks training for 3rd line maintenance after completion of TST period at the manufacturer's premises. BAF will nominate 01 x Team Leader (GD(P) offr), 02 x Engg Officers and 06 x Technicians out of 04 x Engg Officers and 11 x Technicians mentioned in paragraph 70. This training will include component level fault finding, rectification and total transfer of technology. Supplier is to provide detailed syllabus of the 3rd line maintenance training before 03 months of ending TST duration. Bidder is to quote separately for the cost of 3rd line maintenance training, price list of 3rd line repair & maintenance tools. BAF will have full authority to accept/reject/partially accept the proposal.

81. Stand By GCS In addition to standard GCS, bidder is to quote for a 'stand by GCS'. The stand by GCS will be deployed in another base other than the main operating base. The stand by GCS should have bare minimum facilities to extend the range as well as control and land the aircraft other than the main operating base. Bidder is to include all necessary networking equipment (if required). Detail specification to be given by bidder.

82. On site Project development (OSPD) Team. A BAF team having experience on R&D related to UAV comprising of 01 x Pilot, 01 x Engg (M) and 01 x Engg (E) will stay at manufacturing site during the following stages of UAV manufacturing for effective technology transfer:

a. Major component production

b. Assembling

c. System Integration

d. Functional Check and calibration.

Modification and Growth Potential

83. There should be scope of future modification if deemed necessary. Easiness in improvement is a desirable criterion. The UAV system must facilitate upgrading to accommodate various sensor payloads. The growth potential should cover the following areas:

- a. Extended payload range.
- b. Air Vehicle capability for spare weight, volume and power consumption.
- c. Air vehicle capability for spare interfaces with avionics system.
- d. Data link bandwidth capabilities.
- e. Ground system capability for operating future payloads.
- f. Computer resource reserved capabilities for memory, timing etc.

84. Price quoting for all the optional items as mentioned in paragraph 73, 74, 75, 77, 79, 80, 81 and 82 is mandatory. BAF will have the option to accept / reject / modify / discard all or any of the above mentioned services / items.



PART – 3: GENERAL TERMS AND CONDITIONS

85. **List of User Countries.** The offered model of equipment must be used in minimum 03 foreign countries (outside the country of origin). A certificate needs to be provided in this regard.

86. **Performance Evaluation of Offered UAV before Shipment.** As part of actual performance evaluation before shipment, the bidder is to arrange a performance evaluation flight including live weapon delivery of the UAV for BAF team in user/manufacturers designated country. All expenses of the test flight and test firing including cost of weapon and internal transportation of BAF personnel will be borne by the bidder. Air tickets, accommodation and meal of BAF team will be borne by BAF. The Bidder is to intimate BAF at least 45 days in advance about the visit schedule, location and duration.

87. **Installation of Equipment at Selected BAF Location/Base.** The equipment is to be installed by the bidder at the designated base of Bangladesh Air Force (BAF). The newly installed UAS has to be handed over to BAF in serviceable and operational condition. FCF, calibration of UAV & all necessary equipment has to be completed.

88. **Stage Inspection Team (SIT).** Once the contract is signed, two (02) x stage inspections will be carried out by BAF. The bidder is to specify tentative duration of the assembling of the UAV and its major equipment. All expenses of the team will be borne by BAF. The bidder is to intimate at least 60 days in advance about the schedule of the SIT. Details as follows:

- a. First SIT will be carried out after 40% to 50% assembly is completed. 05x BAF members for 07 working days (excluding journey period) will carry out the SIT.
- b. Second SIT will be carried out after 70% to 75% assembly is completed. 05x BAF members for 07 working days (excluding journey period) will carry out the SIT.

89. **Pre-shipment Inspection (PSI).** Before shipment of the consignment a pre-shipment inspection of the complete UAV and its associated items will be carried out by a nine (09) x member PSI team from BAF at the manufacture's factory for the duration of 10 x working days (excluding journey period). The PSI team will depart Bangladesh as per schedule submitted by the Bidder. All expenses of the team will be borne by BAF. The Bidder is to intimate BAF at least 60 days in advance about the PSI schedule.

90. **Shipment/ Delivery.** The contracted UAV and its associated equipment/items are to be delivered to the BAF designated base within eighteen (18) months after signing the contract.

91. **Warranty/Guarantee.** The bidder must ensure the following in their offer:

- a. The bidder is to provide minimum 01 year warranty for trouble free operation of the entire UAV system including ancillary equipment from the date of acceptance of the system/equipment by BAF. The period of un-serviceability of the UAS up to 24 hours in aggregate will be deemed as normal but more than 24 hours will be deducted from the period of trial run and warranty period for the purpose of respective period calculation. The bidder is to provide a warranty certificate in this regard.

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b. Any item or equipment found unserviceable/defective during warranty period, the bidder is to replace/repair the same free of cost within 15 days from the date of reporting. If UAS remains U/S for the item, the time would not be calculated for counting warranty period and TST.

c. During the whole warranty period, any un-serviceability of the UAS more than 48 (forty eight) hours will be added together and thus, if the period of un-serviceability exceeds 60 days then 5% of the LC value will be forfeited as a penalty.

d. Both ways freight and insurance charges are to be borne by the bidder for the warranty replacement items.

e. If the bidder fails to repair/replace an item/equipment under warranty claim within the stipulated period (30 days) then the warranty period would be extended by the number of days delayed in repair/replacing the items/equipment under warranty to make the total warranty period for 01x year.

f. If any replaced equipment is found not as per design and not functioning as per operational requirement, the item is to be replaced by the supplier. No modification of the item will be accepted.

92. **Detailed Work Plan.** The supplier shall provide a detailed work plan for UAS manufacture, stage inspection, assembly, training, test flight, test firing, acceptance check and shipment/delivery of the system and other items/equipment. The work plan shall contain detailed information of preparation and activities to be accomplished by the supplier. The detailed work plan is to be delivered to BAF within 30 days of contract award.

93. **Installation and Commissioning.**

a. The bidder will send an installation team to Bangladesh for the assembly and installation of UAS. Necessary harness, fittings, diagram and any other necessities are to be provided by the bidder for installation. During installation, any damage, burnt-out or de-shaped part, equipment or spare should be replaced with a new one; no repaired or modified item will be accepted.

b. After completion of installation of the UAS, the bidder shall carry out a detail test of all the equipment of the UAS in presence of BAF experts. Turn-around time for completion of installation will be maximum 30 days from the date of arrival of all equipment at installation base.

c. After completion of Installation and detail test, calibration of all the equipment of the UAS system, the Bidder will confirm the UAS readiness for Commissioning Test Flight. The bidder shall provide technical assistance as required to support initial Commissioning Test Flight of UAS. In coordination with BAF and appropriate technical personnel, Bidder shall make adjustments and calibration to the equipment, as required. It is estimated that this support will require ten (10) on-site workdays.

d. All cost for installation team including food, internal transportation, medical care etc is to be borne by the bidder. However, accommodation, food in BAF Messes for required personnel may be provided on payment basis.

94. **Functional Check Flight (FCF)/Operational Check.** FCF/Operational check of UAV and its associated equipment will start after the satisfactory commissioning test flight and will be carried out by BAF experts and the bidder/representative. The Functional /Operational check will be carried out by each aerial platform with different configuration. Satisfactory flying hour for each aerial platform must not be less than 25 hours. The Calibration of the UAS may be carried out during the functional/operational check. During the Functional/Operational check, all operational parameter mentioned in the contract will be checked. (Further detailed discussion may take place in pre-bid meeting).

95. **Acceptance Check.** Acceptance will be carried out after the satisfactory FCF. During FCF, if, the system is found unsatisfactory, acceptance will be held up till the same is corrected.

96. **Technical Support Team (TST).** The bidder is to keep a TST (Technical Support Team) to repair/rectify any fault/un-serviceability of the UAS during warranty period. Minimum 02xmember TST is to be there in the team for entire warranty or with bidders own expense. The TST will rectify all problems encountered in the UAS equipment during that period and will provide "On site Practical Training" to the BAF technicians and operators for smooth technology transfer of the UAS. The TST will provide certificates to BAF technicians and operators in this regard. No extra cost would be considered for this. The number of TST members including interpreter (if any) and their duration of staying at BAF base along with the cost are to be mentioned separately in the offer. The bidder shall bear all related cost of air tickets, food, medical, accommodation and transportation etc for the members of TST and the interpreter (if any). BAF shall provide the local transportation for the team within BAF area. However, BAF may arrange accommodation & fooding at BAF facilities on payment by bidder.

97. **Miscellaneous Terms & Conditions.** The following miscellaneous terms and conditions are to be followed:

- a. The bidder must mention the name and full address of the local agent (if any) in the offer.
- b. Compliances/Non-compliances is to be mentioned against each tender clause.
- c. BAF/DGDP reserves the right to increase/decrease quantity of items and accept/reject any/all tender without assigning any reasons.
- d. The cost of UAS including all charges is to be 'Firm and Fixed'.
- e. Freight will be paid at actual, but not more than the contracted freight.
- f. Cost of freight and insurance for any surplus spares/modules/accessories, which will be taken back after completion of installation of UAS, is to be borne by the bidder.
- g. Delivery schedule mentioned in the tender specifications may be changed by DGDP/BAF due to delay in concluding the contract. Delivery period of the UAS will be 18 months after signing the contract.

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h. The bidder must mention the prices in USD (except for the local currency, items/services) unit wise which is to be firm and fixed. No increase in price at any stage after submission of offer will be accepted by BAF.

j. The bidder is to quote the freight charge by sea or air up to Chittagong/Dhaka, Bangladesh. The local transportation of UAS in Bangladesh (From the port of arrival to the designated BAF base) is to be arranged and paid by the bidder.

k. The bidder is to mention the port /country of shipment.

l. The transshipment is not allowed, but if the bidder needs transshipment then they are to mention it in their offer about their requirement. In case of such requirement transshipment will only be allowed under single AWB/BL.

m. Part shipment is allowed but part payment is not allowed.

98. **Payment Terms.** 100% Payment (except payment in local currency) will be made through irrevocable LC opened with scheduled bank in Bangladesh and negotiating bank recommended by the bidder under following terms and conditions:

a. 40% of the LC value (minus the cost of TST, installation of equipment and Trg) may be released on production of following documents:

(1) Clearing/original Bill of lading/ Air way Bill issued by the carrier in 06 Copies (With one original). Freight amount must be shown in the Bill of lading /Air way Bill. Otherwise only FOB/ FCA value will be paid.

(2) Bidders invoice 06 copies (with one original).

(3) Packing list 06 copies (with one original).

(4) Original certificate from Chamber of Commerce or certificate of authorization for exporting of military goods06 copies (with one original).

(5) Manufacturers' Factory/bidders Inspection Report / certificate 06 copies (with one original).

(6) Bidders Warranty/ Guarantee certificate06 copies (with one original).

(7) Pre-shipment Inspection certificate signed by the BAF member of PSI Team06 copies (with one original).

b. 40% of the LC value (minus the cost of TST, installation of equipment and Trg) may be released on satisfactory acceptance of all the items in serviceable condition and after completion of installation, calibration and Functional Test Flight (FCF) of the UAS at BAF Site and submission of CRV.

c. 20% of the LC value (minus the cost of TST, installation of equipment and Trg) may be released after the expiry of the warranty period.

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- d. 100% cost of training may be released after satisfactory completion of training as per the contract.
- e. 100% cost of TST may be released after satisfactory completion of TST service as per the contract.
- f. 100% cost of installation will be released on completion of installation job and after getting installation completion certificate from user/BAF.

99. Advance Payment option. This option will be applicable for lowest bidder only. In case of 30% advance payment, bidder may quote the discounted price separately.

100. Replacement Assurance. Supplier is to replace unused items of 02 years critical back up spares, if found not used during 02 years operation after warranty with the spares which is consumed during this period and likely to be required in future also.

101. Vendors List. Full address of the vendors including FAX number and e-mail address are to be provided for all vendor items, used in UAS.

Financial Offer

102. All costs are to be mentioned in US dollars (USD) in FOB basis.

103. Quoting price of the followings is essential:

- a. Cost of UAS which included 03x areal platforms, GCS and all necessary equipment at BAF side which is required to meet the essential operational parameters mentioned in this tender specification. Cost of all essential payloads is to be mentioned individually. In addition, the bidder has to quote for per additional areal platform.
- b. Price of total Training package as mentioned in essential requirements at paragraph 69,70 including breakdown mentioned in paragraph 71 (a-c).
- c. Cost of testers, main tools, back up spares mentioned in 72 (a-c).
- d. Cost of all Optional Requirements mentioned in paragraph 73, 74, 75, 77, 79, 80, 81 and 82. Cost of all optional payloads is to be mentioned individually.
- e. Cost of shipment by Sea/Air as mentioned in paragraph 90.
- f. Cost of Technical Support Team (TST) as mentioned in paragraph 96.

Note: BAF will reserve the right to accept or reject any items/tools/accessories/tester and ground equipment from the offer. In addition, BAF will also reserve the right to ask the bidder to supply any provisioning/equipment whose price are asked to quote in the financial offer.

104. Factor for Determining the Lowest Bidder. The bidder must comply with all essential and optional requirements to be eligible for lowest bidder. The bidder shall quote the price of the items as mentioned below, which will be considered for determining the lowest bidder:

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- a. Price of UAS and all other associated equipment/items including installation at BAF base/site which is required to meet the essential operational characteristics mentioned in this tender specification.
- b. Price of total Training package as mentioned in essential requirements including breakdown in paragraph 71 (a-c).
- c. Cost of testers, main tools, back up spares mentioned in 72 (a-c).
- d. Cost of shipment by Sea/Air as mentioned in paragraph 90.
- e. Cost of Technical Support Team (TST) as mentioned in paragraph 96.
- f. Discounted price in case of advance payment option mentioned in paragraph 99 will not be considered for determining the lowest bidder.

105. Offer must remain valid for minimum 180 days from the date of tender opening. Within the validity of the offer, withdrawal of offer or unwillingness to sign the contract by the bidder is not accepted and in such cases action would be taken against the principal bidder and local agent as per DGDP's rules.

106. BAF/DGDP has all the rights to select any bidder or cancel the whole tender process at any time without assigning any reason.

COMPLIANCE SHEET OF FIXED WING UNMANNED AERIAL VEHICLE (UAV) SYSTEM

Tender Clause No	OPERATIONAL AND TECHNICAL SPECIFICATION ESSENTIAL REQUIREMENT	Bidder's Response
<u>Operational Specification</u>		
	<u>Speed:</u>	
21.	a. Cruise speed: 140km/h or above	
	b. Minimum Loiter speed: 140km/h or lower	
	c. Maximum Speed: 200km/h or higher (higher speed is preferential)	
22.	<u>Range.</u> 1000km with max all up weight.	
23.	<u>Rate of Climb and Ceiling.</u> $\geq 3.0m/s$ and 6000m or better	
24.	<u>Requirement of crew for op.</u> max 07 (Including 02 X Pilots)	
25.	<u>Endurance:</u> a. With 3:1 ISR sensors: Minimum 15 hour	
	b. With EO/IR sensor plus 2 X weap on load: Min 9 hrs (higher endurance is preferential)	
26.	<u>Flight control:</u>	
	a. Full Autonomous with auto take off and landing	
	b. Programmable	
	c. Manual with auto stabilization d. Fail safe	
27.	<u>Operating Surface.</u> Operating surface should be Runway. Operation from other surfaces like grass, unpaved runway would be an added advantage	
28.	<u>Landing system.</u> wheeled	
29.	<u>Recovery system.</u> Normally wheeled. The system must be equipped with emergency recovery system in case of major system failure (type to be mentioned)	
30.	<u>Structural strength and Maximum 'g' tolerance.</u> 3g or more	

31.	<u>Wind sustainability.</u> head wind 15 kts, cross wind 10 kts and tail wind 8 kts or better.	
32.	<u>Weight:</u> a. Empty: To be mentioned by bidder b. Nominal: To be mentioned by bidder c. Maximum all up weight: To be mentioned by bidder d. Payload: At least 120 Kg (higher payload is preferential)	
Airframe		
33.	<u>Wing:</u> a. Wing Span length: To be mentioned by bidder b. Wing planform type: To be mentioned by bidder c. Air foil: To be mentioned by bidder d. Flaps: To be mentioned by bidder e. Any other surface: To be mentioned by bidder f. Hard point: Minimum two (2), four (4) hard points preferential	
34.	<u>Fuselage:</u> a. Length: To be mentioned by bidder b. Type: To be mentioned by bidder c. Empennage: To be mentioned by bidder d. Payload carrying space and max dimension: Cabin 1: For EO/IR (dimension to be mentioned) Cabin 2: For SAR or EW/ other sensors (dimension to be mentioned) e. Under sling tow operation : (to be mentioned) f. Construction material: material type to be mentioned g. Landing gear/ skid type: Tricycle h. Control surface actuators: To be mentioned by bidder, must have redundancy	
35.	<u>Fuel Tank:</u> a. Capacity: To be mentioned by bidder, enough to cover the maximum endurance b. Feeding type : To be mentioned by bidder c. Refueling/ defueling arrangement: To be mentioned by bidder	

<u>Engine</u>	
36.	<p><u>Propulsion type:</u></p> <ul style="list-style-type: none"> a. Engine power: To be mentioned by bidder b. Engine rpm: To be mentioned by bidder c. Engine thrust: To be mentioned by bidder
37.	<p><u>Propeller (if any):</u></p> <ul style="list-style-type: none"> a. Pitch: To be mentioned by bidder b. Diameter: To be mentioned by bidder
38.	<p><u>Fuel:</u></p> <ul style="list-style-type: none"> a. Type: To be mentioned by bidder b. Consumption rate (air and ground) Take off: To be mentioned by bidder Climb: To be mentioned by bidder Cruising: To be mentioned by bidder c. Lubrication: To be mentioned by bidder
39.	<u>Starting arrangement.</u> Self starting with internal battery and with external battery/GPU
40.	<u>On board generator capacity.</u> Sufficient power output for supplying power to mandatory and optional sensors/equipments
41.	<u>Maintenance cycle.</u> 2000 hrs overhaul cycle or more.
<u>Avionics</u>	
42.	<p><u>Autopilot:</u></p> <ul style="list-style-type: none"> a. Autopilot modes and capabilities: <ul style="list-style-type: none"> (1) On board equipment monitoring and management. (2) UAV state monitoring. (3) UAV flight control and navigation. (4) Stabilize the attitude (pitch/roll/heading) and altitude of flight. (5) Track control. (6) Tele-control commands decode and telemetry encode. (7) Auto taxiing, take-off and landing.

	<p>(8) Fail safe.</p> <p>(9) Auto/ programmable payload control.</p> <p>b. Type: To be mentioned by bidder.</p> <p>c. Model: To be mentioned by bidder.</p> <p>d. Manufacturer: To be mentioned by bidder.</p> <p>e. <u>Hardware configuration:</u></p> <p>(1) Processor speed: Intel-Military Standard / Industrial grade (To be mentioned by bidder).</p> <p>(2) RAM: Military Standard / Industrial grade (To be mentioned by bidder).</p> <p>(3) ROM: Military Standard / Industrial grade (To be mentioned by bidder).</p> <p>(4) Memory: Programmable, Military Standard / Industrial grade (To be mentioned by bidder).</p> <p>f. Software upgradeability: capable, Supplier must provide all patches, updates, bug fixes for the entire service life at free of cost.</p> <p>g. <u>Sensors:</u></p> <p>(1). Gyro: vertical Gyro (solid state).</p> <p>(2). Inertial: Inertial Navigation System.</p> <p>(3). GPS/ GNSS/other: DGPS receiver.</p> <p>(4). Any other sensor: To be mentioned by bidder.</p> <p>h. Software configurability: Firmware Upload.</p> <p>i. Source code to be provided (essential).</p> <p>j. Power requirement and source and maximum endurance: To be mentioned by bidder.</p> <p>k. Inputs: GPS, Gyroscope, Inertial Navigation Unit, Radar altimeter, or more.</p> <p>l. Outputs (ports, additional sensors or loads): Actuators, additional ports to add future payloads.</p> <p>m. Must have redundant autopilot.</p> <p>n.</p> <p><u>Data link:</u> The system must have dual (redundant) data links. If the main link fails, the secondary data link must take over automatically. Specification for the both link would be same. Specifications are:</p> <p>a. Data link frequency band: S/C band for primary link and UHF band for secondary link, or bidder may propose alternate suitable options.</p> <p>b. Type: Frequency Hopping Spread Spectrum (FHSS) or similar spread spectra type.</p> <p>c. Anti jamming capability: Direct Sequence Spectrum Spread or similar.</p>	
<p>43.</p>	<p><u>Data link:</u> The system must have dual (redundant) data links. If the main link fails, the secondary data link must take over automatically. Specification for the both link would be same. Specifications are:</p> <p>a. Data link frequency band: S/C band for primary link and UHF band for secondary link, or bidder may propose alternate suitable options.</p> <p>b. Type: Frequency Hopping Spread Spectrum (FHSS) or similar spread spectra type.</p> <p>c. Anti jamming capability: Direct Sequence Spectrum Spread or similar.</p>	

	<p>d. Bandwidth: As required for system Downlink: At least 8Mbps, must have sufficient bandwidth to downlink Full HD resolution color video at 30 fps, ISR real time images, real time SAR data, all sensor data in addition to normal control and communication data at maximum range of operation.</p> <p>e. Encryption type: AES 256 bit (encryption key is to be configurable by BAF).</p> <p>f. Transmit power: To be mentioned by bidder.</p> <p>g. Antenna type: Omni directional antenna for S/C band and Omni for UHF band or to be mentioned by bidder.</p> <p>h. Maximum range: At least 200 KM with full bandwidth.</p> <p>i. Power source: To be mentioned by bidder.</p> <p>j. Power consumption rate: To be mentioned by bidder.</p> <p>k. Interface type, both air and ground side: To be mentioned by bidder.</p> <p>l. Hacking or spoofing protection.</p> <p>m. The system should have provision to integrate satellite data link in future.</p>	
<p>44.</p>	<p>EO/IR/LRF Link:</p> <p>a. Should share the same data link.</p> <p>b. If different: To be mentioned by bidder</p> <p>(1) Frequency</p> <p>(2) Anti jamming</p> <p>(3) Transmission type.</p> <p>(4) Power requirement and source.</p> <p>(5) Transmit power.</p> <p>(6) Antenna type.</p> <p>(7) Range: Must be at least 200 KM.</p>	
<p>Payloads</p>		
<p>45.</p>	<p>Camera/ Surveillance equipment and IR with Laser Range Finder and Laser Designator:</p> <p>a. Manufacturer and Model: To be mentioned by bidder.</p> <p>b. Number of sensors: To be mentioned by bidder.</p> <p>b. Low light capability.</p> <p>c. Surveillance camera must provide Full HD video output at 30 fps.</p> <p>d. IR: Day and night capability at 0 lux.</p> <p>e. Pan / Tilt/ Zoom: 20~400 mm, continuous zoom, auto white balance or better.</p>	



	<p>f. Ground resolution: 0.1 m (@FOV=0.6deg, Altitude: 5000 m) or better.</p> <p>g. Picture element resolution: 0.25 m (Altitude: 5000 m, visibility: 15 km) or better.</p> <p>h. Maximum speed-height ration: $\geq 50^\circ/s$.</p> <p>i. Single photography area: 1 km x 1 km (@FOV=14deg, Altitude: 5000 m) or better.</p> <p>j. IR effective range for target: (target size - Human target).</p> <p>(1) Detection range: Min 8 km.</p> <p>(2) Identification range: Min 5 km.</p> <p>k. Visible light camera effective range for target (target size - Human target).</p> <p>(1) Detection range: Min 15 km.</p> <p>(2) Identification range: Min 10 km.</p> <p>(3) Measurement distance: Min 10 km.</p> <p>(4) Accuracy: 10 m or better.</p> <p>(5) Power consumption: To be mentioned by bidder.</p>																
	<p>SAR:</p> <p>a. Manufacturer and Model: To be mentioned by bidder.</p> <p>b. Continuous operation hour: 4 hours or more.</p> <p>c. Operation distance resolution bandwidth: as below or better:</p> <table border="1" data-bbox="537 645 766 1637"> <thead> <tr> <th>SAR Mode</th> <th>Range</th> <th>Resolution</th> <th>Image width</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Strip</td> <td>20km</td> <td>3m×3m</td> <td>6-8km</td> </tr> <tr> <td>20km</td> <td>1m×1m</td> <td>2km</td> </tr> <tr> <td>Spot</td> <td>10km</td> <td>0.5m×0.5m</td> <td>500m×500m</td> </tr> </tbody> </table> <p>d. GMTI: Must be able in clutter, minimum detectable velocity 20 kph, flight speed 170 kph, minimum detectable velocity =20km/h.</p> <p>e. Frequency: Ku or suitable band.</p> <p>f. Output power: To be mentioned by bidder.</p> <p>g. Power source and consumption rate: To be mentioned by bidder.</p>	SAR Mode	Range	Resolution	Image width	Strip	20km	3m×3m	6-8km	20km	1m×1m	2km	Spot	10km	0.5m×0.5m	500m×500m	
SAR Mode	Range	Resolution	Image width														
Strip	20km	3m×3m	6-8km														
	20km	1m×1m	2km														
Spot	10km	0.5m×0.5m	500m×500m														
47.	<p>Transponder:</p>																



	<ul style="list-style-type: none"> a. Manufacturer and Model no: To be mentioned by bidder. b. ID/Squawk facility. c. Visible to TCAS: Preferable. d. Mode A and Mode C: Must be capable. e. Military mode: Preferable. f. Power source and consumption rate: To be mentioned by bidder. 	
48.	<p><u>Armament capability:</u> Following provisioning is mandatory:</p> <ul style="list-style-type: none"> a. Integrated with laser range finder and laser designator. b. Hard point: 2/4 c. Supported armament type: Air to ground missile and precision guided bomb. d. Training missile. 	
49.	<p><u>EW pods:</u></p> <ul style="list-style-type: none"> a. Supported pods: At least support ELINT, RWR and chaff/flares dispenser (the provisioning is mandatory). Other pods are mentioned in optional requirement. b. <u>ELINT:</u> <ul style="list-style-type: none"> (1) Frequency range: 1 GHz to 18 GHz or better. (2) Coverage: At least $\pm 45^\circ$ horizontal and -30° to 0° elevation. (3) Receiver sensitivity: -70 dBm or better. (4) DF accuracy: 2° or better. c. <u>RWR.</u> <ul style="list-style-type: none"> (1) Warning frequency: 2 GHz to 18 GHz. (2) Coverage: 360° horizontal and 0° to $\pm 40^\circ$ elevation or better. (3) Needs to be integrated with Chaffs/flares dispenser. Received radar frequency needs to be visible in GCS. d. Chaffs and Flares (to be mentioned by bidder). 	
GROUND CONTROL STATION (GCS)		
50.	<p><u>Type (Mobile).</u> All software used in the system, including in the aircraft, must have perpetual license. That means all the software licenses must never expire. Bidder will have to provide all bug fixes, patches, updates throughout the entire service life of the system at free of cost.</p>	

	<p>Capabilities:</p> <ul style="list-style-type: none"> a. Launch: flight control console. b. Flight control: flight control console. c. Recovery: flight control console. d. Real time telemetry: data link monitoring console. e. Should be able to receive, display and exploit data from all payloads. The data link can transmit the data of EO/IR payload and SAR simultaneously. f. Emergency action plan in case of failure of any system: emergency homing if data link failed and other emergency handling procedures. g. Recording capability: Ability to store data for at least 30 days. h. Should have capability to Receive, display and exploit data from payload. j. Warning system for any type of unsafe op or parameter set or failure. k. Mission plan: <ul style="list-style-type: none"> (1) Generate and upload by wire or wireless: wireless and real time. (2) Validate mission plan (warning if anything beyond limit): capable. (3) Dynamic mission plan (change in flight): upload in real time. (4) Geo fencing: capable. l. GCS should be able to uplink data to Command Headquarters, if suitable link is provided by BAF. Bidder is to include all necessary hardware and software (including license). m. The GCS must be able to communicate with ATC tower and radar station through suitable VHF RT. 	
52.	<p>Control System:</p> <ul style="list-style-type: none"> a. Standard Control stick b. Throttle 	
53.	<p>Operating system:</p> <ul style="list-style-type: none"> a. Name: To be mentioned by bidder. b. Version: To be mentioned by bidder. c. Future upgradeable: Yes 	
54.	<p>Software type:</p> <ul style="list-style-type: none"> a. Configurable: capable b. Open source: no c. Source code to be provided 	



	d. Future upgradeable: capable	
	<u>Simultaneous Operation:</u>	
55.	a. One UAV at a time, two will be preferable. b. Should be capable to Hand over to next ground station in case of cascaded ground stations.	
	<u>Vehicle:</u>	
56.	a. Vehicle type: To be mentioned by bidder (Right hand drive preferable). b. Model and manufacturer: To be mentioned by bidder. c. Chassis type: To be mentioned by bidder. d. Engine, Type model and manufacturer: To be mentioned by bidder. e. Must have Air condition run by independent power source (not by vehicle eng) will be added advantage	
	<u>Repair maintenance facility on board:</u>	
57.	a. Should be equipped with necessary tools for upto second line maintenance. b. Should be equipped with necessary Problem analyzing hardware/software.	
	<u>Power for the full ground station:</u>	
58.	a. Source: Must have Generator, should have provision for external AC source (220 V AC). b. Consumption rate: To be mentioned by bidder. c. Redundancy: Redundancy for the generator preferable. d. Earthing and grounding: capable.	
59.	<u>Maximum operation hour:</u> >30hrs	



60.	<p>Safety and security:</p> <ul style="list-style-type: none"> a. EW protection specially protection against homing missile: Radar Warning Receiver and Self Protect jamming pods. b. Anti jam and anti spoofing capability: Direct Sequence Spectrum Spreader better (to be mentioned by bidder). 	
<p>Other Maintenance and Structural Factors</p>		
61.	<p>Airframe Geometry. The UAV is to be of such structure and design with essential features which will withstand its maximum speed. The airframe should be stable in nature. The airframe should offer additional gliding 'Performances in case of recovery from engine failure. It would also be of such design that it can fly with longer endurance with minimal fuel cost. The UAV is to have tri-cycle type under carriage assemblies which may be retractable or non-retractable. The structure may be built of metal alloy/carbon fiber/composite. The airframe design should be such that it contributes minimum RCS and IR signature. All the essential flight control systems are required to be available such as primary control surfaces for safe handling and better control of UAV.</p>	
62.	<p>Environmental condition (Essential). Due to hot and humid environment in Bangladesh, all the equipment including payloads and compartment should preferably be weather proof/sealed:</p> <ul style="list-style-type: none"> a. Temperature Operation: <ul style="list-style-type: none"> -20°c ~ +50°c (Airborne equipment) 0°c ~ +55°c (External equipment) 0°c ~ +50°c (Ground equipment) b. Humidity: 95% and above. c. Precipitation: To be mentioned by bidder. d. Dust: To be mentioned by bidder. e. Must be capable for sustained high temperature and humid costal/ maritime operation. 	
63.	<p>Structural Strength and Life. The UAV is to meet the following requirements:</p> <ul style="list-style-type: none"> a. The airframe should have sufficient strength to withstand stress of take- off, landing and required in flight maneuverability with maximum payload. b. The ops life is not to be less than 6000 hrs and 1200 landings. c. The UAV engine, all its equipment/component/accessories must be new and manufactured not earlier than November 2017. 	

	<ul style="list-style-type: none"> d. Calendar life of the UAV is not to be less than 15 years. e. Time before overhaul (TBO) should not be less than 2000 hrs/5 yrs. 	
64.	<p>Reliability and Maintainability:</p> <ul style="list-style-type: none"> a. Failures per 1000 hours: To be mentioned by bidder. b. Maintainability: Average direct maintenance requirement not greater than 10 MMH for each failure. 	
65.	<p>Survivability and vulnerability:</p> <ul style="list-style-type: none"> a. Small visual silhouette. b. Small IR signature. c. Small RCS: To be mentioned by bidder. d. Less electronic emission: To be mentioned by bidder. e. Less acoustic emission: To be mentioned by bidder. 	
66.	<p>Interchangeability and Modularity:</p> <ul style="list-style-type: none"> a. Same part no of same manufactures must match. b. Modularity: the airborne equipment, payload and armaments are module and easy to remove and install. 	
67.	<p>Publications:</p> <ul style="list-style-type: none"> a. Operation Manual: Aircraft Flight Manual. b. Maintenance Manual: Aircraft Maintenance Manual. c. Troubleshooting Manual: Fault Isolation Manual. d. Parts Catalog: Illustrated Part Catalog. e. Bulletin: Service Bulletin. 	
LOGISTIC SUPPORT		
68.	<p>Support Considerations. Uninterrupted logistic support is essential for full operation life of the aircraft. The logistic objectives are to make best use of the existing logistic support resources as long as the aircraft remains in service. BAF should acquire various information regarding logistic support from the manufacturer so as to find out the best use of the system. The following are required:</p>	



- a. Information. For official use, the manufacturer are to make available to BAF all development and production information including basic material data, software and licensed product, of every item in the main equipment and in its supporting equipment.
- b. Repair/Overhaul. The supplier is to provide the list of authorized overhauling/repair organizations for repair or overhaul of aircraft, engine and its component.
- c. Spares and Equipment. The expected service life of the aircraft is 15 years or more. It is essential that the manufacturer gives guarantee of providing aircraft, engine and various components required by BAF, either produced by them or by any third party organization, throughout the aircraft service life. The initial provisioning list, illustrated parts catalogue and price catalogue are also essential for smooth logistic support for uninterrupted air operation. **The bidder is to provide the critical backup spares which will be required for uninterrupted operation of the system for 02 (two) years after warranty period.** Turn-around time for warranty repair/replacement should not exceed 30 days. The bidder is to replenish within the expiry of warranty period if any of the critical backup spares are required or consumed from BAF inventory during warranty period.
- d. Consumable Items. A full range of consumable items including POL is to be made available at the user base at least one month before the UAV is inducted in the service. The list of items along with their consumption rate per 100 hour flying to be provided by the bidder.
- e. Publications. Operational and technical publications, parts catalogue etc are required by BAF before the aircraft is inducted for logistic support system. The price list of entire range of equipment/components is required before the final contract. The manufacturer is to inform BAF, any up-gradation of the items, changes of components used in the aircraft in the shortest possible time. In this regard BAF is required to know the exact system that is followed by the manufacturer through the automatic publication distribution. The manufacturer is to provide 2 x set of each publication in English version in both hard and soft copies. Delivery of technical Order/ Bulletin etc are to be provided free of cost during the entire life cycle of aircraft.
- f. Support Cost. Support cost generated within the life cycle of the UAV system/equipment/weapon systems are to be demonstrated. These cost are to include operating energy costs and the system is to be shown to be energy efficient.
- g. Transportability. The aircraft equipment, including appropriate packaging is to be transportable

by land, sea or air. The packages are to be small and as light as possible and must be capable of being dealt with expeditiously by handling equipment likely to be available at the dispatching and receiving airfields. The packages must be capable of movement on airfields, roads and tracks. It is essential that the packaging is such that the equipment can be unpacked easily and quickly in order not to delay aircraft generation and turn-around times.

ASSOCIATED TRAINING AND EQUIPMENT

69. **UAV Pilot Training.** The manufacturer is required to arrange training for 05 BAF Pilots (1 x Team Leader + 4 x Pilot) for eight (08) weeks before the shipment of the UAV to Bangladesh. The training is required to be exhaustive and should include both theoretical classes and actual operation of the Aerial Vehicle from Ground Control Station (GCS). Additionally, simulator flying (if available) should also be included.

Technical Officers and Ground Crew Training. The manufacturer should arrange training of 04 x BAF technical officers and 11 x technicians for eight (08) weeks before shipment of the aircraft to Bangladesh. So that, they can accomplish pre-flight, post-flight and thru flight inspections of the UAVs in Bangladesh. They are also to be trained to carry out rectification/servicing up to 2nd line maintenance and be able to operate, repair and rectify testers and test equipment to be used during periodic maintenance. In this regard, the manufacturer is to arrange training to BAF Technical team of 1st line and 2nd line maintenance. 1st line and 2nd line maintenance training may be arranged in the factory.

Note:

- 70.
- i. The bidder is to mention detailed breakdown of the training with syllabus, including the schedule and place of training. The medium of training should be in English language.
 - ii. BAF will have the option to accept/reject/modify/discard all or part of the training schedule/syllabus.
 - iii. The bidder is to provide a detail plan of conducting training highlighting the subject wise (based on equipment basis) period requirement, no of hours including theoretical and practical training as per the group. The bidder is to prepare detail syllabus and submit with the offer.
 - iv. The training manuals are to be prepared in English and forwarded to BAF for approval at least 30 days prior to start training.

	<p>v. The bidder is to plan and conduct the training program with UAV in operational condition where all the major components will be available.</p> <p>vi. The bidder is to arrange visiting manufacturer area of all major components during conducting training.</p>	
71.	<p>Training Cost. All relevant costs for training (total 20 x personnel) are to be quoted separately by the bidder on the following heads:</p> <p>(a) Pilots/Operators Training. Break down of training cost for single person and as a group with indication of the total number of trainees in the group along with number of days.</p> <p>(b) Technical Training. The cost of technical training for 01xperson, and as a group, for different category of technical personnel and for different level (1st, and 2nd level) of maintenance training to be mentioned in details.</p> <p>(c) Accommodation, Food and Transportation. BAF will provide both way air tickets for the trainees up to the manufacturer's premises/training institute. The bidder is to provide suitable accommodation (single room for the officers and a twin room for airmen in minimum three star standard hotel), food, internal all types of transportation and medical facilities. The bidder is to quote the price for accommodation and food separately.</p> <p>Associated Equipment. The following equipment associated with this requirement is needed:</p>	
72.	<p>a. Testers/Test equipment and tools for operation and 1st and 2nd line maintenance of all systems of the aircraft.</p> <p>b. Special type ground handling equipment/tools required for all the systems for operation and 1st and 2nd line maintenance.</p> <p>c. Backup spares and periodic replacement required for two (02) yrs for uninterrupted operations.</p>	



Tender Clause No	<p style="text-align: center;"><u>OPERATIONAL AND TECHNICAL SPECIFICATION</u> <u>OPTIONAL REQUIREMENT</u></p>	Bidder's Response
73.	<p><u>COMMENT:</u></p> <p>a. Reconnaissance Range: 30 MHz -2700 MHz or better. b. DF Frequency: 100 MHz -2700 MHz or better.</p>	
74.	<p><u>Communication Jammer.</u></p> <p>a. Communication Jammer with the range of 20km, type and specification to be mentioned by bidder.</p> <p><u>Optional payload:</u></p> <p>a. Communication Relay System: To be mentioned by bidder. b. ELT (Emergency Locator Beacon): To be mentioned by bidder. c. Live Missile System including necessary tester and test equipment. Missile type and specification are to be mentioned by bidder. d. Compatible guided bomb: Type and specification are to be mentioned by bidder. e. Practice missile and practice guided bomb: Type and specification are to be mentioned by bidder.</p> <p><u>Control System:</u></p> <p>a. Foot pedal type Rudder preferable. b. Force feedback preferable.</p> <p><u>Interface with outer world:</u></p> <p>a. C3 system: Ground Control Station. b. Receive process and transmit tactical info: capable.</p> <p><u>Maritime Capability:</u></p> <p>a. Capability to operate in maritime domain: To be mentioned by bidder. b. Additional requirement to control from ship/marine vessel: To be mentioned by the bidder.</p>	
79.	<p><u>List of Backup Spares for 05 Yrs Op.</u> The bidder is to submit with the offer the list of spares for the full system with prices needed for 5 years maintenance support after warranty period. BAF authority will decide about the procurement of these spares. This quote will not be considered for deciding the bidder's financial position.</p>	<p style="text-align: right;">✓</p>

80.	<p>Training and Maintenance Tools for 3rd Line Maintenance. Supplier is to arrange separate 08 x weeks training for 3rd line maintenance after completion of TST period at the manufacturer's premises. BAF will nominate 01 x Team Leader (GD(P) off), 02 x Engg Officers and 06 x Technicians out of 04 x Engg Officers and 11 x Technicians mentioned in paragraph 70. This training will include component level fault finding, rectification and total transfer of technology. Supplier is to provide detailed syllabus of the 3rd line maintenance training before 03 months of ending TST duration. Bidder is to quote separately for the cost of 3rd line maintenance training, price list of 3rd line repair & maintenance tools. BAF will have full authority to accept/reject/partially accept the proposal.</p>	
81.	<p>Stand By GCS. In addition to standard GCS, bidder is to quote for a 'stand by GCS'. The stand by GCS will be deployed in another base other than the main operating base. The stand by GCS should have bare minimum facilities to extend the range as well as control and land the aircraft other than the main operating base. Bidder is to include all necessary networking equipment (if required). Detail specification to be given by bidder.</p>	
82.	<p>On Site Project Development (OSPD) Team. A BAF team having experience on R&D related to UAV comprising of 01 x Pilot, 01 x Engg (M) and 01 x Engg (E) will stay at manufacturing site during the following stages of UAV manufacturing for effective technology transfer:</p> <ol style="list-style-type: none"> Major component production Assembling System Integration Functional Check and Calibration. 	
83.	<p>Modification and Growth Potential. There should be scope of future modification if deemed necessary. Easiness in improvement is a desirable criterion. The UAV system must facilitate upgrading to accommodate various sensor payloads. The growth potential should cover the following areas:</p> <ol style="list-style-type: none"> Extended payload range. Air Vehicle capability for spare weight, volume and power consumption. Air vehicle capability for spare interfaces with avionics system. Data link bandwidth capabilities. Ground system capability for operating future payloads. Computer resource reserved capabilities for memory, timing etc. 	
84.	<p>Price quoting for the optional items as mentioned in paragraph 73, 74, 75, 77, 79, 80, 81 and 82 is mandatory. BAF will have the option to accept/reject/modify/discard all or any of the above mentioned services/items.</p>	

GENERAL TERMS AND CONDITIONS

Tender Clause No		Bidder's Response
85.	<p>List of User Countries. The offered model of equipment must be used in minimum 03 foreign countries (outside the country of origin). A certificate needs to be provided in this regard.</p>	
86.	<p>Performance Evaluation of Offered UAV Before Shipment. As part of actual performance evaluation before shipment, the bidder is to arrange a performance evaluation flight including live weapon delivery of the UAV for BAF team in user/manufacturing country. All expenses of the test flight and test firing including cost of weapon and internal transportation of BAF personnel will be borne by the bidder. Air tickets, accommodation and meal of BAF team will be borne by BAF. The Bidder is to intimate BAF at least 45 days in advance about the visit schedule, location and duration.</p>	
87.	<p>Installation of Equipment at Selected BAF Location/Base. The equipment is to be installed by the bidder at the designated base of Bangladesh Air Force (BAF). The newly installed UAS has to be handed over to BAF in serviceable and operational condition. FCF, calibration of UAV & all necessary equipment has to be completed.</p>	
88.	<p>Stage Inspection Team (SIT). Once the contract is signed, two (02) x stage inspections will be carried out by BAF. The bidder is to specify tentative during of the assembling of the UAV and its major equipment. All expenses of the team will be borne by BAF. The bidder is to intimate at least 60 days in advance about the schedule of the SIT. Details as follows:</p> <ul style="list-style-type: none"> a. First SIT will be carried out after 40% to 50% assembly is completed. 05 x BAF members for 07 working days (excluding journey period) will carry out the SIT. b. Second SIT will be carried out after 70% to 75% assembly is completed. 05 x BAF members for 07 working days (excluding journey period) will carry out the SIT. 	<p style="text-align: right;">✓</p>

89.	<p>Pre-shipment Inspection (PSI). Before shipment of the consignment a pre-shipment inspection of the complete UAV and its associated items will be carried out by a nine (09) x member PSI team from BAF at the manufacturer's factory for the duration of 10 x working days (excluding journey period). The PSI team will depart Bangladesh as per schedule submitted by the Bidder. All expenses of the team will be borne by BAF. The Bidder is to intimate BAF at least 60 days in advance about the PSI schedule.</p>	
90.	<p>Shipment/ Delivery. The contracted UAV and its associated equipment/items are to be delivered to the BAF designated base within eighteen (18) months after signing the contract.</p> <p>Warranty/Guarantee. The bidder must ensure the following in their offer:</p>	
91.	<p>a. The bidder is to provide minimum 01 year warranty for trouble free operation of the entire UAV system including ancillary equipment from the date of acceptance of the system/equipment by BAF. The period of un-serviceability of the UAS up to 24 hours in aggregate will be deemed as normal but more than 24 hours will be deducted from the period of trial run and warranty period for the purpose of respective period calculation. The bidder is to provide a warranty certificate in this regard.</p> <p>b. Any item or equipment found unserviceable/defective during warranty period, the bidder is to replace/repair the same free of cost within 15 days from the date of reporting. If UAS remains U/S for the item, the time would not be calculated for counting warranty period and TST.</p> <p>c. During the whole warranty period, any un-serviceability of the UAS more than 48 (forty eight) hours will be added together and thus, if the period of un-serviceability exceeds 60 days then 5% of the LC value will be forfeited as a penalty.</p> <p>d. Both ways freight and insurance charges are to be borne by the bidder for the warranty replacement items.</p> <p>e. If the bidder fails to repair/replace an item/equipment under warranty claim within the stipulated period (30 days) then the warranty period would be extended by the number of days delayed in repair/replacing the items/equipment under warranty to make the total warranty period for 01x year.</p> <p>f. If any replaced equipment is found not as per design and not functioning as per operational requirement, the item is to be replaced by the supplier. No modification of the item will be accepted.</p>	

92.	<p>Detailed Work Plan. The supplier shall provide a detailed work plan for UAS manufacture, stage inspection, assembly, training, test flight, test firing, acceptance check and shipment/delivery of the system and other items/equipment. The work plan shall contain detailed information of preparation and activities to be accomplished by the supplier. The detailed work plan is to be delivered to BAF within 30 days of contract award.</p> <p>Installation and Commissioning.</p> <p>a. The bidder will send an installation team to Bangladesh for the assembly and installation of UAS. Necessary harness, fittings, diagram and any other necessities are to be provided by the bidder for installation. During installation, any damage, burnt-out or de-shaped part, equipment or spare should be replaced with a new one; no repaired or modified item will be accepted.</p> <p>b. After completion of installation of the UAS, the bidder shall carry out a detail test of all the equipment of the UAS in presence of BAF experts. Turn-around time for completion of installation will be maximum 30 days from the date of arrival of all equipment at installation base.</p> <p>c. After completion of installation and detail test, calibration of all the equipment of the UAS system, the Bidder will confirm the UAS readiness for Commissioning Test Flight. The bidder shall provide technical assistance as required to support initial Commissioning Test Flight of UAS. In coordination with BAF and appropriate technical personnel, Bidder shall make adjustments and calibration to the equipment, as required. It is estimated that this support will require ten (10) on-site workdays.</p> <p>d. All cost for installation team including food, internal transportation, medical care etc is to be borne by the bidder. However, accommodation, food in BAF Messes for required personnel may be provided on payment basis.</p>	
94.	<p>Functional Check Flight (FCF)/Operational Check. FCF/Operational check of UAV and its associated equipment will start after the satisfactory commissioning test flight and will be carried out by BAF experts and the bidder/representative. The Functional /Operational check will be carried out by each aerial platform with different configuration. Satisfactory flying hour for each aerial platform must not be less than 25 hours. The Calibration of the UAS may be carried out during the functional/operational check. During the Functional/ Operational check, all operational parameter mentioned in the contract will be checked. (Further detailed discussion may take place in pre-bid meeting).</p>	

95.	<p><u>Acceptance Check.</u> Acceptance will be carried out after the satisfactory FCF. During FCF, if the system is found unsatisfactory, acceptance will be held up till the same is corrected.</p>	
96.	<p><u>Technical Support Team (TST).</u> The bidder is to keep a TST (Technical Support Team) to repair/rectify any fault/un-serviceability of the UAS during warranty period. Minimum 02 x members TST is to be there in the team for entire warranty or with bidders own expense. The TST will rectify all problems encountered in the UAS equipment during that period and will provide "On site Practical Training" to the BAF technicians and operators for smooth technology transfer of the UAS. The TST will provide certificates to BAF technicians and operators in this regard. No extra cost would be considered for this. The number of TST members including interpreter (if any) and their duration of staying at BAF base along with the cost are to be mentioned separately in the offer. The bidder shall bear all related cost of air tickets, food, medical, accommodation and transportation etc for the members of TST and the interpreter (if any). BAF shall provide the local transportation for the team within BAF area. However, BAF may arrange accommodation & fooding at BAF facilities on payment by bidder.</p>	
97.	<p><u>Miscellaneous Terms & Conditions.</u> The following miscellaneous terms and conditions are to be followed:</p> <ol style="list-style-type: none"> a. The bidder must mention the name and full address of the local agent (if any) in the offer. b. Compliances/Non-compliances is to be mentioned against each tender clause. c. BAF/DGDP reserves the right to increase/decrease quantity of items and accept/reject any/all tender without assigning any reasons. d. The cost of UAS including all charges is to be 'Firm and Fixed'. e. Freight will be paid at actual, but not more than the contracted freight. f. Cost of freight and insurance for any surplus spares/modules/accessories, which will be taken back after completion of installation of UAS, is to be borne by the bidder. g. Delivery schedule mentioned in the tender specifications may be changed by DGDP/BAF due to delay in concluding the contract. Delivery period of the UAS will be 18 months after signing the contract. h. The bidder must mention the prices in USD (except for the local currency, items/services) unit wise which 	

	<p>is to be firm and fixed. No increase in price at any stage after submission of offer will be accepted by BAF.</p> <p>j. The bidder is to quote the freight charge by sea or air up to Chittagong/Dhaka, Bangladesh. The local transportation of UAS in Bangladesh (From the port of arrival to the designated BAF base) is to be arranged and paid by the bidder.</p> <p>k. The bidder is to mention the port /country of shipment.</p> <p>l. The transshipment is not allowed, but if the bidder needs transshipment then they are to mention it in their offer about their requirement. In case of such requirement transshipment will only be allowed under single AWB/BL.</p> <p>m. Part shipment is allowed but part payment is not allowed.</p>	
<p>98.</p>	<p>Payment Terms. 100% Payment (except payment in local currency) will be made through irrevocable LC opened with scheduled bank in Bangladesh and negotiating bank recommended by the bidder under following terms and conditions:</p> <p>a. 40% of the LC value (minus the cost of TST, installation of equipment and Trg) may be released on production of following documents:</p> <p>(1) Clearing/original Bill of lading/ Air way Bill issued by the carrier in 06 Copies (With one original). Freight amount must be shown in the Bill of lading /Air way Bill. Otherwise only FOB/ FCA value will be paid.</p> <p>(2) Bidders invoice 06 copies (with one original).</p> <p>(3) Packing list 06 copies (with one original).</p> <p>(4) Original certificate from Chamber of Commerce or certificate of authorization for exporting of military goods06 copies (with one original).</p> <p>(5) Manufacturers' Factory/bidders Inspection Report / certificate 06 copies (with one original).</p> <p>(6) Bidders Warranty/ Guarantee certificate06 copies (with one original).</p> <p>(7) Pre-shipment Inspection certificate signed by the BAF member of PSI Team06 copies (with one original).</p>	

	<p>b. 40% of the LC value (minus the cost of TST, installation of equipment and Trg) may be released on satisfactory acceptance of all the items in serviceable condition and after completion of installation, calibration and Functional Check Flight (FCF) of the UAS at BAF Site and submission of CRV.</p> <p>c. 20% of the LC value (minus the cost of TST, installation of equipment and Trg) may be released after the expiry of the warranty period.</p> <p>d. 100% cost of training may be released after satisfactory completion of training as per the contract.</p> <p>e. 100% cost of TST may be released after satisfactory completion of TST service as per the contract.</p> <p>f. 100% cost of installation will be released on completion of installation job and after getting installation completion certificate from user/BAF.</p>	
99.	<p>Advance Payment Option. This option will be applicable for lowest bidder only. In case of 30% advance payment, bidder may quote the discounted price separately.</p>	
100.	<p>Replacement Assurance. Supplier is to replace unused items of 02 years critical back up spares, if found not used during 02 years operation after warranty with the spares which is consumed during this period and likely to be required in future also.</p>	
101.	<p>Vendors List. Full address of the vendors including FAX number and e-mail address are to be provided for all vendor items, used in UAS.</p>	
	<p>Financial Offer</p>	
102.	<p>All costs are to be mentioned in US dollars (USD) in FOB basis.</p>	
	<p>Quoting price of the followings is essential:</p> <p>a. Cost of UAS which included 03 x areal platforms, GCS and all necessary equipment at BAF side which is required to meet the essential operational parameters mentioned in this tender specification. Cost of all essential payloads is to be mentioned individually. In addition, the bidder has to quote for per additional areal platform.</p>	<p style="text-align: right;">✓</p>

	<p>b. Price of total Training package as mentioned in essential requirements at paragraph 69, 70 including breakdown mentioned in paragraph 71 (a-c).</p> <p>c. Cost of testers, main tools, back up spares mentioned in 72 (a-c).</p> <p>d. Cost of all Optional Requirements mentioned in paragraph 73, 74, 75, 77, 79, 80, 81 and 82. Cost of all optional payloads is to be mentioned individually.</p> <p>e. Cost of shipment by Sea/Air as mentioned in paragraph 90.</p> <p>f. Cost of Technical Support Team (TST) as mentioned in paragraph 96.</p> <p>Note: BAF will reserve the right to accept or reject any items/tools/accessories/tester and ground equipment from the offer. In addition, BAF will also reserve the right to ask the bidder to supply any provisioning/equipment whose price are asked to quote in the financial offer.</p>	
104.	<p>Factor for Determining the Lowest Bidder.</p> <p>The bidder must comply with all essential and optional requirements to be eligible for lowest bidder. The bidder shall quote the price of the items as mentioned below, which will be considered for determining the lowest bidder:</p> <p>a. Price of UAS and all other associated equipment/items including installation at BAF base/site which is required to meet the essential operational characteristics mentioned in this tender specification.</p> <p>b. Price of total Training package as mentioned in essential requirements including breakdown in paragraph 71 (a-c).</p> <p>c. Cost of testers, main tools, back up spares mentioned in 72 (a-c).</p> <p>d. Cost of shipment by Sea/Air as mentioned in paragraph 90.</p> <p>e. Cost of Technical Support Team (TST) as mentioned in paragraph 96.</p> <p>f. Discounted price in case of advance payment option mentioned in paragraph 99 will not be considered for determining the lowest bidder.</p>	



105.	Offer must remain valid for minimum 180 days from the date of tender opening. Within the validity of the offer, withdrawal of offer or unwillingness to sign the contract by the bidder is not accepted and in such cases action would be taken against the principal bidder and local agent as per DGGP's rules.	
106.	BAF/DGGDP has all the rights to select any bidder or cancel the whole tender process at any time without assigning any reason.	

