

**QUESTIONNAIRE FOR DESIGN & DEVELOPMENT OF
ANTI TANK INFLUENCE MINE (IMPROVED) AS MAKE II PROJECT**

Ser No	Aspects	Response by Prospective Development Agencies
1.	<u>Company Details.</u>	
	(a) The category of the company, whether Large/ Medium/ Small or Start Up/ DPSU/ CPSU.	
	(b) Years of existence/ Incorporation (Established in _____).	
	(c) Annual turnover of the Company in crore for last three financial years (FY). (i) FY 2020-21. (ii) FY 2021-22. (iii) FY 2022-23.	
	(d) The credit rating of the company and net worth in crore for last three financial years (FY). (i) FY 2020-21. (ii) FY 2021-22. (iii) FY 2022-23.	
	(e) Annual profit in the last three financial years in crore. (i) FY 2020-21. (ii) FY 2021-22. (iii) FY 2022-23.	
	(f) Is the company into any solvency/ in-solvency / litigation (s)/ NCLT appeal (s)?	
	(g) Is ownership Indian or Foreign or Joint Venture?	
	(h) The shareholding pattern of the company. (Indian and Foreign in percentage)	
	(j) Whether the company is OEM, manufacturing agency or system integrator.	
	(k) Experience of the company in related fields in years.	
	(l) Whether similar equipment has been supplied to any other government agency (Type of equipment, quantity, cost & year of supply).	
	(m) Whether company has patents/ IPR/ filed any patents (pending approval) related to Anti-Tank Influence Mine (Improved).	
	(n) Whether company has patents/ IPR/ filed any patents (pending approval) of any critical components/ sub-systems.	
	(o) Whether the company has any tie-ups/ Joint Ventures with any foreign firm for producing similar equipment.	
	(p) Details any back-end technology partners if any, to assist in this project.	
2.	<u>Infrastructure.</u>	
	(a) Does the company have adequate infrastructure to develop, integrate and manufacture? If not, what would be the procedure and timelines to establish the same?	
	(b) Does the company have adequate infrastructure for carrying out trials and testing of equipment?	

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	(c) Availability of explosive lab testing facility for checking the efficacy?	
3.	R&D. (a) Number of employees working in R&D of systems related to the product. (b) Whether company has produced any product for government agency? If yes, details of product with quantity, cost & year of supply be provided. (c) Any similar project or sub component which is presently being undertaken by the company R&D/D&D. (d) Scope of project & current status of development /trial of the project.	
4.	Cost. (a) Cost of the prototype development of one mine without taxes. (b) Total cost of 10,000 Numbers of equipment with the specified warranty without taxes. (c) Recommendations for AMC/CMC or to be maintained by the Army with adequate training. (d) In case of AMC/ CMC, yearly cost of maintenance in % of Total Cost without taxes. (e) Taxes in % (f) Quantity of prototype recommended for user trials as per your judicious assessment. (g) At this stage, exact Numbers of sample required for trials is difficult to arrive at, since it will be based on the vendors technology, composition /methodology. However, as a indicative figure from vendor side, cost of providing 50 Numbers, 100 Numbers & 150 Numbers prototype for trials to be provided for generic understating. (h) Likely life cycle cost of the system. (i) Minimum quantity economically viable for business.	
5.	Indigenous Content (IC). (a) Likely achievable indigenous content at prototype as well as at production stage in %. (b) Details of Indigenous Content of important sub-systems and enabling technologies. (c) Critical/ core technologies identified which are not likely to be available in India, to be sourced ex-import (in cost percentage terms). (d) Critical/ core technologies being indigenised or not being indigenised. (e) Sub-systems/ equipment manufactured by the company and details of outsourced equipment along with details of the manufacturer. (f) Details of Intellectual Property Rights (IPR). (g) Percentage of Use of military grade Indigenous components.	
6.	Time for Manufacture. (a) Likely time for development of the prototype (in weeks).	

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	(b) Manufacturing of the product (per year capability).	
7.	<p><u>Licences.</u></p> <p>(a) Any existing technology partnership/ applied for partnership with manufacturing companies?</p> <p>(b) Details of defence licence for manufacturing companies to be provided.</p>	
8.	<p><u>Explosive Licences.</u></p> <p>(a) Details of explosive licence for manufacturing companies to be provided.</p> <p>(b) Details of defence licence for manufacturing companies to be provided.</p> <p>(c) Any existing partnership/ applied for partnership with Explosives manufacturing companies?</p>	
9.	<p><u>Sustenance.</u></p> <p>(a) The ability of the company to sustain the product through the lifecycle of the equipment (including spares and upgrades).</p> <p>(b) How will you ensure continuous supply of spares especially for components procured ex-import?</p> <p>(c) How will continuous supply of spares be ensured from sub-contractors?</p> <p>(d) What measures would be taken to mitigate the effects of extreme cold climate on the equipment.</p> <p>(e) Are you willing to provide Engineering Support Plan (ESP) comprising of Manufacturer's Recommended List of Spares (MRLS), Special Maintenance Tools (SMTs), Special Test Equipment (STE), Test jigs and fixtures and Technical Literature.</p> <p>(f) If your willing to provide ESP then provide the recommended requirement of MRLS, SMTs, STE, Test jigs and fixtures and Technical Literature.</p> <p>(g) Warranty period of the product.</p> <p>(h) <u>Product support.</u> What is the period for which you will commit product support for sustenance of the system in terms of supply of spares/ Calibration etc?</p>	
10.	<p><u>Training.</u></p> <p>(a) What is the type and duration of training required for initial handling of the equipment? What is the type and duration of refresher training for subsequent handling?</p> <p>(b) Details of training/ operating manuals to be provided.</p> <p>(c) What are the training requirements for Maintenance personnel to be able to carry out Component Level Repair?</p> <p>(d) Is your entity willing to offer a comprehensive package for training of maintenance personnel to undertake repair and maintenance of equipment along with tools and test jigs as required?</p> <p>(e) Requirement of training of operators on existing system without going in for simulators.</p> <p>(f) Any practice mine/simulator that can be provided for the mine.</p>	

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	Details and cost of the same.	
	(g) Cost of training aids/suggestions such as cut out models, CBT etc.	
11.	Quality Certification.	
	(a) Details regarding quality certification like ISO 9000 etc, if so, details of date of certification with validity and certification agency.	
	(b) Measures and capability to meet environmental specification as per laid down norms.	
12.	Broad Concept/ Design. The proposed mine should be a reliable anti-tank mine with the capability to be remotely controlled with respect to multiple arming & disarming cycles. The mine should be intelligent enough to acquire a target based on magnetic, seismic, load and should be able to leverage Artificial Intelligence and Machine Learning for the same. The mine should be rugged enough to withstand the harsh operational environment as also the vagaries of inclement weather.	
	(a) Physical Characteristics of Mine.	
	(i) What are the physical dimensions of the mine?	
	(ii) What is minimum weight of the mine inclusive of explosives?	
	(iii) What is the colour of the mine? Can the mines be manufactured in different colour variants for different terrain as obtained in area of operations?	
	(iv) What is the likely effect of moisture/ water on the mine should the mine remain submerged for a duration up to but not exceeding 30 days?	
	(v) Can the mine be operational between minus 20°C to 55°C. What is the temperature range (minimum and maximum) and humidity which the mine is likely to withstand while deployed for ops and in storage?	
	(vi) What is the maximum number of times the mine can be handled safely?	
	(b) Laying/Arming & Disarming.	
	(i) Whether the mine can be laid mechanically and /or remotely other than manual methods? Is there any capability development on similar lines being planned for a later stage? In case its possible to lay mine by mechanical means, which equipment is proposed for mechanical mine laying. Is the mine designed in a manner so as to enable it to be laid through remotely delivered mine systems-as and when such a capability is developed?	
	(ii) Does the mine have any Unique Identification System which can be exploited to spatially locate the mine on coordinates so as to enable it to be remotely armed/disarmed/neutralised? What is the system to monitor each individual mine?	

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	(iii) What is the mechanism that is being used to arm/ disarm/ locate the mine? What is the likely impact on the adjacent mines should one particular mine be disarmed or neutralised?	
	(iv) Is there any technology presently available in the world to enable the adversary to counter this mechanism and use it to his advantage?	
	(v) What safety mechanism is being incorporated to prevent accidental activation of the mine? Any additional safety that has been incorporated during storage and transport?	
	(vi) What effect will multiple arming/ disarming and target selection will have on the efficacy of the functioning of the mine?	
	(vii) Does the mine have an arming delay of 60±5 minutes once it is physically armed? If not, what is the arming delay that can be achieved?	
	(c) Discrimination and Actuation.	
	(i) What is the technology and the concept being employed for the programmable target selection? Can the target selection be done dynamically?	
	(ii) What technology is being used to carry out selection of target? Details of technology (Magnetic/ seismic/ load/ leverage/ Artificial Intelligence and Machine Learning/ any other technology) to be provided?	
	(iii) How will the mine be able to discriminate between various vehicles? What is the A Vehicle, B Vehicle & tank trawl discrimination that can be achieved.	
	(iv) What is the envisaged effect of the activation of the mine on the various parts of the tank?	
	(d) Warhead.	
	(i) Is it a single charge or double charge system (clearing and main charge)? If single charge system, what is the concept of employment and how is it likely to carry out the basic function of the main charge as well as the clearing charge?	
	(ii) Will the mine on actuation underneath an armoured vehicle, achieve a total kill or mobility kill? What is the maximum penetration of Rolled Homogenous Armour (RHA) that can be achieved from the warhead?	
	(iii) What is the envisaged vertical standoff distance of the mine including the earth cover that will be required to test the armour penetration being achieved above?	
	(e) Fuse System	
	(i) What is the type of fuse to be used in the mine? What are the safety features incorporated to prevent accidental	

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	activation of the fuse?	
	(ii) What is the technology used to actuate the fuse on attempts being made to detect the same?	
	(iii) Does the mine have Tilt sensors and lift sensors. What is the angle it will actuate wrt the land mine? Is the tilt sensor programmable?	
	(iv) What is the maximum number of times the fuse can be handled?	
	(v) Is any self-neutralisation period being planned for the fuse? What are the settings for this self-neutralization period?	
	(vi) What is the type and quantum of explosive likely to be present in the fuse?	
	(vii) What is the maximum time in days in which the mine will be standby state after laying?	
	(viii) What is the maximum time in days that the mine will be in-active state post arming?	
	(f) Deactivation. Is the remote deactivation based on the Radio Frequency, Line of Sight? What anti-jamming capabilities are available with the operator to work through a jamming environment in the battle field?	
	(g) Ruggedness	
	(i) What is the packaging method to be used? What weight can the packaging boxes be able to withstand during transportation and storage?	
	(ii) Will the mine be able to withstand a drop as per JSG 0102 from a height of approx. 1.5 m? What other criteria and test standards have been incorporated to make the mine rugged?	
	(h) Shelf Life. Is there a requirement of special storage condition for mine/ mine components? If so give the temp/ humidity range. What is the shelf life of mine and batteries? Can the batteries be easily replaced in the field or in the storage depots? Does any other part of the mine have to be replaced during shelf life of the mine? If yes, can same be done in storage depots?	
13.	Other Aspects	
	(a) What is the likely miss distance (distance from the edge of the target beyond which the mine will not be actuated)?	
	(b) What is the range of the speed of tank between which the above can be achieved?	
	(c) What is the minimum standoff distance to prevent sympathetic detonation due to the blast from Anti-Personnel Blast Type Mines and Anti-Tank Mines? Specify the mine considered.	
	(d) What is the distance at which the unarmed mine will be insensitive to small arm fire? What is the maximum calibre of such small arms ammunition?	

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	(e) Does the mine have remote mine health monitoring and location tracking facility?	
	(f) The development agencies to provide supporting documents, if any, of the design parameters that are being provided for the equipment.	
	(f) Is there any special equipment required in field for upgrading the equipment/ mechanism of incorporation of AI in target selection?	
14.	EMI/EMC Compliance. Has the equipment/ system been tested for conformity to EMI/EMC compliance? Information as per Appendix attached be provided with technical literature to include system details connectivity diagram, list of cables and connectors of the system and internal test reports.	
15.	Assistance Required During Prototype Development	
	(a) Any requirement of access to firing range during prototype development phase. If yes, specify the duration of access required per day and total no of days.	
	(b) Any requirement of military equipment including mines during prototype development phase. If yes, specify the equipment and quantity required and period of requirement (in days).	

16. Any other information relevant to the project not included in the questionnaire may be forwarded. Separate sheets to be attached if, required.

17. The last date of response to the above questionnaires is 28 Jun 2023 for acceptance by this office.

18. **Contact Details.**

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Appx A
(Ref Para 14 of Questionnaire)

**EMI/EMC INFORMATION TO BE PROVIDED BY THE
VENDOR**

1. Has the equipment/product/ product family been tested for conformity to MIL-STD-461 (version E or later) at the sub system level. (Yes/No/NA).
 - (a) If yes, please give details of the tests conducted, copy of reports along with the date and name of the lab with accreditation certificate.
 - (b) If No, what other EMI/EMC standards does it comply to? How adherence to EMI/EMC standards was achieved at design/development stage? Provide details with justification.

2. Has the equipment /product/ product family been tested for conformity to MIL-STD-461 (version C or later) at the sub system level. (Yes/No/NA).
 - (a) If yes, please give details of the tests conducted, copy of reports along with the date and name of the lab with accreditation certificate.
 - (b) If No, what other EMI/EMC standards does it comply to? How adherence to EMI/EMC standards was achieved at design/development stage? Provide details with justification.

3. Has the equipment/product/product family been tested for conformity to HERO/HERE/HERP? (Yes/No/NA).
 - (a) If yes, please give details of the tests conducted, copy of reports along with the date and name of the lab with accreditation certificate. What is the classification for the same?
 - (b) If no, state valid reasons, thereof.

4. Is the equipment / product/product family been tested for conformity to EMP. If yes, please give details of the tests conducted, copy of reports along with the date and name of the lab with accreditation certificate.