

**EXPRESSION OF INTEREST (EoI) FOR PROCUREMENT OF
125mm APFSDS AMMUNITION WITH MINIMUM DEPTH OF PENETRATION
(DoP) OF 530mm FOR TANK T-72 & T-90**

References : Chapter III-A of DPP 2016.

Appendices :

Appendix A : Appreciated Timelines & Milestones for 125mm APFSDS Ammunition with minimum DoP of 530mm for Tank T-72 & T-90 at 60° angle of attack at 2000 mtr.

Appendix B : Preliminary Service Qualitative Requirements (PSQR) for 125mm APFSDS Ammunition with minimum DoP of 530mm for Tank T-72 & T-90 at 60° angle of attack at 2000 mtr.

Appendix C : Commercial Evaluation Criteria.

Appendix D : Technical Evaluation Criteria.

Appendix E : Information Proforma.

Appendix F : Confidentiality Agreement.

Appendix G : Correctness Certificate.

Annexure (s): Technical Evaluation Compliance Matrix (**Annexure 'I' to Appendix 'D'**)

Introduction

1. The armour protection on the adversary's tanks is gradually increasing, which requires higher penetration capability to defeat. There is a requirement to indigenously develop an improved 125mm APFSDS ammunition for Tk T-72/T-90. The ammunition should be **capable of achieving minimum DoP of 530mm (RHAe) at 60° angle of attack at 2000 mtr, to be fired from the existing Gun barrel**, in order to enhance the lethality should be within the existing 'safety', 'consistency' and 'shelf life' criteria.

Objective

2. The objective of this invitation of Expression of Interest (EoI) is to **seek responses from eligible Indian vendors for development of prototype and further procurement of the 125mm APFSDS ammunition with minimum DoP of 530mm for tank T-72 & T-90.**

Layout

3. The EoI has been covered under the 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 Aspects.

4. The nodal officer for this project for all queries/clarifications/coordination will be **Secretary, Project Facilitation Team (PFT)**. Address and contact details of the nodal officer are given at Paragraph 30 of the EoI.

PART I : GENERAL INFORMATION

5. **Categorisation.** The project is categorised as under: -

- (a) **Prototype Development Phase.** Sub-category '**Make'-II (Industry Funded)**' as per Chapter III-A of DPP-2016.
- (b) **Procurement Phase.** **Buy (Indian - IDDM)** as per Para 20 of Chapter III-A of DPP 2016.

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

- (a) **Prototype Development Phase.** Upto 250 rounds each for T-72 and T-90 platform to be provided by the shortlisted DA/DAs.
- (b) **Procurement Phase.** 85,000 (eighty five thousand) rounds of 125mm APFSDS ammunition.

7. **Appreciated Timelines & Milestones.** Appreciated timelines & milestones for the project are given at **Appendix 'A'**.

PART II : SCOPE OF THE PROJECT

Proposal for 125mm APFSDS with minimum DoP of 530mm for Tank T-72/T-90

8. 125mm APFSDS ammunition is the primary tank ammunition, utilised for destruction of enemy tanks. The advent of superior protection technologies now available globally, resulting in improved protection levels of Armoured Fighting Vehicles (AFVs), including those of our likely adversaries, can defeat the penetration capability of current Anti-Tank Ammunition. The aspect of DoP, which defines the terminal effects of the ammunition, is a major consideration to defeat the enhanced protection levels of AFVs. The present in-service ammunition has a DoP of 460mm. Therefore, there is a requirement to indigenously develop an improved APFSDS Ammunition for Tank T-72/T-90 with minimum DoP of 530mm, in order to **enhance the lethality, within the existing 'safety', 'consistency', and 'shelf life' criteria. This ammunition is required to be fired from the existing 125mm smooth bore barrels, presently fitted on tanks T-72 and T-90, duly integrated with the present gun systems and fire control systems.**

9. **Preliminary Service Qualitative Requirements (PSQR) of the Proposed Ammunition.** PSQR of the 125mm APFSDS with minimum DoP of 530mm for Tank T-72/T-90 is attached as **Appendix 'B'**.

Timelines and Critical Activities

10. Stages of the development and procurement process will be as per Chapter III-A of DPP-2016.

11. Major critical activities in the procurement process are as given below: -

<u>S No</u>	<u>Activity</u>	<u>Remarks</u>
(a)	Pre Expression of Interest (Eol) Response Meeting.	3 Weeks (tentative) after the issue of Eol, to clarify the issues/ queries raised by participating firms to facilitate submission of Eol response.
(b)	Evaluation of Eol Responses.	By Project Facilitation Team (PFT).
(c)	Issue of 'Project Sanction Order' for development of prototype.	To shortlisted Development Agencies (DAs), meeting evaluation criteria.
(d)	User Trial Readiness Review.	(a) To confirm completion of design & development of prototypes as per PSQR, prior to commencement of User Trials. (b) More than one review may be conducted, on required basis. Dates will be promulgated by the PFT, as per progress of the project.
(e)	Solicitation of Commercial Offers.	Commercial RFP for 'Buy (Indian-IDDMM)' phase will be issued to all Development Agencies (DAs) for submission of their commercial offer, prior to commencement of User trials.
(f)	Conduct of User Trials and GS Evaluation.	To validate the performance of the ammunition against the specifications approved after the development of prototype.

Development of Prototype and Trials

12. The composition and design of the 125mm APFSDS ammunition with minimum DoP of 530mm at 60° angle of attack at 2000 mtrs, to meet the PSQR will be decided by respective Development Agencies (DAs) in conformity with Para 12 above. Any clarification related to functional or operational aspects of the ammunition under development, as sought by the DAs, will be provided by the Project Facilitation Team (PFT).

13. After the prototype has been developed as per PSQR given at Appendix 'B', the PFT will carry out User Trial Readiness Review of the prototype(s) and freezing of technical specifications, before conduct of User trials. Evaluation of the ammunition will be carried out during the User trials, to validate the performance of the ammunition against the final technical specifications. **The SHQ will formulate the 'Trial Directive' which will address all issues for validating the 'Essential Parameters'**. Necessary technical literature pertaining to the design & material will be provided by the DAs for the User trial readiness review and conduct of User trials on the prototype.

Solicitation of Commercial Offers

14. A commercial Request for Proposal (RFP) for 'Buy (Indian-IDDM)' phase would be issued to DA(s) prior to commencement of User trials for soliciting their commercial offers and additional technical information/ documentation, as may be necessary.

Deliverables

15. The deliverables are as under: -

- (a) **Prototype Development Phase.** Upto 250 rounds each for T-72 and T-90 platform to be provided by the shortlisted DA/DAs.
- (b) **Procurement Phase.** 85,000 (eighty five thousand) rounds of 125mm APFSDS ammunition.
- (c) **Packaging**
 - (i) Composite packaging for projectile and cartridge case in same package.
 - (ii) Suitable markings on boxes.
 - (iii) The ammunition boxes should be provided with adequate facility for carriage.
 - (iv) The boxes should be hermetically sealed in rust proof containers. Advanced quality of seals/liners to be used to make the container air tight.
 - (v) Palletisation of the ammunition to be provided.
- (d) Opening keys/spanners/accessories as applicable for opening of boxes and transportation.

List of Trials/facilities to be provided

16. The following trials/facilities will be provided : -

- (a) **Trials.** The trials will be conducted in two stages: -
 - (i) **Stage – I : User Assisted Technical Trials (UATT)/PSQR Trial.** On completion of developmental trials, UATT will be conducted to evaluate the prototype against the ratified PSQR.
 - (ii) **Stage – II : User/GSQR Trials.** Once the PSQR is converted to GSQR the user trial including evaluation by DGQA will be conducted.

(b) **Safety Certificate.** Manufacture will give a safety certificate before the commencement of trials. Stating the following : -

“125mm APFSDS ammunition being offered to the Army for trials has been validated during Internal Validation Trials by manufacturer for safety. All the safety parameters are well within the design parameters, and this ammunition is safe for firing by the Trial Crew”.

(c) **Facilities Provided.**

(i) **Trials Tanks.** 02 x tanks each of T-72 and T-90 with barrels in first quarter of life for user trial and facilities at PXE Balasore to meet functional and safety requirements as per **Gol, Ministry of Defence vide letter No 18(2)/15/GTF/DP(Plg-MS) dated 28 August 2019.** A fitness certificate will be submitted by the DAs on maintainability of tanks.

(ii) **Trial Crew.** Crew on the trials tanks will be provided. Necessary training on the indigenous ammunition for the crew by the DAs will be conducted. A crew training certificate will be submitted by the DAs on the training standard of the crew.

(iii) **Allotment of Ranges.** Allotment and utilisation of ranges will be as per Guidelines issued by Gol, Ministry of Defence vide letter No 18(2)/15/GTF/DP (Plg-MS) dated 28 August 2019 and Standard Operating Procedures dated 05 September 2019. In case of any damage occurs to **equipment/property personnel resulting from the testing of the job 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.

(iv) **Repair, Recovery and Maintenance Facility.** Necessary repair cover will be provided.

Multiple Technological Solutions

17. Multiple technological solutions for the Project 125mm APFSDS with minimum DoP of 530mm for tank T-72/T90 at 60° angle of attack at 2000 mtr **will be accepted as per Para 40 of Chapter-III A of DPP 2016.**

Intellectual Property Rights (IPRs)

18. Policy on IPRs is, as given at Paragraph 42 of Chapter III-A of DPP-2016. The vendor will submit an **IPR certificate** stating that the **“Design of the equipment is the property of the vendor”**.

PART III : EVALUATION CRITERIA

Commercial Evaluation Criteria

19. The Indian entity meeting the criteria given at Annexure I of Chapter III-A of DPP-2016 will be considered as an eligible “Indian Vendor” for the project. EoI respondents will furnish their response to the Commercial Evaluation Criteria, as per **Appendix ‘C’**.

Technical Evaluation Criteria

20. The respondents to this EoI are required to furnish information about their Technical Capability as per **Appendix ‘D’**. Compliance/ information as per **Annexure I to Appendix ‘D’** is also required to be submitted as per the proposed solution offered by the DA against PSQR of the ammunition.

21. **Indigenous Content**. Post successful development of prototype(s), further procurement will be as per the ‘Buy (Indian-IDDMM) procedure with **Indigenous Content as per DPP-2016**.

22. **Foreign Collaboration**. If the DA 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 (refer Paragraphs 12 & 13 of **Appendix ‘E’**).

23. **Additional Information**. Additional information required to be furnished as part of the EoI response is also given at Para 17 of **Appendix ‘E’**.

Guidelines on Evaluation Criteria for Vendors

24. In case ammunition offered by the DAs meets the desirable parameters/EPP, the total cost of the price bid format will be multiplied by a credit factor based on the technical score assigned. Following credit score for desirable parameters will be awarded: -

<u>S No</u>	<u>Desirable Parameters</u>	<u>Credit Score</u>	<u>Commercial Quote</u>
(a)	DoP of 550mm	Up to 3%	<u>For L1 determination</u> Cost (X) multiplied by Credit factor of 0.97.
(b)	DoP of 540mm	Up to 1.5%	<u>For L1 determination</u> Cost (X) multiplied by Credit factor of 0.98.5.
(c)	1.5 EFC	Up to 2%	<u>For L1 determination</u> Cost (X) multiplied by Credit factor of 0.98.
(d)	1.7 EFC	Up to 1%	<u>For L1 determination</u> Cost (X) multiplied by Credit factor of 0.99.

25. **Modalities for Evaluation of Vendors**. The following criteria will be applied: -

(a) Since DoP is the most critical parameter, for combat effectiveness, **this parameter will be graded higher comparative weightage, over the EFC.**

(b) **Evaluation of Desirable/Enhanced Performance Parameters (EPP).** Each of the EPP will be evaluated independently for each of the vendors. **In case the resultant cost offered by the two vendors is similar/identical, and they emerge equal in evaluation, despite getting credits for different EPP (one vendor derives EPP credits for DoP and the other for EFC), the primacy of DoP as a premier operational parameter, will be retained and upheld.**

(c) In case the vendor meets both the desirable parameters ie DoP and EFC, the **credit points for both the parameters will be counted for evaluation.**

(d) **Parameter : DoP.** DoP will be allotted specified credits for 10mm and 20mm higher than the DoP specified in essential parameters (530mm) i.e 1.5% credit score will be allotted to the vendor for successfully achieving an increase in DoP of 10mm (540mm) and 3% credit score for achieving an increase in DoP of 20mm (550mm). This implies that on successfully achieving an increase in DoP from 530mm (essential parameter) to **550mm (desirable parameter), the vendor will be allotted maximum credit score of 3%.**

(e) **Parameter : EFC.** EFC will be allotted marks for 0.2mm and 0.4mm lesser than EFC specified in essential parameters (1.9) i.e 1% credit point will be allotted to the vendor for successfully achieving a decrease in EFC to 1.7 and 2% credit score of achieving decrease in EFC to 1.5. This implies that, on successfully achieving a reduced EFC from 1.9 (essential parameter) to **1.5 (desirable parameter), the vendor will be allotted maximum credit score of 2%.**

PART IV : PROCEDURE FOR SUBMISSION OF RESPONSE TO THE EoI

26. The response to the EoI shall be submitted as per formats given at **Appendices 'C', 'D' & 'E'.**

27. **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.

(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 references mentioned against each parameter/ sub parameter, in respective appendices.

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

28. **Rejection Criteria for the Responses.** The following may lead to rejection of the EoI response:-

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

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

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

29. The Eol respondent shall submit three (03) copies of response to the Eol, 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 Eol in a CD/ DVD.

30. The envelopes shall be addressed as under:-

Secretary, Project Facilitation Team
'125mm APFSDS Ammunition with minimum DoP of 530mm
for Tank T-72 & T-90'
 General Staff Branch
 Directorate General of Mechanised Forces
 Integrated HQ of MoD (Army)
 Room Number 33
 'G' Block, DHQ PO, New Delhi-110011
 Tele : 011-23792971, **Email : diriseact.72@gov.in**

31. The response to this Eol must be submitted by **1500 hours on 17 Feb 2020** at the address mentioned above.

32. 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 Eol respondent at the time of submission of Eol responses, as per format given at **Appendix 'F'**.

PART V : MISCELLANEOUS ASPECTS

33. **Pre Eol Response Meeting**. Companies may submit written queries/clarifications/ amplifications on specific issues within three weeks of the issue of Eol. A pre-response meeting will be held within 3 Weeks (tentative) after the issue of Eol, to clarify the issue/ queries raised by the participating firms to facilitate submission of response. Date of pre-response meeting will be promulgated by the PFT.

34. Guidelines for penalties in business dealings with entities as promulgated by the Government of India, from time to time, will be applicable on procurement process and bidders.

35. The Pre-Contract Integrity Pact (PCIP), listed as detailed in Paragraph 92 of Chapter II of DPP 2016, shall apply mutatis mutandis, to 'Buy (Indian-IDDm)' phase of 'Make' project.

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

Appendix 'A'
(Refer Para 7 of Eol)

**APPRECIATED TIMELINES & MILESTONES FOR MAKE-II PROJ “125MM
APFSDS AMMUNITION WITH MINIMUM DEPTH OF PENETRATION (DoP) OF
530MM FOR TANK T-72 & T-90”**

<u>Sr. No</u>	<u>Milestones/Activity</u>	<u>Time in weeks from collegiate discussions (T₀)</u>
1.	Categorisation and Accord of AoN	T ₀
2.	Issue of Eol	8
3.	Eol Response Submission	6
4.	Eol Response Evaluation	5
5.	Issue of Project Sanction Order	2
6.	Design & Development of Prototype	75 - 123 (As per Feasibility Study)
7.	Conversion of PSQR to SQRs/ Solicitation of Commercial Offer	4
8.	User Trials & Staff Evaluation	8-26
	Total	108-174 weeks

Appendix 'B'

(Refer Para 9 of Eol)

PRELIMINARY STAFF QUALITATIVE REQUIREMENT (PSQR) FOR 125MM APFSDS (ARMOUR-PIERCING FIN STABILISED DISCARDING-SABOT) AMMUNITION WITH MINIMUM DEPTH OF PENETRATION WITH (DoP) OF 530MM FOR T-72/ T-90 TANK**PART I - ESSENTIAL CHARACTERISTICS****Physical Characteristics**

01. The physical characteristics are as under:-

<u>Parameters</u>	<u>Specifications</u>
Bore	Should be capable of being fired from the existing 125mm 2A46 (T-72) & 2A46M (T-90) barrels.
Ballistics	The Ammunition Ballistics and properties should conform to Gun Barrel Design and must be compatible with existing Fire Control System (FCS) of T-72/T-90 tanks. The integration of ballistic data with existing ballistic computers to exploit the ammunition with existing Sighting System & FCS.
Size & Shape	The ammunition must conform to the existing barrel designs and designated spaces within fighting compartment (including Rotary Conveyor). The round must be two piece ammunition as per the existing design for T-72 & T-90 tanks. The ammunition must allow stowage by Auto Loader, and within the existing space.
Handling In Field	The ammunition should be robust enough and capable of withstanding varied terrain and temperature conditions as per Military Standards laid down in JSG 0102 for inspection and safety.
Operational Functionality	The ammunition should not obstruct or restrict the existing functionality of the tank/system & sub system or its operational employment.
Packaging	(a) Composite packaging for projectile and cartridge case in same package. (b) Suitable markings on boxes for ease of handling and identification in the dark and in storage/ stacking at ammunition dumps. (c) The ammunition boxes should be provided with adequate facility for carriage to be handled by two crew members in compliance with explosives safety standards. (d) The boxes should be hermetically sealed in rust proof containers to provide protection from moisture and corrosion. Advanced quality of seals/liners to be used to make the container air tight. (e) Palletisation of the ammunition to be provided.

Operational Characteristics

02. The operational characteristics are as under:-

<u>Parameters</u>	<u>Specifications</u>
Design Parameters	Parameters to achieve minimum DoP of 530mm.
Consistency	(a) Winds $\leq 5\text{m/s}$. (b) Horizontal Standard Deviation, mils (HSD) - 0.35mils at 2000 mtrs. (c) Vertical Standard Deviation, mils (VSD) - 0.35mils at 2000 mtrs.
Lethality (DoP)	DoP of Minimum 530mm at 60° from normal at 2000 mtrs.
Barrel Wear	≤ 1.9 Equivalent Full Charge (EFC) at 45°C .
Operating Temperature Range	Between 40°C and 45°C (Maximum temperature). Between minus 20°C and minus 10°C (Minimum temperature).
Chamber Pressure	$\leq 600\text{MPa}$.
Limit of Recoil	As per existing recoil range for Tk T-72 and T-90.

Operation and Maintenance

03. The Improved indigenous APFSDS ammunition with minimum Depth of Penetration (DoP) of 530mm should be easy to maintain in storage and field conditions:-

<u>Parameters</u>	<u>Specifications</u>
Maintenance in Storage and Field Conditions	(a) The round should have adequate markings for easy identification during Day & Night. (b) Normal repair or maintenance should be possible within the resources of the Field Ammunition Depot. Major repairs can be handled at the manufacturing plant of the nominated Development Agency. (c) Storage Temperature – As per JSG 0102.
Test Standards	The ammunition should be tested for performance as per JSG 0102.
Shelf Life	Minimum Shelf Life of ammunition should be 10 years with vendor certificate.

PART II - DESIRABLE CHARACTERISTICS

04. The desirable characteristics (please refer to Para 24 for evaluation of desirable/Enhanced Performance Parameters), is summarised as:-

<u>Parameters</u>	<u>Specifications</u>
Lethality (DoP)	(i) 550 mm at 60° from normal at 2000 meters.
	(ii) 540 mm at 60° from normal at 2000 meters.
Barrel Wear	(i) ≤1.7 Equivalent Full Charge (EFC) at 45°C.
	(ii) ≤1.5 Equivalent Full Charge (EFC) at 45°C.

Appendix 'C'
(Refer Para 19 of EoI)

COMMERCIAL EVALUATION CRITERIA

1. **Name of the Vendor :** _____
2. **Evaluation Criteria.**

<u>S No</u>	<u>Criteria</u>	<u>Vendor Submission</u>	<u>Reference</u> (Reference against vendor claim/ response must be flagged and mentioned in this column)	<u>Remarks (if Any)</u>
(a)	Nature of the Company [refer Para 1 (i) of Annexure I of Appendix A of Chapter III-A of DPP-16].			
(b)	Ownership Status [refer Para 1 (ii) of Annexure I of Appendix A of Chapter III-A of DPP-16].			
(c)	Category of Industry (Large/ Medium/ Small/ Micro).			
(d)	Registration Details.			
(e)	Minimum average turnover for last two financial years			
(f)	Present Net Worth.			

Station :

Signature

Company Seal

Date :

Note:-

1. All submissions must be supported by referenced documents duly authenticated.
2. Any input with incorrect or missing reference will not be assessed.

Appendix 'D'
(Ref Para 20 of EoI)

TECHNICAL EVALUATION CRITERIA

<u>Ser No</u>	<u>Criteria</u>	<u>Response</u>
1.	Any experience in manufacture or collaboration with foreign OEM of complete ammunition/accessories of ammunition including explosives.	Yes/No
2.	Existing ammunition manufacture related infrastructure/R &D/Quality Control Facilities.	Yes/No
3.	Whether holding explosive manufacture license or the same has been applied for from MHA.	Yes/No
4.	Whether the above ammunition being produced by manufacturer/OEM has been certified by any recognised entity/ In-service with any Armed Forces.	Yes/No
5.	Whether the firm possess adequate capability to absorb Transfer of Technology (ToT).	Yes/No

Station :

Signature

Company Seal

Date :

Annexure I to Appendix 'D'
(Refer Para 20 of Eol)

TECHNICAL EVALUATION COMPLIANCE MATRIX

<u>S No</u>	<u>PSQR Requirements</u>	<u>Vendor Claim Value</u>	<u>Remarks</u>
<u>PHYSICAL CHARACTERISTICS</u>			
1.	<u>Bore</u> . Should be capable of being fired from the existing 125mm 2A46 (T-72) & 2A46M (T-90) barrels.		
2.	<u>Ballistics</u> . The Ammunition Ballistics and properties should conform to Gun Barrel Design and must be compatible with existing Fire Control system (FCS) of T-72/T-90 tanks. The integration of ballistic data with existing ballistic computers to exploit the ammunition with existing sighting system & FCS.		
3.	<u>Size & Shape</u> . The ammunition must conform to the existing barrel designs and designated spaces within fighting compartment (including Rotary Conveyor). The round must be two piece ammunition as per the existing design for T-72 & T-90 tanks. The ammunition must allow stowage by Auto Loader and within the existing space.		
4.	<u>Handling in Field</u> . The ammunition should be robust enough and capable of withstanding varied terrain and temperature conditions as per Military Standards laid down in JSG 0102 for inspection and safety.		
5.	<u>Operational Functionality</u> . The ammunition should not obstruct or restrict the existing functionality of the tank/system & sub system or its operational employment.		

<u>S No</u>	<u>PSQR Requirements</u>	<u>Vendor Claim Value</u>	<u>Remarks</u>
6.	<u>Packaging.</u>		
	(a) Composite packaging for projectile and cartridge case in same package.		
	(b) Suitable markings on boxes for ease of handling and identification in the dark and in storage/ stacking at ammunition dumps.		
	(c) The ammunition boxes should be provided with adequate facility for carriage to be handled by two crew members in compliance with explosives safety standards.		
	(d) The boxes should be hermetically sealed in rust proof containers to provide protection from moisture and corrosion. Advanced quality of seals/liners to be used to make the container air tight.		
	(e) Palletisation of the ammunition be provided.		
<u>OPERATIONAL CHARACTERISTICS</u>			
7.	<u>Design Parameter.</u> Parameters to achieve DoP of Minimum 530mm.		
8.	<u>Consistency.</u>		
	(a) Winds \leq 5m/s.		
	(b) Horizontal Standard Deviation, mils (HSD) - 0.35mils at 2000 mtrs.		
	(c) Vertical Standard Deviation, mils (VSD) - 0.35mils at 2000 mtrs.		
9.	<u>Lethality (DoP).</u> DoP of Minimum 530mm at 60° from normal at 2000 mtrs.		
10.	<u>Barrel Wear.</u> \leq 1.9 Equivalent Full Charge (EFC) at 45°C.		
11.	<u>Operating Temperature Range.</u> Between 40°C and 45°C (Maximum temperature). Between minus 20°C and minus 10°C (Minimum temperature).		

<u>S No</u>	<u>PSQR Requirements</u>	<u>Vendor Claim Value</u>	<u>Remarks</u>
12.	<u>Chamber Pressure.</u> ≤ 600MPa.		
13.	<u>Limit of Recoil.</u> As per existing recoil range for Tk T-72 and T-90'.		
<u>OPERATION AND MAINTENANCE</u>			
14.	<u>Maintenance in Storage and Field Conditions..</u>		
	(a) The round should have adequate markings for easy identification during Day & Night.		
	(b) Normal repair or maintenance should be possible within the resources of the field ammunition depot. Major repairs can be handled at the manufacturing plant of the nominated Development Agency.		
	(c) Storage Temperature – As per JSG 0102.		
15.	<u>Test Standards.</u> The ammunition should be tested for performance as per JSG 0102.		
16.	<u>Shelf Life.</u> Minimum Shelf Life of ammunition should be 10 years, with vendor certificate.		

Station :

Signature

Company Seal

Date :

INFORMATION PROFORMA

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 (Manufacturer/ Trader/ Sole Selling or Authorised Agent/ Dealer/ Assembler/ Processor/ Re packer/ Service Provider). Please give broad product range as applicable.
11. Details of Current Products:-
 - (a) Type/ Description.
 - (b) Licensed/ Installed Capacity.
 - (c) Annual Production for preceding Three 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) Ordnance 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. Turn-over during the last Three Financial Years.
17. Any other relevant information.
18. Contact Details of the Executive nominated to co-ordinate with the Assessment Team (please provide telephone, mobile and e-mail address).

Appendix 'F'
(Refer Para 32 of Eol)

CONFIDENTIALITY AGREEMENT

The company understands the security and sensitivity of operational ammunition. No information pertaining to deployment and usage of the ammunition, including scaling, will be discussed with any third party without required 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

CORRECTNESS CERTIFICATE

It is certified that information submitted in the documents as part of the response to Expression of Interest for the project 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