Appendix 'B'
(Refer Para 19 of EoI)

COMMERCIAL EVALUATION CRITERIA

Commercial Evaluation Criteria

1. **Name of the Vendor**.

2. **Evaluation Criteria**.

Ser No	Criteria	Vendor Submission	Remarks (if Any)
(a)	Nature of the Company (refer Para 6 (b) of Chapter-III of DAP-2020)	Indian / Joint Venture	Supporting documents to be attached
(b)	Ownership status (refer Para 6 (b) of Chapter-III of DAP-2020)	Compliant / Non compliant	
(c)	Category of Industry	Large / Medium / Small / Micro / DPSU/ Start Up	
(d)	Registration Details (MSMEs to provide UDYAM certificate, Start Up Companies to provide DIPP License, others to provide Registration Certificate as applicable).	Yes / No	
(e)	**Minimum average turnover for last three financial years from date of issue of EoI**. Minimum Average Annual Turnover for last 03 financial years, ending 31st March of the previous financial year.	To be provided.	Supporting documents to be attached
(f)	Net worth of previous financial year ending 31 Mar 2021.	Positive / Negative	
(g)	Defence Industrial License details.	Yes/ Applied for/ Being Applied for	

Date :

Note :

1. All submissions must be on printed copy of Appendix as uploaded on MoD website and should be supported by referenced documents duly authenticated.

2. Any input with incorrect or missing reference will not assessed.

DTE GEN ARMD CORPS IHQ of MoD (Army) Armoured Corps-3

Appendix 'C'
(Refer Para 20 of EoI)

TECHNICAL EVALUATION CRITERIA

Ser No	Criteria and Sub Criteria	Vendor Response	Remarks (if Any)
1.	Indigenous content will be minimum 50% for Prototype	Compliant/ Non Compliant	
2.	Indigenous content will be minimum 50% during procurement stage as per DAP-2020	Compliant/ Non Compliant	
3.	Indigenous design as per provision of DAP-2020	Compliant/ Non Compliant	
4.	**Timelines**		
	(a) Development of prototype 48 weeks.	Compliant/ Non Compliant	
	(b) Delivery of items as per delivery schedule – 24 months	Compliant/ Non Compliant	
5.	Confirmation of capability to develop and provide equipment to meet user requirements specified in **Appendix 'A'** (PSQR).	Compliant/ Non Compliant	
6.	Proposed system configuration (broad design details).	Provided/ Not Provided	
7.	**Experience**. Min 01 year, experience in broad areas like manufacturing / electronics/ explosive etc, as applicable in the instant case. If not, then cumulative experience of at least 02 years in above areas, resulting in gaining of competence for manufacturing the proposed product (Details of Existing manufacture related infrastructure/R&D/Quality control facilities to be provided).	Compliant/ Non Compliant	Certificate for the same to be provided
8.	Acceptance to all terms and conditions given in the EoI.	Compliant/ Non Compliant	

Ser No	Criteria and Sub Criteria	Vendor Response	Remarks (if Any)
PSQR Requirements			
9.	**Weight**. All Up Weight with payloads should not exceed 50 kgs.	Compliant/ Non Compliant	
10.	**Size**. The size of AV in launch condition should not exceed 3.5 mtr x 2.5 mtr.	Compliant/ Non Compliant	
11.	**Launch Altitude**. The Swarm drones must be capable of being launched from altitudes upto 4500 mtr AMSL.	Compliant/ Non Compliant	
12.	**Operating Altitude**. The drones should be capable of operating at altitudes of not less than 1000 mtr Above Ground Level.	Compliant/ Non Compliant	
13.	**Operating Temperature**. The swarm drone system should be able to operate under following temperatures:- (a) Maximum - As actually obtained in locations where proposed to be employed. (b) Minimum - Between minus 20^0C and minus 10^0C.	Compliant/ Non Compliant	
14.	**Operating Range**. The operating range of the drones with Aerial Data Relay (ADR) should be minimum 30 krn (one way distance).	Compliant/ Non Compliant	
15.	**Endurance**. Drones should have an endurance of minimum two hours.	Compliant/ Non Compliant	
16.	**Launch and Retrieval**. Vertical Take Off and Landing (VTOL) from unprepared area, tube/canister launched and retrieval mechanism should be VTOL/ parachute.	Compliant/ Non Compliant	
17.	**Operating Capability Under Difficult Climatic/ Weather Conditions**. Swarm drones should be capable of operating in light rains and should be able to take off and land in head wind speeds of not less than 35 km per hour.	Compliant/ Non Compliant	

Ser No	Criteria and Sub Criteria	Vendor Response	Remarks (if Any)
18.	**Flight Modes**. The drone should be able to operate in the following flight modes :-		
	(a) **Fully Autonomous Mode**. Follow a pre-programmed flight path. Dynamic re-programming of the flight path must be possible.	Compliant/Non Compliant	
	(b) **Semi-Autonomous Mode**. Control of heading, air speed and altitude of the AV by the operator with other parameters being controlled by the autopilot.	Compliant/Non Compliant	
	(c) **Loiter Mode**. Fly around a fixed point.	Compliant/Non Compliant	
	(d) **Target Seeking Mode**. Keep camera locked on to a fixed / moving target.	Compliant/Non Compliant	
	(e) **Camera Guide Mode**. Follow a locked on moving target.	Compliant/Non Compliant	
	(f) **Manual Mode**. For the pilot to physically control the AV for manoeuvring (incase of autopilot failure or manual override).	Compliant/Non Compliant	
	(g) **Return Home Mode**. In case during the flight there is break in communication (duration should be programmable by the user), the AV should automatically change to 'Return Home' mode.	Compliant/Non Compliant	
19.	**Swarming and Collaborative Autonomy**. The drones should exhibit autonomous swarm capabilities like **collision avoidance**, **flocking**, **schooling**, **foraging**, **automatic path planning and self healing**.	Compliant/ Non Compliant	
20.	**Modes of Operation**. The swarm drones should be able to operate in three modes as under :-		
	(a) **Single Region of Interest Mode**. In this mode, the operator should be able to provide a mission to the swarm that will automatically be distributed amongst the drones.	Compliant/ Non Compliant	

Ser No	Criteria and Sub Criteria	Vendor Response	Remarks (if Any)
	(b) **Multi Region of Interest Mode**. In this mode, the swarm will be given multiple missions. Swarm will split into multiple smaller swarms to achieve each mission.	Compliant/ Non Compliant	
	(c) **Dynamic Mission Mode**. In this mode, the operator should be able to dynamically provide a new mission to the swarm. After receiving the new mission, the drones should redistribute the mission tasks amongst themselves for ISR or targeting.	Compliant/ Non Compliant	
21.	**Manned Unmanned Teaming (MUM-T) Capability**. The system should be capable of detaching smaller swarms of upto 20 drones to be controlled with Remote Video Terminal (RVT) upto a distance of five km on being authorised by the GCS. RVT should be able to undertake the following functions:- (a) Select an area on the RVT for surveillance by drones. (b) Specify the number of drones required for mission. (c) Release of explosive payloads.	Compliant/ Non Compliant	
22.	**Correction of Fall of Shot**. The drones carrying High Performance EO/ IR sensors should be capable of calculating the distance of fall of shot from the target and transmit the correction to GCS and RVTs.	Compliant/ Non Compliant	
Technical Parameters			
23.	**Payloads**. The requisite details are as under :-		
	(a) **High Performance Colour Day Video Camera**. High Performance Colour Day Video Camera will have a **Colour Day Video Camera** of following specifications :-		
	(i) **Resolution**. Provide real time video of minimum 2688 x 1520 pixels resolution at not less than 25 frames per second.	Compliant/ Non Compliant	

Ser No	Criteria and Sub Criteria	Vendor Response	Remarks (if Any)
	(ii) **Zoom**. Not less than 30 x optical zoom.	Compliant/ Non Compliant	
	(iii) 2 axis gimbal based stabilisation.	Compliant/ Non Compliant	
	(iv) **WFOV**. Not less than 60^0.	Compliant/ Non Compliant	
	(v) **Pan**. 360^0(continuous).	Compliant/ Non Compliant	
	(vi) **Tilt**. $\pm 60^0$ from the vertical.	Compliant/ Non Compliant	
24.	(a) **Ranges**. Slant ranges in clear weather should be as under :- **A Vehicle** / **B Vehicle** / **Human Targets** **Detection** 5000 mtr / 4000 mtr / 2000 mtr **Recognition** 2500 mtr / 2000 mtr / 1000 mtr	Compliant/ Non Compliant	
	(b) Capable of taking still images.		
	(c) Store minimum 180 minutes output on board the AV at minimum 2688 x 1520 pixels resolution at 25 frames per second along with telemetry data.	Compliant/ Non Compliant	
	(d) The LRF should be capable of measuring ranges upto 5000 mtrs.	Compliant/ Non Compliant	
	(e) **Automatic Target Recognition**. The Artificial Intelligence enabled automatic target recognition ranges should not be less than 400 mtr for an Armoured Fighting Vehicle.	Compliant/ Non Compliant	
25.	**Standard Colour Day Video Camera**. Standard Colour Day Video Camera will have a **Colour Day Video Camera** of following specifications :-		
	(a) **Resolution**. Provide real time video of minimum 1280 x 720 pixels resolution at not less than 20 frames per second.	Compliant/ Non Compliant	
	(b) **Zoom**. Not less than 10 X optical zoom	Compliant/ Non Compliant	

Ser No	Criteria and Sub Criteria	Vendor Response	Remarks (if Any)
	(c) 2 axis gimbal based stabilisation.	Compliant/ Non Compliant	
	(d) **WFOV**. Not less than 60^0.	Compliant/ Non Compliant	
	(e) **Pan**. 360^0 (continuous)	Compliant/ Non Compliant	
	(f) **Tilt**. $\pm 60^0$ from the vertical.	Compliant/ Non Compliant	
	(g) **Ranges**. Slant ranges in clear weather :- **A Vehicle** / **B Vehicle** / **Human Targets** **Detection** 2500 mtr / 2000 mtr / 1250 mtr **Recognition** 1500 mtr / 1000 mtr / 750 mtr	Compliant/ Non Compliant	
	(h) Store minimum 180 minutes output on board the AV at minimum 1280 x 720 pixels resolution at 20 frames per second alongwith telemetry data.	Compliant/ Non Compliant	
	(j) **Automatic Target Recognition**. The Artificial Intelligence enabled automatic target recognition ranges should not be less than 400 mtr for an Armoured Fighting Vehicle.	Compliant/ Non Compliant	
26.	**Monochromatic Night Thermal Camera**. Monochromatic Night Thermal Camera with following specifications will be provided :-		
	(a) **Resolution**. Provide real time video of minimum 640 x 480 pixels resolution at not less than 20 frames per second.	Compliant/ Non Compliant	
	(b) **Field of View**. Not less than 15^0.	Compliant/ Non Compliant	
	(c) **Pan**. 360^0.	Compliant/ Non Compliant	
	(d) **Tilt**. $\pm 60^0$ from the vertical.	Compliant/ Non Compliant	

Ser No	Criteria and Sub Criteria	Vendor Response	Remarks (if Any)
	(e) **Ranges**. Slant ranges in clear weather:- **A Vehicle** / **B Vehicle** / **Human Targets** **Detection** 1500 mtr / 1200 mtr / 700 mtr **Recognition** 800 mtr / 600 mtr / 500 mtr	Compliant/ Non Compliant	
	(f) **Automatic Target Recognition**. The Artificial Intelligence enabled automatic target recognition ranges should not be less than 200 mtr for an Armoured Fighting Vehicle.	Compliant/ Non Compliant	
27.	**Explosive Payloads**. Explosive payloads will be user configurable and following payloads will be provided :-		
	(a) **Anti Personnel**. CEP of 3 kg and 5 kg (HE Fragmentation) ammunition should be five mtr or less with drop height of 500-600 mtr. The kill radius for the anti -personnel explosive payloads should be as under :-	Compliant/ Non Compliant	
	(i) 3 kg HE Fragmentation ammunition - Not less than 15 mtr.	Compliant/ Non Compliant	
	(ii) 5 kg HE Fragmentation ammunition - Not less than 25 mtr.	Compliant/ Non Compliant	
	(b) **Shaped Charge Top Attack Ammunition**. Shaped charge top attack ammunition should be capable of penetrating RHA plate of not less than 100 mm thickness with CEP of 1.5 mtr or better.	Compliant/ Non Compliant	
	(c) All munitions should have inbuilt safe arming mechanism.	Compliant/ Non Compliant	
28.	**GCS**. GCS should be a modular and portable with ruggedized laptops/ screens and compatible with DSM maps. Details are as under :-		

Ser No	Criteria and Sub Criteria	Vendor Response	Remarks (if Any)
	(a) **Pre - Flight Checks**. Software should have the capability to perform pre-flight checks of the complete system before every flight for confirming the flight worthiness. As per the checks, GO or NO GO in the drone operation should be indicated.	Compliant/ Non Compliant	
	(b) **User Controls**. The GCS should provide following controls to the user :-		
	(i) Take off/Land without any manual assistance.	Compliant/ Non Compliant	
	(ii) Set altitude of the drones.	Compliant/ Non Compliant	
	(iii) Way point navigation.	Compliant/ Non Compliant	
	(iv) RPV Mode which allows drones to be flown in semi-autonomous/manual mode.	Compliant/ Non Compliant	
	(v) Release of explosive payloads.	Compliant/ Non Compliant	
	(c) **Display**. The GCS should display the following:-		
	(i) Geographic map along with Aerial Vehicle (AV) location, AV trajectory, waypoints and flight plan.	Compliant/ Non Compliant	
	(ii) Real-time AV parameters should be displayed at all times during the flight, such as velocity, position and flight mode.	Compliant/ Non Compliant	
	(iii) Display live video and a synchronised moving map in real time.	Compliant/ Non Compliant	
	(iv) RAM, processor and display of suitable specifications should be provided.	Compliant/ Non Compliant	
	(v) Record and replay optical sensor output, a Solid State Disk (SSD) of minimum 4 TB must be provided.	Compliant/ Non Compliant	

Ser No	Criteria and Sub Criteria	Vendor Response	Remarks (if Any)
	(vi) Cater for minimum 180 minutes of continuous operation.	Compliant/ Non Compliant	
	(vii) GCS should be ruggedized to conform to MIL STD 810 G.	Compliant/ Non Compliant	
29.	**Ground Data Terminal (GDT)**. High power airborne data links to transmit commands from GCS to AVs and from AVs to GCS be provided with following specifications:-		
	(a) **Op Frequency**. Military band frequency when allotted will be utilised for the system. It should have a suitable uplink and downlink with the GCS in S/C Band (2GHz to 6 GHz) secured with 256 bit AES encryption or higher standards. The transmission must be digital. It should be scalable to alternate frequency as per Indian Army requirement at a subsequent stage.	Compliant/ Non Compliant	
	(b) **Inter Drone Communication Link**. Each drone should be equipped with inter drone telemetry to share relevant drone parameters with 256 AES encryption.	Compliant/ Non Compliant	
	(c) The system should be able to function in a GPS degraded/denied environment.	Compliant/ Non Compliant	
	(d) Anti jamming and anti spoofing measures be incorporated in both system hardware and software.	Compliant/ Non Compliant	
	(e) The system should be compatible with GPS, GLONOSS and IRNSS.	Compliant/ Non Compliant	
30.	**Map**. A moving map to be provided in a resizable window with following facilities :-		
	(a) Map to be synchronised both in position and scale to the video as per specified zoom.	Compliant/ Non Compliant	
	(b) There should be facilities to :-		
	(i) Annotate the map.	Compliant/ Non Compliant	

Ser No	Criteria and Sub Criteria	Vendor Response	Remarks (if Any)
	(ii) Allow free movement (dragging) of the map, centre the map on the camera's ground track, centre the map on a specific area, see the map from the camera's point of view, fix the map so that it does not change with the movement of the drones and re-synchronise the map to the drones, as desired.	Compliant/ Non Compliant	
	(iii) Allow selection of way points and flight path.	Compliant/ Non Compliant	
	(iv) Measure distance between ground points.	Compliant/ Non Compliant	
	(v) Enlarge and reduce the map (zoom in / out).	Compliant/ Non Compliant	
Maintainability & Ergonomic Parameters			
31.	The Autonomous Surveillance and Armed Drone Swarm for High Altitude Area should have the following operational and maintainability characteristics :-		
	(a) It should conform to JSS-55555 2012 Revision 3 standards (as applicable to the equipment).	Compliant/ Non Compliant	
	(b) It should conform to Opto electronic equipment (Day and Night Camera) compliant to JSS-5855-11-2019.	Compliant/ Non Compliant	
	(c) It should conform to software been verified and validated as per IEEE-12207.	Compliant/ Non Compliant	
	(d) It should conform to applicable EMI/ EMC tests as specified in MIL Standards 461F.	Compliant/ Non Compliant	
	(e) Storage of explosive payload should confirm to ammunition storage regulations stipulated as per STEC guidelines.	Compliant/ Non Compliant	
	(f) **Service Life**. The service life should not be less than 500 landings for Drones, not less than 07 years for IT equipment and minimum 700 battery charging/ discharging cycles.	Compliant/ Non Compliant	

Ser No	Criteria and Sub Criteria	Vendor Response	Remarks (if Any)
	(g) The equipment should be **packaged with modern packing material** to assist user in **effective handing and also save equipment from damage** in all weather conditions and during transportation.	Compliant/ Non Compliant	
Desirable Parameters			
32.	**Operating Capability Under Difficult Climatic/ Weather Conditions**. Swarm drones should be capable of operating in light rains and should be able to take off and land in head wind speeds of not less than 50 km per hour - Credit Score 2%	For information only. Compliance not required during submission.	-
33.	**Compliance Certificate**		
	(a) Correctness Certificate (As per Appendix 'D')	Compliant/ NonCompliant	
	(b) Confidentiality Agreement (As per Appendix 'E')	Compliant/ NonCompliant	
	(c) EoI Compliance Certificate (As per Appendix 'F')	Compliant/ NonCompliant	

Station : Signature Company Seal

Date:

Note :

1. All submissions must be on printed copy of Appendix as uploaded on MoD website and should be supported by referenced documents duly authenticated.

2. Any input with incorrect or missing reference will not assessed.

Appendix 'D'
(Refer Para 35 of EoI)

CORRECTNESS CERTIFICATE

It is certified that information submitted in the documents as part of the response to Expression of Interest for the project of Autonomous Surveillance and Armed Drone Swarm (A-SADS) for High Altitude Area is correct and complete in all respects. It is acknowledged that the company will be disqualified from further participation if any information provided is found to be incorrect.

(Signature with Company Seal)

Note : -

1. All submissions must be on printed copy of Appendix as uploaded on MoD website and should be supported by referenced documents duly authenticated.

2. Any input with incorrect or missing reference will not assessed.

Appendix 'E'
(Refer Para 31 of EoI)

CONFIDENTIALITY AGREEMENT

1. It is certified that Expression of Interest document for project of Autonomous Surveillance and Armed Drone Swarm for High Altitude Area will not be shared with any agency in part or full. Only relevant details, as applicable, will be shared with technology partners including foreign technology partners. However, the EoI document itself will not be shared with any technology partners.

2. The company understands the security sensitivity of such an operational system and any information pertaining to deployment and usage of the system including system scaling will not be discussed with third party without a written permission from the Project Facilitation Team. The company understands that failure to observe this agreement will lead to disqualification from the project.

(Signature with Company Seal)

Appendix 'F'
(Refers to Para 24 of EoI)

EoI COMPLIANCE CERTIFICATE

It is certified that all the aspects mentioned in the Expression of Interest for the procurement of Autonomous Surveillance and Armed Drone Swarm for High Altitude Area are being complied to. It is acknowledged that the company will be disqualified from further participation if any aspect mentioned in Expression of Interest is not complied with.

(Signature with Company Seal)

Note : -

1. All submissions must be on printed copy of Appendix as uploaded on MoD website and should be supported by referenced documents duly authenticated.

2. Any input with incorrect or missing reference will not assessed.

Appendix 'G'
(Refer Para 22 of EoI)

INFORMATION PERFORMA

1. Name of the Company.

2. Name of CEO with Designation.

3. Address of the Registered Office.

4. Address of the Factory / Factories.

5. Company Website(s).

6. Date of Incorporation.

7. Brief History of the Company.

8. Category of Industry (Large / Medium / Small / Micro).

9. Nature of Company (Public Limited/ Private Limited).

10. Nature of Business (Manufacture / Trader / Sole selling or Authorised Agent/ Dealer / Assembler / Processor / Re packer/ Service Provider). Please give broad product range as applicable

11. Details of Current Products :-

    (a) Type / Description.

    (b) Licensed / Installed Capacity.

    (c) Annual Production for Preceding 3 Years.

12. Details of Foreign Collaborations if any planned for execution of project.

13. Technology Received from abroad and assimilated / planned for execution of project.

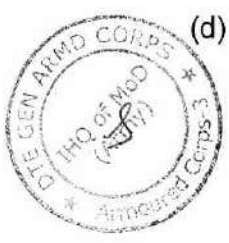
14. Products Already Supplied :-

    (a) To Indian Army / Air Force / Navy.

    (b) PSUs.

    (c) DRDO and its Laboratories.

    (d) Ordinance Factories.



(e) Any other Defence Organisation.

(f) To other Principal Customers.

15. Details of Developmental Facilities :-

(a) R&D Facilities Available.

(b) Number of Technical Manpower.

(c) Percentage of Total Turn-Over Spent on R&D during the Last Three Years.

16. Turnover during the last Three financial Years.

17. Any other relevant information.

18. Contact Details of the Executive nominated to co-ordinate with the Assessment Team (Please provide telephone, mobile and e-mail address).