INVITATION FOR EXPRESSION OF INTEREST FOR PROCUREMENT OF INTEGRATED SURVEILLANCE AND TARGETING SYSTEM (ISAT-S) FOR MECHANISED FORCES UNDER MAKE-II CATEGORY OF DAP-2020

References : **Defence Acquisition Procedure - 2020**.

Appendices :

Appendix A	:	Preliminary Service Qualitative Requirements.
Appendix B	:	Commercial Evaluation Criteria.
Appendix C	:	Technical Evaluation Criteria.
Appendix D	:	Correctness Certificate.
Appendix E	:	Confidentiality Agreement.
Appendix F	:	EoI Compliance Certificate.
Appendix G	:	Information Performa.

1. **Introduction**. The changing nature of warfare as witnessed in ongoing Russia-Ukraine conflict has marked a new phase in using hybrid warfare capabilities that may set a template for future wars. The autonomous systems, miniaturisation, stealth, speed & stand-off precision strike capability have changed the character of war. Therefore, there has been a shift in operational doctrine from **''Massing of Forces'' to "Massing of Effects''** with quantum reduction in physical contact between adversarial forces. Tank remains an indispensable fighting instrument in modern warfare and the most potent weapon platform with inherent protection and firepower to close in with the enemy. However, the changing character of warfare necessitates adding versatility to existing and future fleet of Mechanised Forces. **There is a requirement for providing integral Intelligence Surveillance & Reconnaissance (ISR) capability complemented by precision targeting** capability for engaging adversary's armoured platforms, presently lacking with the Mechanised Forces. This capability will enhance situational awareness of Mechanised Forces commanders, enhance survivability and facilitate accomplishment of assigned mission by causing attrition to adversary's armoured vehicles, thus reducing his fighting capability. Integrated application of **Surveillance Drone and Loitering Munitions** as a system configured suitably on a tank & Infantry Combat Vehicle (ICV) will immensely enhance the integral surveillance and targeting capability of the Mechanised Forces. The inherent advantages of flexible employability, precision, and software domination, Beyond Line of Sight (BLOS) attack capability and increased survivability of Mechanised Forces make this system a potent option for employment in operations.

2. **Objective** The objective of this invitation of Expression of Interest (EoI) is to seek willingness of Indian Vendors to participate in the Make-II Project for procurement of Integrated Surveillance and Targeting System (ISAT-S) for Mechanised Forces under Make-II category of DAP-2020. Indian Vendors meeting the Technical, Commercial and Project Requirements laid out in the EoI will be issued a 'Project Sanction Order' to develop a prototype as per provisions of DAP-2020.

3. **Layout** The EoI has been covered under following parts :-

(a) Part-I : General Information.

(b) Part-II : Scope of the Project.

(c) Part-III : Evaluation Criteria.

(d) Part-IV : Procedure for submission of response to the EoI.

(e) Part-V : Miscellaneous.

4. The nodal officer for this project for all queries/ clarifications/ coordination will be the **Member Secretary, Project Facilitation Team (PFT)**, Integrated Surveillance and Targeting System (ISAT-S) for Mechanised Forces. Address and contact details of the nodal officer are given at **Paragraph 30 of the EoI**.

PART I : GENERAL INFORMATION

5. **Nomenclature**. Integrated Surveillance and Targeting System (ISAT-S) for Mechanised Forces.

6. **Categorisation**. 'In accordance with **Para 5 of Chapter-III of DAP-2020'**. The project shall be further categorised as under :-

(a) **Prototype Development Phase**. '**Make-II (Industry Funded)**', in accordance with Para 5 (b) (i) of Chapter-III of DAP-2020.

(b) **Procurement Phase**. **Buy Indian (IDDM)** with minimum 60% IC, in accordance with Para 6 (d) of Chapter-III of DAP-2020'.

7. **Indigenous Content**. The product will be indigenously designed, developed and manufactured and should have minimum of 60% Indigenous Content (IC) as per provisions of DAP 2020.

8. **Quantities**. The quantities sought for the project are :-

(a) **Prototype Development Stage**. Two systems (one system comprises of 01 x surveillance drone, 04 x Tube Launched Loitering Munitions, 01 x Operator Control Unit, 01 x RVT, 01 x Data Terminal for OCU and RVT and 01 x battery charger for surveillance drone) of Integrated Surveillance and Targeting System (ISAT-S) for Mechanised Forces along with support equipment as under will be provided by DAs at prototype development stage :-

S No	Sub System	Quantity per System	No of Prototype	Total Quantity
(i)	Surveillance drone	01	02	02
(ii)	Tube Launched Loitering Munitions	04	02	08
(iii)	Operator Control Unit	01	02	02
(iv)	Remote Video Terminal	01	02	02
(v)	Data Terminals for OCU and RVT	01 each	02 each	02 each
(vi)	Battery Charger	01	02	02

(b) **Procurement Stage**. 118 systems of Integrated Surveillance and Targeting System (ISAT-S) for Mechanised Forces have been worked out as **Minimum Order Quantity (MOQ)** @ one per Armoured Regiment & Mechanised Infantry Battalion. The Sub-system wise quantity is as tabulated below :-

S No	Sub System	Quantity / per System	Procurement Quantity	Total Quantity
(i)	Surveillance drones	01	118	118
(ii)	Tube launched loitering munitions	04	118	472
(iii)	Operator control units	01	118	118
(iv)	Remote video terminals	01	118	118
(v)	Data Terminals for OCU and RVT	01 each	118 each	118 each
(vi)	Battery chargers	01	118	118
(vii)	Simulators	-	09	09

(c) **Simulators**. Nine simulators will be procured @ one per Corps, which are orbatted with Armoured Regiments and Mechanised Infantry Battalions for imparting training to the crews, in procurement phase from L1 vendor, no prototype is being sought.

9. **Make-II Procedure**. Make-II Procedure is available at Chapter III of DAP-2020 and amendments thereto, will be referred to hereinafter in the case and the copy of the same is available on Ministry of Defence website. The Project Monitoring Team of Indian Army/ MoD constituted will act as interface between Indian Army and Industry during Design and Development stage of the project. **No re-imbursement of development cost is permissible under Make II scheme**.

10. **Appreciated Timelines**. Tentative timelines for the project are as given at **Serial No 14**.

PART II : SCOPE OF THE PROJECT

Integrated Surveillance and Targeting System (ISAT-S) for Mechanised Forces

11. **Scope**. 01 System each for 118 Armoured Regiments & Mechanised Infantry Battalions (68 Armoured Regiments & 50 Mechanised Infantry Battalions) is an inescapable requirement which will be developed by the Indian Industry. This project is aimed at meeting this requirement indigenously. The system will be developed for tanks T-72, T-90 and MBT Arjun and Infantry Combat Vehicle BMP-II.

12. **Preliminary Services Qualitative Requirements (PSQR) of the Proposed System**. PSQR (aligned to DAP-2020) for Integrated Surveillance and Targeting System (ISAT-S) for Mechanised Forces is attached at **Appendix 'A'**.

Time Lines and Milestones

13. Stages of development and procurement are as per Chapter-III of DAP-2020 and amendments thereto.

14. Time Lines & Milestones for the project will be as under :-

Ser No	**Activity**	**Remarks**	**Timelines (from AoN)**
(a)	Issue of EoI	By Project Facilitation Team (PFT)	T_0
(b)	EoI Responses Submission	By EoI respondents (Indian Vendors)	T_0+8 weeks
(c)	EoI Responses Evaluation	By Project Facilitation Team (PFT)	6 weeks T_0+14 weeks
(d)	Short listing of DAs and Issue of Project Sanction Order for Development of Prototype	To selected DAs, those meeting evaluation criteria	2 weeks T_0 +16 weeks
(e)	Design and Development of Prototype and Prototype Readiness Review	(i) Design & Development of Prototype. (ii) Prototype Readiness Review by PFT to ensure matching of development of product as per PSQR. (iii) More than one review may be conducted, on required basis. Dates will be promulgated by the PFT, as per progress of the project.	48 weeks T_0 + 16 to T_0 + 64 weeks
(f)	Single Stage Composite Trials, Ratification and Acceptance of Trial Report, Conversion of PSQRs to GSQRs, Issue of commercial RFP, Solicitation of Commercial Offers and conclusion of contract.	As per DAP-2020 and amendment thereto as applicable. Sequence of activities after development of prototype up to signing of contract will be amplified in the PSO.	-

Development of Prototype and Prototype Readiness Review

15. Prototype will be developed by the selected vendors after the issue of Project Sanction Order. Prototype Readiness Review by PFT to ensure matching of development of product as per PSQR will be carried out. All possible and reasonable assistance and any clarification related to functional or operational aspects of development as sought by DAs will be provided by Project Facilitation Team (PFT).

16. **Single Stage Composite Trials and Staff Evaluations**. After the prototype has been developed as per PSQR given at Appendix 'A', Single Stage Composite Trials (SSCT) of the prototype (s) will be carried out. Service HQ will formulate the 'Trial Directive' which will incorporate the parameters for validating the 'Essential Parameters' during SSCT. Necessary technical literature will be provided by the DAs for conduct of SSCT on the prototype.

17. **Assistance to be Provided**. Assistance to Development Agencies (DAs) will be provided by provision of ranges for carrying out any internal trials. Access to tanks and Infantry Combat Vehicles for integration of the system and various types of equipment for collection of data for training of Artificial Intelligence software will be facilitated by the PFT. Additional assistance if any will be solely at the discretion of the PFT. In case any damage occurring to equipment/ property/ personnel resulting from the testing of the equipment of private entity, the private entity is liable to bear the expenses of repair/ replacement of the facility and all necessary insurance coverage for the job shall be the responsibility of the private entity.

Solicitation of Commercial Offers

18. A commercial Request for Proposal (RFP) for 'Buy (Indian-IDDM)' phase would be issued to all DA(s) for soliciting their commercial offers. Sequence of activity after development of prototype upto signing of contract will be amplified in the PSO. **Additional technical information/ documentation, as may be necessary including those related to Indigenous Content and IPRs would also be required to be provided by the vendor prior to the issue of Commercial RFP** (as applicable).

Deliverables

19. The project is envisaged to have the following deliverables :-

(a) **Prototype Development Stage**. Two systems (one system comprises of 01 x surveillance drone, 04 x Tube Launched Loitering Munitions, 01 x Operator Control Unit, 01 x RVT, 01 x Data Terminal for OCU and RVT and 01 x battery charger for surveillance drone) of Integrated Surveillance and Targeting System (ISAT-S) for Mechanised Forces along with support equipment as under will be provided by DAs at prototype development stage :-

S No	Sub System	Quantity per System	No of Prototype	Total Quantity
(i)	Surveillance drone	01	02	02
(ii)	Tube Launched Loitering Munitions	04	02	08
(iii)	Operator Control Unit	01	02	02
(iv)	Remote Video Terminal	01	02	02
(v)	Data Terminals for OCU and RVT	01 each	02 each	02 each
(vi)	Battery Charger	01	02	02

(b) **Procurement Stage**. 118 systems of Integrated Surveillance and Targeting System (ISAT-S) for Mechanised Forces have been worked out as **Minimum Order Quantity (MOQ)** @ one per Armoured Regiment & Mechanised Infantry Battalion. The Sub-system wise quantity is as tabulated below :-

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(vii)	Simulators	-	09	09

(c) **Simulators**. Nine simulators will be procured @ one per Corps, which are orbatted with Armoured Regiments and Mechanised Infantry Battalions for imparting training to the crews, in procurement phase from L1 vendor, no prototype is being sought.

(d) Training and Technical literature to include User Hand Book, Preservation Instructions, Complete Equipment Schedule and Technical Manuals. These will be provided with the equipment during the procurement phase. Details will be further amplified in the Request for Proposal (RFP).

(e) **Warranty**. The goods supplied shall carry a standard warranty for 24 months from the date of acceptance by JRI. Details will be further amplified in the Commercial Request for Proposal (RFP).

(f) **Engineering Support Package (ESP)**. Engineering Support Package after two years warranty will be required for repair & maintenance of the equipment. Details will be further amplified in the Request for Proposal (RFP).

Intellectual Property Rights

20. As per provision of Para 59, chapter III of DAP 2020. Further, based on development of the prototype, a comprehensive list of design documents (to be informed subsequently) will need to be submitted by the development Agencies for the PFT.

PART-III : EVALUATION CRITERIA

Commercial Evaluation Criteria

21. EoI respondents will furnish their response to the Commercial Evaluation Criteria as per **Appendix 'B'**.

Technical Evaluation Compliance Matrix

22. The respondents to this EoI are required to furnish information and compliance/ information as per **Appendix 'C'** against PSQR of the equipment.

23. **Indigenous Content**. Post successful development of prototype(s), further procurement will be as per the **'Buy (Indian-IDDM)'** procedure with a **minimum of 60% Indigenous Content**.

24. **Additional Information**. Additional information required to be furnished as part of the EoI response is given at **Appendix 'G'**.

25. **Foreign Collaboration**. If the EOI respondent is collaborating / plans to collaborate with a foreign technology provider, the nature of such collaboration and the technology areas being transferred must be stated in the response as also incl details regarding scope, depth & range of ToT, detls of formal acceptance by foreign partner's government (i.e country of origin) that any license reqd to transfer technology will be granted in case selected.

26. **Indigenisation of Critical Technology**. Details pertaining to indigenisation of critical technology to be furnished as part of the EoI responses (please refer Para 17 of **Appendix 'G'**).

PART-IV : PROCEDURE FOR SUBMISSION OF RESPONSE TO THE EoI

27. The response to the EoI shall be submitted as per formats given at **Appendix 'B'** to **Appendix 'G'**.

28. **Guidelines for Submitting EoI Responses**.

(a) The responses should be submitted strictly as per the formats given in respective Appendices. Should a vendor need to mention any other information, a separate column / row may be added. Vendors should provide compliance or non-compliance to parameters and no conditional response/ compliance shall be submitted by the firm/ vendors.

(b) All responses and Appendices should be submitted in a single file / folder. Supporting documents / additional references should be submitted in a separate folder with proper reference mentioned against each parameter / sub parameter in respective appendices.

(c) Any supporting document / evidence without any reference to specific parameter of criteria will not form part of the assessment.

29. **Rejection Criteria for Selection as DAs**. The following may lead to rejection of EoI response :-

(a) Failure to meet Commercial Evaluation Criteria given at **Appendix 'B'**.

(b) Failure to meet/ comply with the Technical Evaluation Criteria Specifications given at **Appendix 'C'**.

(c) Failure to offer compliance to any of the terms and conditions given in the EoI.

(d) Failure to submit certificates as mentioned at **Appendix 'D'** to **Appendix** '**G'** of the EoI.

(e) Any other parameter of the response considered inadequate by the MoD, Government of India.

30. **Foreclosure Criteria**. As per provisions of Para 20, Chapter-III of DAP-2020, no government funding is envisaged for prototype development, but there is an assurance of orders on successful development and trials of prototype. No foreclosure of the project will be done after issue of Project Sanction Order other than for reasons of default / non-adherence to Project Sanction Order by vendors or delay by DA to produce the prototype for trials.

31. The EoI respondent shall submit three (03) copies of response to the EoI, clearly marking one copy as '**Original Copy**' and second & third as '**Duplicate Copy and Triplicate Copy**'. In the event of any discrepancy between them, the original copy shall govern/ prevail. Each page of the response will bear the signatures of the authorised signatory of the company. The DA shall also submit a soft copy of the response to this EoI in a CD/ DVD.

32. **The Envelopes shall be Addressed as under**:-

Secretary, Project Facilitation Team
General Staff Branch/ Armoured Corps-3,
Directorate General of Armoured Corps, Integrated HQ of MoD (Army)
Room No 501, 'A' Wing, Sena Bhawan
DHQ PO, New Delhi - 110011
Email id - xecoord-2020@gov.in
Tele No - 33564

33. The responses to this EoI must be submitted by **12 Feb 2024** at the above mentioned address.

34. The Company will be required to sign and honour the 'Confidentiality Agreement' with MoD Govt of India. The 'Confidentiality Agreement' will be furnished by each EoI respondent at the time of submission of EoI responses as per format given at **Appendix 'E'**.

PART-V : MISCELLANEOUS

35. **Pre EoI Responses Meeting** A pre-response meeting will be held on **22 Jan 2024** at Directorate General of Armoured Corps (Armoured Corps-3), New Delhi-110011. Vendors are required to submit their queries / clarifications / amplifications in writing to this office by **15 Jan 2024**.

36. Guidelines for penalties in business dealings with entities as promulgated by Government from time to time, will be applicable on procurement process & bidders.

37. The Pre-Contract Integrity Pact (PCIP), listed as detailed in Paragraph 92 of Chapter II of DAP-2020, shall apply mutatis mutandis to the 'Buy (Indian-IDDM)' phase of 'Make' project.

38. Respondents would be subject to disqualification if they make false, incorrect or misleading claims in their response to this EoI. A 'Correctness Certificate' as per the format at **Appendix 'D'** will be furnished as part of the response.

39. **QA Standards Applicable**. List of QA tests will be provided at the time of issue of Project Sanction Order (PSO). However, broad QA standards as applicable in the Extant case are as given below :-

(a) **Electronic Items**. Combination of Table L2A, L2J and L3 of JSS-55555.

(b) **Opto Electronics Part**. JSS-5855-11-2019 (Revision 1).

(c) **Warhead / Amn/ Bomb/ Fuse**. JSG-0102.

40. Please acknowledge the receipt of this invitation for EoI.

Sd/- x x x x x x

File No : A/36026/ISAT-S/GS/AC-3

Dated : 13 Dec 2023

(**Sumeet Bhat**)
Colonel
Member Secretary
Project Facilitation Team
Directorate General of Armoured Corps
Armd Corps-3

Enclosures : **Appendices 'A' to Appendix 'G'**.

Appendix 'A'
(Refer Para 12 of EoI)

PRELIMINARY STAFF QUALITATIVE REQUIREMENT FOR INTEGRATED SURVEILLANCE AND TARGETING SYSTEM (ISAT-S) FOR MECHANISED FORCES

1.	Reference of GS Policy Statement	-	**350**
2.	PSQR No	-	**124**
3.	Other Previous PSQR No	-	**Nil**
4.	Reference GSEPC Meeting	-	**10th (2022) GSEPC mtg held on 30 Dec 2022**
5.	Sponsor Dte	-	**Dte Gen Armd Corps (AC-3)**
6.	Sponsor Dte File No	-	**A/36026/ISAT-S/GS/AC-3**
7.	Nomenclature	-	**INTEGRATED SURVEILLANCE AND TARGETING SYSTEM (ISAT-S) FOR MECHANISED FORCES**
8.	Security Classification	-	**RESTRICTED**
9.	Priority of Development	-	**PRIORITY-I / On Immediate Basis**
10.	Next Review Due	-	**As on Required Basis**
11.	PSQR being superseded	-	**Nil**.

GENERAL INFORMATION

Introduction

12. In the present battlefield, the threat to tanks have increased manifold from non traditional threats like top attack ATGMs, Loitering munitions & drones. The advent of Unmanned Systems (Surveillance Drones and Loitering Munition) on the battlefield has provided an integrated solution to mitigate this operational challenge faced by the Mechanised Forces. Such integral capability with forward troops is an operational imperative to shape the immediate battlefield for seamless operational move and manoeuvres.

Operational Philosophy/ Proposed Employment

13. The changing nature of warfare as witnessed in ongoing Russia-Ukraine conflict has marked a new phase in using hybrid warfare capabilities and may set the template for future hostilities. The autonomous systems, miniaturisation, stealth, speed & stand-off precision strikes have changed the character of war. Therefore, there has been shift in operational doctrine from "**Massing of Forces**'' **to** "**Massing of Effects**'' with quantum reduction in physical contact between adversarial forces.

14. Tank remains an indispensable fighting instrument in modern warfare and the most potent weapon platform with inherent protection and firepower to close in with the enemy. However, the changing character of warfare necessitates adding versatility to existing and future fleet of Mechanised Forces. **There is a requirement for providing integral Intelligence Surveillance & Reconnaissance (ISR) capability complemented by precision strike & targeting** capability for engaging adversary's wpn platforms. Recent wars have demonstrated that detachments with third generation ATGMs, Loitering munitions and drones have effectively engaged tanks due to the **limitations of the tk in terms of BLOS surveillance and precision targeting capability**. The surveillance resources presently held with Armoured Regiments like **BFSRs have limited capability and is more suitable for defensive static surveillance, when part of a surveillance grid.** This system will provide the Mechanised Forces with the capability to carry out **surveillance on the move of the intended area of operations, detect adversary's weapon platforms for engagement with suitable weapon systems and undertake precision engagement of adversary armoured vehicles with Loitering Munitions**, thus reducing enemy resistance and increasing own survival and thus chances of mission accomplishment.

Aim

15. To lay down Qualitative Requirements for Integrated Surveillance and Targeting System for Mechanised Forces.

ESSENTIAL PARAMETERS

PART-I : OPERATIONAL PARAMETERS

16. The Operational Parameters of Integrated Surveillance and Targeting System for Mechanised Forces are as follows : -

(a) **System Components**.

(i) One Surveillance drone.

(ii) One Operator Control Unit (OCU) to be integrated on Tanks & ICVs.

(iii) One Remote Video Terminal (RVT).

(iv) Data terminals for both OCU & RVT with antenna and suitable communication equipment.

(v) Four Tube launched Loitering Munitions.

(vi) **Optical Sensors**. Both Surveillance drone and Loitering Munition will consist of :-

(aa) Colour Day Video Camera.

(ab) Monochromatic Night Thermal Camera.

(vii) **Explosive Payloads**. Loitering Munition will carry Anti Tank Shaped Charge Top Attack ammunition.

(viii) Suitable battery chargers to enable charging the batteries of surveillance drone from AC mains and generators and also from DC 12 V power supply of in-service 4 x 4 GS vehicles.

(b) **Launch Altitude**. The ISAT-S should be capable of being launched from altitudes upto 4500 mtr AMSL.

(c) **Operating Altitude**. The ISAT-S should be capable of operating at the following altitudes :-

(i) **Surveillance Drone**. Not less than 1000 mtr Above Ground Level.

(ii) **Loitering Munition**. Not less than 500 mtr Above Ground Level.

(d) **Operating Temperature**. The ISAT-S system should be able to operate in temperatures as tabulated below :-

S No	Area	Min Temp	Max Temp
(i)	Plains	Between 0^0 C to 5^0 C	Between 40^0 C and 45^0 C
(ii)	HAA (Post)	Between Minus 20^0 C and minus 10^0 C	As actually obtained in locs where proposed to be used @
@ In case also used in Plains, max temp at (a) above would be applicable.			

(e) **Operating Range**.

(i) **Surveillance Drone**. Not less than 20 km one way.

(ii) **Loitering Munition**. Not less than15 Km one way.

(f) **Endurance**.

(i) **Surveillance Drone**. Not less than 90 Minutes.

(ii) **Loitering Munition**. Loitering time should not be less than 15 minutes at maximum range and loitering munition should have return home capability after loitering for 15 minutes at maximum ranges.

(g) **Launch and Retrieval**.

(i) **Surveillance Drone**. Vertical Take Off and Landing (VTOL)/Tube/ Canister launched from ground.

(ii) **Loiter Munition**. Tube launched from **tank & ICV**.

(h) **Operating Capability under Difficult Climatic/ Weather Conditions**. ISAT-S should be capable of operating in light rains and wind speeds not less than 35 km per hour.

(j) The navigation system should be compatible with GPS/GLONOSS/IRNSS-NAVIC.

(k) The system should be able to **function in a GPS/ IRNSS-NAVIC/ GLONASS degraded/ denied environment**.

(l) **Flight Modes**. The Surveillance Drone and Loitering Munition should be able to operate in the following flight modes :-

(i) Surveillance Drones should be able to operate in the following modes:-

(aa) **Fully Autonomous Mode**. Follow a pre-programmed flight path; dynamic re-programming of the flight path must be possible.

(ab) **Semi-Autonomous Mode**. Control of throttle and altitude of the AV by the operator with other parameters being controlled by the autopilot.

(ac) **Target Seeking Mode**. Keep camera locked on to a fixed/ moving target.

(ad) **Camera Guide Mode**. Follow a locked on moving target.

(ae) **Manual Mode**. For the pilot to physically control the AV for manoeuvring (in case of autopilot failure or manual override).

(af) **Return Home Mode**. The surveillance drone and Loitering Munition should have programme Return Home Mode.

(ii) Loitering Munitions should be able to operate in the following modes:-

(aa) **Fully Autonomous Mode**. Follow a pre-programmed flight path; dynamic re-programming of the flight path must be possible.

(ab) **Semi-Autonomous Mode**. Control of throttle & altitude of the AV by the operator with other parameters being controlled by the autopilot.

(ac) **Loiter Mode** Fly around a fixed point / **moving target**.

(ad) **Manual Mode**. For the pilot to physically control the AV for manoeuvring (in case of autopilot failure or manual override).

(ae) **Return Home Mode**. The surveillance drone and Loitering Munition should have programme Return Home Mode.

(m) **Integration on in - service AFVs (Tanks T-72, T-90, MBT Arjun) & ICV**. Following integration aspects will be carried out on tanks & ICV :-

(i) One Tube launched loitering munition should be integrated on tanks & ICV platforms.

(ii) They should be **'Ready to Launch'** and capable to be launched from inside the tank & ICV using controls of Operator Control Unit (OCU).

(iii) The fitment should not have a major impact on the silhouette of the **'A'** vehicle and also should not hinder in the functioning of any other system/ sub-system of the tanks & ICVs.

(iv) Loitering Munitions should draw its electrical power requirement from the platform.

(v) Loitering Munitions and mounting assembly should be able to withstand the vibrations of tanks and ICVs during move and shock of discharge during firing.

PART-II : TECHNICAL PARAMETERS

17. The Technical Parameters for Integrated Surveillance and Targeting System for Mechanised Forces are as follows :-

(a) **Surveillance Drone**.

(i) **Colour Day Video Camera**. Colour Day Video Camera will have the following specifications :-

(aa) 3 Axis gimbal based stabilisation.

(ab) **WFOV**. Not less than 60^0.

(ac) **Pan**. $\pm$ 180^0.

(ad) **Tilt**. Not less than Minus 45^0 to plus 90^0 from the horizontal.

(ae) **Ranges**. Minimum Oblique ranges in clear weather should be as under :-

	'A' Vehicle	**'B' Vehicle**	**Human Targets**
Detection	4000 mtr	4000 mtr	2000 mtr
Recognition	2500 mtr	2500 mtr	1000 mtr
Identification	1000 mtr	1000 mtr	600 mtr

(af) Capable of taking still images.

(ag) **Automatic Target Recognition**. The Artificial Intelligence enabled automatic target recognition ranges should not be less than 1500 mtr for an Armoured Fighting Vehicle.

(ii) **Monochromatic Night Thermal Camera**. Monochromatic Night Thermal Camera with following specifications will be provided :-

(aa) **Pan**. $\pm$ 180^0.

(ab) **Tilt**. Not less than Minus 45^0 to plus 90^0 from the horizontal.

(ac) **Ranges**. Minimum Oblique ranges in clear weather:-

	A Vehicle	**B Vehicle**	**Human Targets**
Detection	2500 mtr	2000 mtr	700 mtr
Recognition	1000 mtr	800 mtr	500 mtr
Identification	600 mtr	400 mtr	250 mtr

(ad) **Automatic Target Recognition**. The Artificial Intelligence enabled automatic target recognition ranges should not be less than 500 mtr for an Armoured Fighting Vehicle.

Loitering Munition

18. The characteristics of loitering munitions should be as follows :-

(a) **Sensor Package**. The sensors on board should provide live video feed to the GCS and have following capabilities :-

(i) **Day EO Sensor**. Minimum Oblique ranges in clear weather should be as under :-

	A Vehicle	B Vehicle
Detection	2000 mtr	2000 mtr
Recognition	1000 mtr	1000 mtr
Identification	600 mtr	600 mtr

(ii) **Night Thermal Sensor**. Minimum oblique ranges in clear weather should be as under :-

	A Vehicle	B Vehicle
Detection	1000 mtr	800 mtr
Recognition	600 mtr	400 mtr
Identification	400 mtr	300 mtr

(b) Loitering Munition should carry a shaped charged Top attack tandem warhead capable of defeating Explosive Reactive Armour (ERA).

(c) **Penetration**. Not less than 150 mm RHA beyond ERA.

(d) **CEP**. The loitering munition should be capable of engaging Armoured vehicles with a CEP of not more than 1.5 meters.

(e) **Target Acquisition**. Target acquisition during day and night using user controlled optical interface & engagement with 'Man in the Loop' control.

(f) **Abort & Re-attack Capability**. The Loitering Munition should have abort & Re-attack capability.

(g) **Recover & Re-use Capability**. The Loitering Munition should have recover & re-use capability.

(h) The Back Pressure generated during the launch of Loitering Munition should not impact functioning/ cause damage to component/ systems/sub system fitted on the tank & ICV.

(j) The Loitering Munitions should be hermetically sealed.

19. **Safety Features**.

(a) The weapon system should have in built safety features to safe guard the crew handling the munition during transit, assembly and maintenance.

(b) The system with or without fuse should be safe to handle and be capable of withstanding rough handling under operational conditions.

(c) **Arming Safety**. The weapon should be capable of being armed and fired immediately when required.

(d) Safety in handling, repair and in the event of misfire to be ensured.

(e) Blast protection measures during firing should be incorporated.

20. **Operator Control Unit (OCU)**. OCU should be fitted on board the Launcher vehicle (Tank/ ICV) and have the following capabilities :-

(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 Integrated Surveillance and Targeting System operation should be indicated.

(b) **User Controls**. The OCU should provide all required controls to the user for operating the surveillance drone and the loitering munition.

(c) The Control Station should be fitted on board the Launcher vehicle (Tank/ ICV) and control both surveillance drone and loitering munitions and carry out the following tasks :-

(i) Carrying out mission planning.

(ii) Simultaneous control of two or more Loitering Munitions.

(iii) Target selection, mission planning and control of the munition system including recovery.

(iv) Guide the munition to the target as per desired accuracy.

(v) Surveillance drone should provide coordinates & type of target to OCU to facilitate selection of target and launch of Loitering munition towards the target, the final engagement of target will be based on Man in the Loop based on video feed provided by the Loitering Munition.

(d) **Display**. The OCU should display the following :-

(i) Geographic and DSM map along with Aerial Vehicle (AV) location, loitering munition location, waypoints and flight plan.

(ii) Real - time AV parameters should be displayed at all times during the flight, such as velocity, position and flight mode.

(iii) Display live video and a synchronised moving map in realtime.

(e) The OCU should be detachable to be used outside the tank/ICU when required.

(f) RAM, processor and display of suitable specifications should be provided.

(g) Record and replay optical sensor output, a Solid State Disk (SSD) of minimum 4 TB must be provided.

(h) OCU should be ruggedized to conform to MIL STD 810 G.

21. **Remote Video Terminal**. RVT should have the capability to launch and operate the surveillance drone and obtain surveillance input from EO/ IR payload of the drone upto the maximum operating range of the surveillance drone.

22. **Ground Data Terminal (GDT)**. High power data links to transmit commands between OCU, surveillance drone and Loitering Munition be provided with following specifications :-

(a) **Op Frequency**. The system should be capable of operating in unlicensed ISM band. It should have a suitable uplink and downlink with the OCU secured with **256** bit AES encryption **or higher standards**. The transmission must be digital. Frequencies utilised should not interfere with the communication equipment of the in-service tanks and ICVs & there should be no interference between drone & Loitering Munitions communication links.

(b) Suitable communication equipment be provided for control of surveillance drone by RVT.

(c) Anti jamming and anti-spoofing measures be incorporated in both system hardware and software.

23. **Map**. A moving map to be provided in a resizable window with following facilities :-

(a) **DSM Compatibility**. The system should be compatible with Defence Series Maps (DSM).

(b) There should be facilities to :-

(i) Annotate the map.

(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-synchronies the map to the drones, as desired.

(iii) Allow selection of way points and flight path.

(iv) Measure distance between ground points.

(v) Enlarge and reduce the map (zoom in / out).

24. **Training Simulator**. The training simulator should have following capabilities :-

(a) Should comprise of separate instructor & student consoles.

(b) The instructor console should be able to execute following actions :-

(i) Planning training mission.
(ii) Setting tactical scenario.
(iii) Define operational conditions.
(iv) Setting up mission for students.
(v) Observation of the mission executed by students.
(vi) Assessment of student performance record.

(vii) Maintenance of student performance record.

(viii) Generate training report.

(c) The student console should comprise of Command & Control Station, Communication Station & Launcher Station for Unmanned Aerial Vehicle (UAV) and Loitering Munition. It should be able to simulate activity starting from mission preparation to execution including abort & re-launch mission as per instructor's directions mentioned above.

(d) The simulator's technical specification should be compatible with Defence Series Map.

(e) The simulator should have projector to reflect actions at instructor & student consoles.

PART-III : MAINTAINABILITY & ERGONOMIC PARAMETERS

25. The Integrated Surveillance and Targeting System for Mechanised Forces should have the following operational and maintain ability characteristics :-

(a) It should comply to the environment parameters as laid down on Table 3-1 of JSS-55555 2020 Revision 4 standards.

(b) It should conform to Optoelectronic equipment (Day and Night Camera) compliant to JSS-5855-11-2019.

(c) It should conform to software been verified and validated as per IEEE-12207.

(d) **EMI/EMC Compliance**. EMI/EMC compliance testing will be carried out by ACE, Mhow. **Integrated Surveillance and Targeting System (ISAT-S)** and its sub systems/ sub-assemblies should be EMI/EMC compliant as under :-

(i) System/Platform/Ord level (for Mil grade equipment) - As per MIL-STD-464C.

(ii) Sub systems level (for Mil grade equipment) - As per MIL-STD-464E or better.

(iii) COTS systems/ Sub systems (for commercial equipment) - As per CISPR/IEC/FCC Standards.

(e) Storage of explosive payload should confirm to ammunition storage regulations stipulated as per STEC guidelines.

(f) **Service Life**.

(i) **Surveillance Drone**. The service life should not be less than 1000 landings for Drones, not less than 10 years for IT equipment and minimum 500 battery charging/ discharging cycles.

(ii) **Loitering Munition**. 10 years or more.

DESIRABLE PARAMETERS

26. **CEP**. The Loitering Munitions should be capable of engaging Armoured Vehicles with a CEP of not more than **1 meter**.

27. The ISAT-S system should be capable of being launched from altitudes of upto 5500 mtr AMSL.

28. Minimum ATR ranges for the Monochromatic Night Thermal Camera of surveillance drone should not be less than 800 mtr.

PSQR PREPARED BY AC-3/ DG ARMD CORPS

- **Prepared By** - Col Sumeet Bhat, Col, AC-3
  Lt Col Alok Singh, GSO-1, AC-3
- **Vetted By** - Brig Anuj Kalia, VSM, Brig AC-A (CD&S)
- **Office Address** - Room No 501, 5th Floor, 'A' Wing, Sena Bhawan
  Tele No - 33564

Appendix 'B'
(Refer Para 21 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.	Supporting documents to be provided.
(c)	Category of Industry.	Large / Medium / Small / Micro / DPSU/ Start Up.	Supporting documents to be provided.
(d)	Registration Details (MSMEs to provide UDYAM certificate, Start Up Companies to provide DIPP License, others to provide Registration Certificate as applicable).	Yes / No.	Supporting documents to be provided.
(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 2023.	To be provided.	(i) Supporting documents to be attached. (ii) CA vetted certificate to be provided.
(f)	Net worth of previous financial year ending **31 Mar 2023**.	Positive / Negative.	CA vetted certificate to be provided.
(g)	**Credit Rating**. The entity shall have long-term issuer credit rating equivalent to Credit Rating Information Services of India Limited (CRISIL) or ICRA Limited **"BBB" accorded** by Reserve Bank of India (RBI) / Securities Exchange Board of India (SEBI) approved agencies. In case of MSMEs, the minimum rating should be 'SME-4'. Rating report should not be older than 12 (twelve) months and be the latest available rating.	Provided/ Not Provided.	Supporting documents to be attached.

Ser No	**Criteria**	**Vendor Submission**	**Remarks (if Any)**
(h)	Defence Industrial License details.	Yes/ Applied for/ Being Applied for.	Supporting documents to be attached.

Date : 2023.

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 'C'
(Refer Para 22 of EoI)

TECHNICAL EVALUATION CRITERIA

Ser No	Criteria and Sub Criteria	Vendor Response	Remarks (if Any)
1.	Indigenous content will be minimum 60% during procurement stage as per DAP-2020	Compliant/ Non Compliant	
2.	Indigenous design as per provision of DAP-2020	Compliant/ Non Compliant	
3.	**Timelines**		
	(a) Development of prototype 48 weeks.	Compliant/ Non Compliant	
	(b) Delivery of items as per delivery schedule - 24 months	Compliant/ Non Compliant	
4.	Confirmation of capability to develop and provide equipment to meet user requirements specified in **Appendix 'A'** (PSQR).	Compliant/ Non Compliant	
5.	Proposed system configuration (broad design details).	Provided/ Not Provided	
6.	**Experience**. Min 01 year experience in broad areas like manufacturing, electronics, explosive, drones, Loitering Munitions 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
7.	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			
8.	**Launch Altitude**. The ISAT-S should be capable of being launched from altitudes upto 4500 mtr AMSL.	Compliant/ Non Compliant	
9.	**Operating Altitude**. The ISAT-S should be capable of operating at the following altitudes :- (a) Surveillance drone - Not less than 1000 mtr Above Ground Level. (b) Loitering Munition - Not less than 500 mtr Above Ground Level.	Compliant/ Non Compliant	
10.	**Operating Temperature**. The ISAT-S system should be able to operate in temperatures from minus 20^0C to 45^0C.	Compliant/ Non Compliant	
11.	**Operating Range**. (a) **Surveillance Drone**. Not less than 20 km one way. (b) **Loitering Munition**. Not less than 15 Km one way.	Compliant/ Non Compliant	
12.	**Endurance**. (a) **Surveillance Drone**. Not less than 90 Minutes. (b) **Loitering Munition**. Loitering time not less than 15 minutes at Maximum Range.	Compliant/ Non Compliant	
13.	**Launch and Retrieval**. (a) **Surveillance Drone**. Vertical Take Off and Landing (VTOL)/ Tube/Canister launched from ground. (b) **Loiter Munition**. Tube launched from **tank & ICV**.	Compliant/ Non Compliant	

Ser No	Criteria and Sub Criteria	Vendor Response	Remarks (if Any)
14.	**Operating Capability under Difficult Climatic/ Weather Conditions**. ISAT-S should be capable of operating in light rains and wind speeds of not less than 35 km per hour.	Compliant/ Non Compliant	
15.	**Flight Modes**. The Surveillance Drone and Loitering Munition 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 throttle & altitude of the AV by the operator with other parameters being controlled by the autopilot.	Compliant/Non Compliant	
	(c) **Target Seeking Mode**. Keep camera locked on to a fixed/ moving target.	Compliant/Non Compliant	
	(d) **Camera Guide Mode**. Follow a locked on moving target.	Compliant/Non Compliant	
	(e) **Manual Mode**. For the pilot to physically control the AV for manoeuvring (in case of autopilot failure or manual override).	Compliant/Non Compliant	
	(f) Loitering Munitions should be able to operate in the following modes :-		
	(i) **Fully Autonomous Mode**. Follow a pre-programmed flight path; dynamic re-programming of the flight path must be possible.	Compliant/Non Compliant	
	(ii) **Semi-Autonomous Mode**. Control of throttle & altitude of the AV by the operator with other parameters being controlled by the autopilot.	Compliant/Non Compliant	
	(g) **Loiter Mode**. Fly around a fixed point / **moving target** .	Compliant/Non Compliant	
	(h) **Manual Mode**. For the pilot to physically control the AV for manoeuvring (in case of autopilot failure or manual override).	Compliant/Non Compliant	
	(j) **Return Home Mode**. The surveillance drone and Loitering Munition should have programme Return Home Mode .	Compliant/Non Compliant	

Ser No	Criteria and Sub Criteria	Vendor Response	Remarks (if Any)
16.	**Integration on in-service AFVs (Tanks T-72, T-90, MBT Arjun) & ICV BMP 2/2K**. Following integration aspects will be carried out on tanks & ICV :-		
	(a) One Tube launched loitering munition should be integrated on tanks & ICV platforms.	Compliant/ Non Compliant	
	(b) They should be **'Ready to Launch'** and capable to be launched from inside the tank & ICV using controls of Operator Control Unit (OCU).	Compliant/ Non Compliant	
	(c) The fitment should not have a major impact on the silhouette of the **'A'** vehicle & also should not hinder in the functioning of any other system / sub-system of the tanks & ICVs.	Compliant/ Non Compliant	
	(d) Loitering Munitions should draw its electrical power requirement from the platform.	Compliant/ Non Compliant	
	(e) Loitering Munitions and mounting assembly should be able to withstand the vibrations of tanks and ICVs during move and shock of discharge during firing.	Compliant/ Non Compliant	
Technical Parameters			
17.	**Surveillance Drone**.		
	(a) **Colour Day Video Camera**. Colour Day Video Camera will have the following specifications :-		
	(i) 3 Axis gimbal based stabilisation	Compliant/ Non Compliant	
	(ii) **WFOV**. Not less than 60^0.	Compliant/ Non Compliant	
	(iii) **Pan**. $\pm$ 180^0.	Compliant/ Non Compliant	
	(iv) **Tilt**. Not less than Minus 45^0 to plus 90^0 from the horizontal.	Compliant/ Non Compliant	
	(v) **Ranges**. Slant ranges in clear weather should be as under :- 'A' Vehicle / 'B' Vehicle / Human Targets **Detection** 4000 mtr / 4000 mtr / 2000 mtr **Recognition** 2500 mtr / 2500 mtr / 1000 mtr **Identification** 1000 mtr / 1000 mtr / 600 mtr	Compliant/ Non Compliant	

Ser No	Criteria and Sub Criteria	Vendor Response	Remarks (if Any)
	(vi) Capable of taking still images.		
	(vii) **Automatic Target Recognition**. The Artificial Intelligence enabled automatic target recognition ranges should not be less than 1500 mtr for an Armoured Fighting Vehicle.		
	(b) **Monochromatic Night Thermal Camera**. Monochromatic Night Thermal Camera with following specifications will be provided :-		
	(i) **Pan**. $\pm$ 180^0.	Compliant/ Non Compliant	
	(ii) **Tilt**. Not less than Minus 45^0 to plus 90^0 from the horizontal.	Compliant/ Non Compliant	
	(iii) **Ranges**. Slant ranges in clear weather:- **A Vehicle** **B Vehicle** **Human Targets** **Detection** 2500 mtr 2000 mtr 700 mtr **Recognition** 1000 mtr 800 mtr 500 mtr **Identification** 600 mtr 400 mtr 250 mtr	Compliant/ Non Compliant	
	(iv) **Automatic Target Recognition**. The Artificial Intelligence enabled automatic target recognition ranges should not be less than 500 mtr for an Armoured Fighting Vehicle.	Compliant/ Non Compliant	
18.	**Loitering Munition**. The characteristics of loitering munitions should be as follows :-		
	(a) **Sensor Package**. The sensors on board should provide live video feed to the GCS and have following capabilities :-		

Ser No	Criteria and Sub Criteria	Vendor Response	Remarks (if Any)
	(i) **Day EO Sensor**. Slant ranges in clear weather should be as under :- **A Vehicle** / **B Vehicle** **Detection** 2000 mtr / 2000 mtr **Recognition** 1000 mtr / 1000 mtr **Identification** 600 mtr / 600 mtr	Compliant/ Non Compliant	
	(ii) **Night Thermal Sensor**. Slant ranges in clear weather should be as under :- **A Vehicle** / **B Vehicle** **Detection** 1000 mtr / 800 mtr **Recognition** 600 mtr / 400 mtr **Identification** 400 mtr / 300 mtr	Compliant/ Non Compliant	
	(b) Loitering Munition should carry a shaped charged Top attack tandem warhead capable of defeating Explosive Reactive Armour (ERA).	Compliant/ Non Compliant	
	(c) **Penetration**. Not less 150 mm RHA beyond ERA.	Compliant/ Non Compliant	
	(d) **CEP**. The loitering munition should be capable of engaging Armoured vehicles with a CEP of not more than 1.5 meters.	Compliant/ Non Compliant	
	(e) **Target Acquisition**. Target acquisition during day and night using user controlled optical interface & engagement with 'Man in the Loop' control.	Compliant/ Non Compliant	
	(f) **Abort & Re-attack Capability**. The Loitering Munition should have abort & Re-attack capability.	Compliant/ Non Compliant	
	(g) **Recover & Re-use Capability**. The Loitering Munition should have recover & re-use capability.	Compliant/ Non Compliant	

Ser No	Criteria and Sub Criteria	Vendor Response	Remarks (if Any)
	(h) The Back Pressure generated during the launch of Loitering Munition should not impact functioning/ cause damage to component/ systems/sub system fitted on the tank & ICV.	Compliant/ Non Compliant	
	(j) The Loitering Munitions should be hermetically sealed.	Compliant/ Non Compliant	
19.	**Safety Features**.		
	(a) The weapon system should have in built safety features to safe guard the crew handling the munition during transit, assembly and maintenance.	Compliant/ Non Compliant	
	(b) The system with or without fuse should be safe to handle and be capable of withstanding rough handling under operational conditions.	Compliant/ Non Compliant	
	(c) **Arming Safety**. The weapon should be capable of being armed and fired immediately when required.	Compliant/ Non Compliant	
	(d) Safety in handling, repair and in the event of misfire to be ensured.	Compliant/ Non Compliant	
	(e) Blast protection measures during firing should be incorporated.	Compliant/ Non Compliant	
20.	**Operator Control Unit (OCU)**. OCU should be fitted on board the Launcher vehicle (Tank/ ICV) and have the following capabilities :-		
	(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 Integrated Surveillance and Targeting System operation should be indicated.	Compliant/ Non Compliant	
	(b) **User Controls**. The OCU should provide all required controls to the user for operating the surveillance drone and the loitering munition.	Compliant/ Non Compliant	
	(c) The Control Station should be fitted on board the Launcher vehicle (Tank/ ICV) and control both surveillance drone and loitering munitions and carry out the following tasks :-		
	(i) Carrying out mission planning.	Compliant/ Non Compliant	
	(ii) Simultaneous control of two or more Loitering Munitions.	Compliant/ Non Compliant	

Ser No	Criteria and Sub Criteria	Vendor Response	Remarks (if Any)
	(iii) Target selection, mission planning and control of the munition system including recovery.	Compliant/ Non Compliant	
	(iv) Guide the munition to the target as per desired accuracy.	Compliant/ Non Compliant	
	(v) Surveillance drone should provide coordinates & type of target to OCU to facilitate selection of target and launch of Loitering munition towards the target, the final engagement of target will be based on Man in the Loop based on video feed provided by the Loitering Munition.	Compliant/ Non Compliant	
	(d) **Display**. The OCU should display the following:-		
	(i) Geographic and DSM map along with Aerial Vehicle (AV) location, loitering munition location, 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	
	(e) The OCU should be detachable to be used outside the tank/ICU when required.	Compliant/ Non Compliant	
	(f) RAM, processor and display of suitable specifications should be provided.	Compliant/ Non Compliant	
	(g) Record and replay optical sensor output, a Solid State Disk (SSD) of minimum 4 TB must be provided.	Compliant/ Non Compliant	
	(h) OCU should be ruggedized to conform to MIL STD 810 G.	Compliant/ Non Compliant	
21.	**Remote Video Terminal**. RVT should have the capability to launch and operate the surveillance drone and obtain surveillance input from EO/ IR payload of the drone upto the maximum operating range of the surveillance drone.	Compliant/ Non Compliant	
22.	**Ground Data Terminal (GDT)**. High power data links to transmit commands between OCU, surveillance drone and Loitering Munition be provided with following specifications :-		

Ser No	Criteria and Sub Criteria	Vendor Response	Remarks (if Any)
	(a) **Op Frequency**. The system should be capable of operating in unlicensed ISM band. It should have a suitable uplink and downlink with the OCU secured with **256** bit AES encryption **or higher standards**. The transmission must be digital. Frequencies utilised should not interfere with the communication equipment of the in-service tanks and ICVs & there should be no interference between drone & Loitering Munitions communication links.	Compliant/ Non Compliant	
	(b) Suitable communication equipment be provided for control of surveillance drone by RVT.	Compliant/ Non Compliant	
	(c) Anti jamming and anti-spoofing measures be incorporated in both system hardware and software.	Compliant/ Non Compliant	
23.	**Map**. A moving map to be provided in a resizable window with following facilities :-		
	(a) **DSM Compatibility**. The system should be compatible with Defence Series Maps (DSM).	Compliant/ Non Compliant	
	(b) There should be facilities to :-		
	(i) Annotate the map.	Compliant/ Non Compliant	
	(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-synchronies 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	
24.	**Training Simulator**. The training simulator should have following capabilities:-		

Ser No	Criteria and Sub Criteria	Vendor Response	Remarks (if Any)
	(a) Should comprise of separate instructor & student consoles.	Compliant/ Non Compliant	
	(b) The instructor console should be able to execute following actions :-		
	(i) Planning training mission.	Compliant/ Non Compliant	
	(ii) Setting tactical scenario.	Compliant/ Non Compliant	
	(iii) Define operational conditions.	Compliant/ Non Compliant	
	(iv) Setting up mission for students.	Compliant/ Non Compliant	
	(v) Observation of the mission executed by students.	Compliant/ Non Compliant	
	(vi) Assessment of student performance record.	Compliant/ Non Compliant	
	(vii) Maintenance of student performance record.	Compliant/ Non Compliant	
	(viii) Generate training report.	Compliant/ Non Compliant	
	(c) The student console should comprise of Command & Control Station, Communication Station & Launcher Station for Unmanned Aerial Vehicle (UAV) and Loitering Munition. It should be able to simulate activity starting from mission preparation to execution including abort & re-launch mission as per instructor's directions mentioned above.	Compliant/ Non Compliant	
	(d) The simulator's technical specification should be compatible with Defence Series Map.	Compliant/ Non Compliant	
	(e) The simulator should have projector to reflect actions at instructor & student consoles.	Compliant/ Non Compliant	
Maintainability & Ergonomic Parameters			
25.	The Integrated Surveillance and Targeting System for Mechanised Forces should have the following operational and maintainability characteristics:-		
	(a) It should comply to the environment parameters as laid down on Table 3-1 of JSS-55555 2012 Revision 3 standards.	Compliant/ Non Compliant	

Ser No	Criteria and Sub Criteria	Vendor Response	Remarks (if Any)
	(b) It should conform to Optoelectronic 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) **EMI/EMC Compliance**. EMI/EMC compliance testing will be carried out by ACE, Mhow. **Integrated Surveillance and Targeting System (ISAT-S)** and its sub systems/ sub-assemblies should be EMI/EMC compliant as under :-		
	(i) System/Platform/Ord level - As per MIL-STD-464C. (for Mil grade equipment)	Compliant/ Non Compliant	
	(ii) Sub systems level - As per MIL-STD-464E or better. (for Mil grade equipment)	Compliant/ Non Compliant	
	(iii) COTS systems/Sub systems - As per CISPR/IEC/FCC Standards (for commercial equipment)	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**.		
	(i) **Surveillance Drone**. The service life should not be less than 1000 landings for Drones, not less than 10 years for IT equipment and minimum 500 battery charging/ discharging cycles.	Compliant/ Non Compliant	
	(ii) **Loitering Munition**. 10 years or more.	Compliant/ Non Compliant	
DESIRABLE PARAMETERS			
26.	The Loitering Munition should be capable of engaging Armoured vehicles with a CEP of not more than 1 meter	**Credit Score Percentage** 2%	For information only, Compliance/ Non-Compliance not required to be furnished.
27.	The ISAT-S system should be capable of being launched from altitudes of upto 5500 mtr AMSL.	1%	
28.	Minimum Automatic Target Recognition (ATR) ranges for the Monochromatic Night Thermal Camera of surveillance drone should not be less than 800 mtr.	1%	
Total		**4%**	

Ser No	**Criteria and Sub Criteria**	**Vendor Response**	**Remarks (if Any)**
29.	**Compliance Certificate**		
	(a) Correctness Certificate (As per Appendix 'D')	Compliant/ Non Compliant	
	(b) Confidentiality Agreement (As per Appendix 'E')	Compliant/ Non Compliant	
	(c) EoI Compliance Certificate (As per Appendix 'F')	Compliant/ Non Compliant	

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 38 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 Integrated Surveillance and Targeting System (ISAT-S) for Mechanised Forces 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 34 of EoI)

CONFIDENTIALITY AGREEMENT

1. It is certified that Expression of Interest document for project of Integrated Surveillance and Targeting System (ISAT-S) for Mechanised Forces 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 27 of EoI)

EoI COMPLIANCE CERTIFICATE

It is certified that all the aspects mentioned in the Expression of Interest for the procurement of Integrated Surveillance and Targeting System (ISAT-S) for Mechanised Forces 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 24 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 Preceeding 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. **Indigenisation of Critical Technologies**. Following details to be provided :-

(a) List of critical technologies/ components to be sourced from foreign OEMs.

(b) Critical & Niche technologies planned to be indigenised alongwith Indigenisation status and plan.

18. Any other relevant information.

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