

QUESTIONNAIRE FOR SHORE BASED GUIDED ROCKET (SB-GR)

Introduction. *IN* is examining the feasibility of inducting Shore Based Guided Rocket (SB-GR) under **MAKE-II category of DAP-2020**. Quantity required for prototype is one (01) SB-GR Battery and tentative total quantity required is 10 x SB-GR Batteries.

1. **Questionnaire.** The questionnaire is divided into following parts:-

- (a) Part A - Description of SB-GR
- (b) Part B - Instructions for filling up questionnaire.
- (c) Appendix A - Technical Questionnaire.
- (d) Appendix B - General Questionnaire
- (e) Appendix C - Vendor Information.
- (f) Appendix D - Statement of Costs.

2. The above information is being sought with no financial commitment and the Ministry of Defence reserves the right to change or vary any part thereof at any stage.

PART A- DESCRIPTION OF SB-GR

1. **Components.** Components of the SB-GR should include the following:-
 - (a) SB-GR Battery comprising Launcher Vehicle, Command Post, Loading Vehicle and Replenishment Vehicle.
 - (b) Rocket to comprise Guidance System, Warhead, Fuses and Propulsion System.
 - (c) Command Control and Communication (C³) system, capable of controlling battery of launchers. The Command Post is to have communication and data facilities compliant to /N's inventory.
 - (d) Equipment required to support deployment.
2. **Role.** The system is envisaged to be an Anti-Submarine weapon comprising multiple rocket launchers encased in a pod arrangement.
3. **Area of Operation.** The SB-GR should be capable of operations in coastal regions from prepared and unprepared areas/surfaces.

System Description

4. **System Specifications.** The SB-GR should possess the following general specifications: -
 - (a) **Design Parameters.**

(i) Range	Upto 150 km
(ii) Length of Rocket	Not greater than 5.5 m
(iii) Calibre	0.2 to 0.3 m
(iv) Pod Configuration	Not more than (L x W x H : 5.5 x 1.1 x 1.2 m)
(v) Pod Weight	Not more than 2800 kg
(vi) No. of Rockets/Pod	04

(vii)	No of Pods/vehicle	Not less than 02 (not less than 12 rockets)
(viii)	Propellant	Solid Composite/other Equivalent
(ix)	Launcher	Compatible with multiple launchers
(x)	Guidance	Aerial and/or underwater Guidance

5. **Azimuth Coverage.** Capable of attacking underwater target over 360° coverage at designed ranges.

6. **Speed.** The rocket is to operate in the supersonic range. The speed of the rocket carrier shall be maintained at least 3 Mach to ensure minimum latency while attacking target.

7. **Warhead.** The system shall have ASB class (PBHE or other equivalent) warhead capable of omnidirectional blast for neutralising enemy submarine. The rocket shall have shelf life of at least 15 years.

8. **Weight.** The rocket shall have a maximum weight of 350 ± 20 kg complete with associated equipment.

9. **Weather.** The weapon shall have an all-weather capability.

10. **Hit Probability.** The release of rocket at probable target location by the launcher with 90% reliability upto ranges of 40 Nm shall be achievable within the CEP of s; 40m. The target data (not limited to) would be based on external inputs.

11. **Salvo Launch.** Salvo launch capability shall be available in the system.

12. **Modes of Launch.** The SB-GR system should be capable of undertaking firings in following modes:-

(a) **Centralised Mode.** SB-GR system shall be capable of firing the rockets with onboard FCS in Command Post. The FCS shall be capable of receiving target data through C S using !N's communication system.

(b) - Manual Mode. Provision for manual input of target data parameters on FCS shall be available in the system.

13. Control Station. A Command Post with FCS for SB-GR onboard a rugged military vehicle. The communication protocols for Command Post shall be compatible with /N's communication system. The FCS of SB-GR shall be integrated with CMS to support launch of SB-GR. Command Post shall have facility of data transmission and reception via U/VHF, HF and SATCOM from MoCs. Command post shall have arrangement for manning by a minimum of four personnel.

PART 8- INSTRUCTION FOR FILLING UP QUESTIONNAIRE

1. Following documents are required to be submitted by respondents:-
 - (a) Appendix A.
 - (b) Appendix B.
 - (c) Appendix C.
 - (d) Appendix D
 - (e) Appendix E.

2. In case a proposed solution does not confirm to the limits as per questionnaire respondents may respond with recommended limit or proposed specifications. Further respondents are to justify the recommended limit.

3. The respondents shall submit one (01) copy of response, clearly marking one copy as 'Original Copy'. The respondents are also required to submit a soft copy of the response in a CD/ DVD in PDF and word format. In the event of any discrepancy between the content in copies of documents submitted, the contents in the 'original copy' shall govern/ prevail.

4. 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 may be added as the last column only or as a separate attachment.

5. All response appendices should be submitted in a single file or folder. Supporting documents or additional reference should be submitted in 3 separate folder with proper reference mentioned against each parameter or sub parameter in respective appendices.

6. Responses are to be addressed to following address

Project SB-GR
Directorate of Staff Requirements
IHQ MoD (Navy)
D Block
Defence Officers Complex
Africa Avenue
New Delhi - 110 023

APPENDIX A - TECHNICAL QUESTIONNAIRE

Ser	Specification/Parameters/ Information Required	Information About Proposed Solution
Dimensions		
1.	What is the length of the proposed pod and rocket? (Limit - Not more than 5.5 m)	
2.	What is the weight of the proposed pod system including payload? (Limit - Not more than 2800 kg)	
3.	What is the range of SB-GR Battery (in terms of mobility)? (Limit - at least 600 km)	
4.	What is the average power backup of SB-GR battery? (Limit - 5-35 Watt)	
5.	What is the power supply for SB-GR battery? (Limit - 3 phase, 415 V AC and 1 phase 220 V AC)	
Speed		
6.	What is the speed of the proposed SB-GR? (Limit - 3 Mach)	
Equipment Fit		
7.	What is the capability of the Launcher Vehicle? Please provide brief description and technical details	
8.	What is the capability of the Replenishment Vehicle? Please provide brief description and technical details	
9.	What is the capability of the Loading Vehicle? Please provide brief description and technical details	
10.	What is the capability of the Command Post? Please provide brief description and technical details	
11.	What are the characteristics of Guidance and Navigation System? Please provide brief description and technical details	
12.	What are the characteristics of Warhead? Please provide brief description and technical details	
13.	What are the characteristics of Fuse for warhead?	

Ser	Specification/Parameters/ Information Required	Information About Proposed Solution
	Please provide brief description and technical details	
14.	What is the propulsion system for rocket?	
	Please provide brief description and technical details	
15.	What are the specifications of Pod System?	
	Please provide brief description and technical details	
16.	What are the specification of vehicle for SB-GR battery?	
	Please provide brief description and technical details	
17.	Feasibility of utilising in-service vehicle for Launcher Vehicle, Command Vehicle, loading Vehicle as well as Replenishment Vehicle.	
18.	Which Line of Sight Communication system would be fitted in the SB-GR Battery?	
	Please provide brief description and technical details	
19.	Which Secure Data Recorder would be fitted on the SB-GR Command Post?	
	Please provide brief description and technical details	
20.	How will the algorithm for interface between communication system on SB-GR Command Post and existing systems in IN be implemented?	
	Please provide brief description and technical details	
21.	How will the interfacing between CMS and SB-GR Command Post be implemented?	
	Please provide brief description and technical details	
Ammunition		
22.	What is the type of warhead for rockets?	
	Please provide brief description	
23.	What is the caliber of rocket? -	
	Please provide brief description	
24.	What is the type of propellant for rockets?	
	Please provide brief description	
12s.	What is the range of rockets (max and min)?	

Ser	Specification/Parameters/ Information Required	Information About Proposed Solution
	Please provide brief description	
26.	What are the types of rocket to be developed? Please provide brief description and technical details	
27.	What is the envisaged CEP for rockets? Please provide brief description	
28.	What is the storage requirements of rockets? Please provide brief description	
29.	What is the shelf life of fuse?	
30.	What are the different types of explosive components fitted inside the rocket of SB-GR? Please provide technical details.	
31.	What are the baseline parameters of explosive components as part of acceptance? Please provide details.	
32.	What kind of support is envisaged from vendor post completion of shelf life of ammunition? Please provide details.	
Technical Systems		
33.	How is the power generation, distribution and management system implemented on the SB-GR Battery. Provide operational and technical details	
34.	What is the envisaged backup for power generation, distribution and management system implemented on the SB-GR Battery? Provide operational and technical details	
35.	What is the type of BITE system on SB-GR Battery? Provide operational and technical details	
36.	What is the type of Fire Fighting system envisaged on SB-GR Battery? Provide operational and technical details	
37.	What are the safety systems envisaged in SB-GR Battery	

Ser	Specification/Parameters/ Information Required	Information About Proposed Solution
	Provide operational and technical details	
38.	What is the envisaged reaction time for SB-GR Battery and its sub-systems? Please provide brief description	
Command and Control		
39.	Give a brief description of how following modes of operation would be implemented on the SB-GR Battery:- (a) Centralised. (b) Manual.	
Control Station		
40.	What are the dimensions of control station?	
41.	What all is envisaged to be fitted on control station? eg AC, SATCOM antenna etc?	
Quality Assurance		
42.	Which are the recommended Environmental Conditions and standards for testing?	
43.	What standards will be employed for software quality assurance?	
44.	What standards would be employed for EMI/EMC checks?	
45.	What are the recommended Environmental Stress Screening Tests (ESS).	
46.	How would the Configuration Management (CM) be executed?	
47.	What are the specifications of the SB-GR being followed with respect to:- (a) Design of equipment. (b) Reliability of equipment. (c) Ergonomics of equipment. (d) Environmental test specifications. (e) Shock test specifications. (f) Vibration test. (g) Corrosion resistance. (h) User documentation.	

Ser	Specification/Parameters/ Information Required	Information About Proposed Solution
48.	<p>What are the specifications of the SB-GR being followed with respect to: -</p> <p>(a) What grade of material will be utilised for component/ sub-assembly (Mil/Marinised / Industrial etc) of Launcher Vehicle, Command Post and Communication System.</p> <p>(b) What grade of cable/internal wiring will be used?</p> <p>(c) What type of cable entry gland will be used and which specification will be followed for testing?</p> <p>(d) What types of surface protection schemes/paint schemes will be utilized?</p> <p>What redundancy for critical systems will be deployed?</p>	
Product Support and Maintenance		
49.	Can you provide a separate standalone simulator for training? If yes, what is the approximate cost of the simulator?	
50.	What are the capabilities of the simulator?	
51.	How many trainee and instructor nodes are included in one simulator package?	
52.	What are the envisaged facilities for product support of the SB-GR?	
53.	What are the envisaged infrastructure requirements of the SB-GR?	
54.	Are you willing to set up repair facilities in India or would the repair facilities be provided through an authorised service representative (if applicable)?	
55.	What is the operational life of the SB-GR?	
56.	What are the warranty conditions of the SB-GR? How long would it be valid? (hardware as well as software warranty)	
57.	To ensure Repair and Maintenance support, what is the proposed methodology for 'Operator (O)' Intermediate (I)' and 'Depot (D)' Level repairs and maintenance'.	

Ser	Specification/Parameters/ Information Required	Information About Proposed Solution
58.	What is the preferred mode of Repair and Maintenance support - Engineering Support Package, Comprehensive Annual Maintenance Contract (including spares) (CAMC) , Annual Maintenance Contracts (AMC) or Rate Repair Contracts (RRC)?	
59.	For how many years would support in terms of maintenance/ availability of spares be provided	
60.	What is the Mean Time Between Failure (MTBF) for the system?	
61.	What is the maximum duration the system can be operated continuously?	
62.	What is the type and depth of documentation that would be offered for training, operation and maintenance of the SB-GR?	
63.	Is your company the OEM or authorised vendor of the equipment?	
64.	Indicate whether the equipment has been supplied by vendor to any other country and details thereof. (The differences between these versions of equipment and the equipment presently being offered may also be highlighted)	
65.	Indicate if the equipment has been offered to any other Governmental agencies within India and if so, unit price (without taxes/ custom duties) and year in which it was supplied.	
66.	Indicate tentative delivery schedule for supply of the equipment after conclusion of contract.	
67.	If not OEM, provide details of MoU with foreign OEM or proof of partnership.	
68.	Turnover of your company for three financial years.	
69.	Other naval equipment being manufactured by your company?	
70.	Other naval equipment supplied by your company to the Indian Navy/ Indian Coast Guard?	
71.	(In case of foreign OEM) Is the foreign OEM willing to partner with an Indian firm for License production of the equipment in India? If yes, name of firm and exact scope license production?	

Ser	Specification/Parameters/ Information Required	Information About Proposed Solution
72.	(In case of foreign OEM) Is the foreign OEM willing to Transfer of Technology of the equipment to an Indian firm? If yes, please elaborate upon exact scope of ToT.	
73.	Are you willing for Single Stage Composite trials of the equipment in India on a No Cost No Commitment basis?	

APPENDIX B- GENERAL QUESTIONNAIRE

- Q1. What are the planned equipment for exploiting SB-GR from shore?
- Q2. Broadly describe the envisaged Control Station of the SB-GR and capabilities.
- Q3. The Control Station is required to have the capability to transfer raw and processed data to the existing Data Centre of IN. Interface details would be shared by IN during development phase. The feasibility of the same may be commented upon.
- Q4. Interface for data reception and transmission is a critical aspect to be incorporated in the SB-GR. Description of the data reception and transmission and details of testing undertaken/planned be elaborated.
- Q5. Comment upon the redundancy aspects of mission critical modules/subsystems to obviate mission failure due to a single point failure.
- Q6. What is the manpower required to operate the Battery in various configurations (including remote mode), including operations at sea/shore?
- Q7. How and where are the prototype trials proposed to be undertaken?
- Q8. What is the envisaged service life of the SB-GR? Is there a requirement of major maintenance/overhaul of the vehicles and pods during their service life?
- Q9. What arrangements (lifting appliances, stowage, launch cradle etc) are envisaged/ required for shipping from IN ships? Deliverables that would be provided by the vendor to be highlighted.
- Q10. What arrangements (lifting appliances, stowage, launch cradle etc) are envisaged/required for operating from coastal areas? Deliverables that would be provided by the vendor to be highlighted.
- Q11. What are the envisaged arrangements/conditions for stowage of the SB-GR when not in use?

Q12. State the reliability and maintainability model and indicate percentage reparability of the system.

Q13. The feasibility of undertaking repairs by *IN* for general mechanical, electrical and electronic components be commented upon.

Q14. Are the vehicles/ components being built according to class specifications of a particular class?

Q15. What would be the likely cost of comprehensive AMC (AMC with spares) in terms of percentage of the cost of procurement?

Q16. What Quality Assurance (QA) methodologies are proposed to be deployed by the vendor during design, development, production and trial phases to ensure delivery of a completely reliable and fail safe operational platform?

Q17. What testing strategy is proposed to be used by the vendor to check the reliable operations of SB-GR?

Q18. A platform/system-centric QA approach is necessary for SB-GR. In view of the same, vendor may specify which of the global best practices in QA methodology for design and development of Autonomous vehicle and Robotic systems are proposed to be incorporated and how would the same be proven by the vendor? QA requirements/standards envisaged for various tests/checks .in respect of items/components/assemblies/sub-assemblies/systems _etc_ be brought out for the following: -

- (a) Qualification tests - Environmental and EMI/EMC tests.
- (b) Shock Test - when operating below waterline as well as above waterline.
- (c) Environmental Stress Screening (ESS).
- (d) Tests/ checks for the following to be mentioned: -
 - (i) Electrical checks and safety specifications.
 - (ii) Switches and cables.

- (iii) Connectors and LED/LCD.
- (iv) Soldered Electronic and Electrical assemblies.
- (v) Burn-in/ Endurance tests.

Q19. Vendor to bring out what special training/courses and skills will be required by *IN* personnel to undertake repairs (both hardware and software based).

Q20. Please list out what equipment fit on the SB-GR would be military grade and what would be commercial grade?

Q21. Please provide any other recommended quality standards for equipment fitted on the SB-GR (only if equipment is not military grade).

Q22. How will the vendor carry out certification/demonstration of the various standards proposed by the vendor?

Q23. What are the likely timeline for undertaking Design and Development of the SB-GR? Please indicate major milestones of the timeline in following format.

Ser	Timeline (T ₀ = Placement of <u>PSQ</u>)	Milestone
(a)	To+ weeks	

Q24. What is the likely timeline for providing deliveries of the system? Please indicate proposed delivery timeline in following format.

Ser	Timeline (T ₀ = Placement of <u>Contract</u>)	No of <u>CASCADE-ASV</u>
(a)	To+ weeks	

'Are you willing for Single Stage composite Trials of the equipment in India on a No Cost No Commitment basis? -

Q1. Indicate Name, Address and Unique ID (if any) of the Vendor/ Company/ Firm.

Q2. Furnish complete postal address, details of local office/ liaison office in Delhi area (if any)/ in vicinity. Details of single Point of Contact (PoC) for clarification of queries, if any.

Q3. The following details to be provided (relevant documents to be forwarded):-

- (a) Category of Industry (Large/ Medium/ Small Scale).
- (b) Annual Turnover in INR for last 03 financial years.
- (c) DPIIT certificate if startup.
- (d) Profit/ Loss Statement of the last 03 financial years.
- (e) Number of employees in firm.
- (f) Details of manufacturing infrastructure that would be useful for manufacturing the SB-GR and its subsystems.
- (g) Production capacity per annum.
- (h) Details of earlier contracts with Indian Ministry of Defence/ Government agencies:-

Contract Number	Equipment	Quantity	Cost

Q4. Does the firm hold any certification by Quality Assurance Organisation? If yes, the following details to be furnished: -

Name of Agency	Certification	Applicable from (Date & Year)	Valid till (Date & Year)

QS. Does the vendor hold membership of FICCI/ ASSOCHAM or other industrial association? If so, name of the organisation, Membership Number and relevant certification to be provided.

Q6. Elaborate in detail upon the capability to indigenously design and develop the required equipment along with justification and documentary evidence. The following are to be specified: -

- (a) Is the design of the equipment and its software Indigenous?
- (b) Details of components that are envisaged to be imported and from where?
- (c) Also indicate willingness to share the Intellectual Property Rights (IPR) of the design.

Q7. What are the technologies currently available with the vendor that would be harnessed towards manufacturing of the SB-GR and its associated subsystems and the extent of their availability or accessibility in case they are not available in India?

QB. Is collaboration with one or more foreign/Indian firms envisaged to design and develop the system? If so, indicate the scope of collaboration and details of ToT envisaged.

Q9. Does the vendor have adequate infrastructure to develop, integrate, test and manufacture SB-GR? If yes, provide details of the same. If no, what would be the timeframe for establishing the same?

Q10. What are the anticipated timelines for development of prototype post award of Project Sanction Order and production thereafter (specify timelines separately for each)? Indicate willingness to progress the prototype development under Make II and subsequent procurement under Buy (Indian IDDM) Scheme of DAP-2020.

Q11. What are the areas of uncertainty envisaged by the vendor in the design, development and production of the indigenous development of SB-GR?

Q12. Indicate the overall level of indigenisation in the base vehicle and individually for the payloads that is envisaged to be achieved. Approximate breakdown of IC content (in percentage) for each of the sub systems is also to be provided. The procurement would eventually be under Buy {Indian-

IDDM), hence, the willingness to meet overall IC content of 50% as per DAP-20, may be confirmed.

Q13. Will the proposing company/ vendor also be manufacturing the production grade system? If not, what is the plan for production of the system post design and development?

Q14. -Does the vendor have the ability to provide product support for complete life cycle of SB-GR?

Q15. What Kind of support would be required for testing the equipment of SB-GR?

Q16. What kind of consort requirements are envisaged for testing the SB-GR?

Q17. Any other details which the vendor would like to bring before the Feasibility Study may be provided.

Q18. *Indicate* whether the equipment has been supplied by vendor to any other country and details thereof. (The differences between these versions of equipment and the equipment presently being offered may also be highlighted)

Q19. *Are you partner with an Indian firm for License production of the equipment in India? If yes, name of firm and exact scope license production? Is the OEM willing to provide IPR (in case ToT with foreign OEM)?*

Q20. *Please provide details of other equipment that is being designed and developed by your company for Navy/Coast Guard/ Airforce or Army.*

Q21. *If the proposal is being forwarded as a consortium or AoP please provided details of all the participants and who will be the lead agency? In such a case who will be the final production partner? What is the likely workshare envisaged between all agencies.*

APPENDIX D - STATEMENT OF COST OF PROTOTYPE DEVELOPMENT

Ser	Items	Qty	Imported components cost (i)	Indigenous components cost (ii)	Approximate Unit Cost in Rupees (i)+(ii)	Any other details Please mention specific IC content that will be achieved
A.	Cost of fully formed Basic SB-GR	1				
B.	Land based Control Station	1				
C.	Cost of any special maintenance Tools or special test equipment	1				
D.	Project Monitoring and Admin costs	-				
E.	Cost of ToT if any	-				
F.	Any Other Costs (<i>please specify head</i>)					
	<i>Mission payloads (Add mission payloads as per proposal of the firm)</i>					
G.						
H.						
		Total				

STATEMENT OF COST FOR PRODUCTION GRADE VERSION (QUANTITY REQUIRED - 10 BATTERIES*)

Ser	Item	Qty	Imported Components Cost (i)	Indigenous components Cost (ii)	Approximate Unit Cost in Rupees (i)+(ii)	Any Other Details
A.	Cost of Basic SB-GR					
B.	Land Based Control Station					
	Mission payloads (<u>please</u>					
C.	Add mission 12a'i_loads as 2.er 2.ro12osal ot Orm)					
D.	Any other recommended payloads					
	Cost of Comprehensive					
E.	AMC(AMC with spares) for 05 years					
F.	Cost of Docum.entation					
	Cost training by OEM for operators and maintainer's					
G.	Cost of Special					
H.	Maintenance tools and special maintenance					
L.	Equipment					

I.	Cost of installation , Setting to work, HATs and SATs					
J.	Cost of integration with CMS					
K.	Any other costs					
Total						

* **Note:** The quantity indicated for production is only an indicative requirement and is not a firm commitment. The quantity has been provided so as to enable firms to arrive at economy of scale prior providing statement of cost of production. SB-GR.