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A/18203/MAII/Gen/Corg-11/OS-Amn Proc

22 March 2018

**CORRIGENDUM NO:11 (IInd Pre-Bid Meeting)**

**FINAL CLARIFICATION LETTER TO QUERIES RAISED DURING PRE BID MEETING HELD ON  
26<sup>th</sup> FEB 18 - TO TENDER ENQUIRY OF EIGHT RFPs FOR MFR OF  
AMN FOR IA BY INDIAN INDUSTRY UPLOADED ON 25<sup>TH</sup> AND 27<sup>TH</sup> MAR 2017  
ON e-PROC PORTAL-WWW.EPROCURE.GOV.IN  
DATE OF BID SUBMISSION IS 12 APR 2018. BID OPENING IS 13 APR 2018**

1. Please ref under mentioned tender enquiries uploaded on e-proc portal [www.eprocure.gov.in](http://www.eprocure.gov.in) on 25 & 27 Mar 2017 and Corrigendum uploaded which are as under:-

<b><u>Sno</u></b>	<b><u>Corrigendum</u></b>	<b><u>Publish date</u></b>	<b><u>Letter Reference</u></b>
<b>(a)</b>	No : 01	01 Jun 2017	No. A/18203/MAPI/ Gen/ Corg-01/OS- Amn Proc and all published on e-proc portal <a href="http://www.eprocure.gov.in">www.eprocure.gov.in</a> .
<b>(b)</b>	No : 02	04 Aug 2017	
<b>(c)</b>	No : 03	06 Sep 2017	
<b>(d)</b>	No : 04	06 Oct 2017	
<b>(e)</b>	No : 05	06 Nov 2017	
<b>(f)</b>	No : 06	07 Dec 2017	
<b>(g)</b>	No : 07	29 Dec 2017 (Five RFP)	
<b>(h)</b>	No : 07	04 Jan 2018 (BMCS, Elect Fz & 125mm FSAPDS/T)	
<b>(i)</b>	No : 08	08 Jan 2018 (BMCS)	
<b>(j)</b>	No : 08	11 Jan 2018 (Elect fz)	
<b>(k)</b>	No : 08	25 Jan 2018 (Five RFP & 125 mm FSAPDS/T)	
<b>(l)</b>	No : 09	09 Feb 2018 (08 RFPs)	
<b>(m)</b>	No : 10	13 Feb 2018 (08 RFPs)	

2. **IInd Pre-Bid Meeting.** Necessary **clarification on** queries/ suggestion raised by the industry during the pre bid meeting held on 26<sup>th</sup> Feb 18 are encl as Appx 'A' to this letter.

Sd/-xxxxxxx  
(Devesh Singh)  
Lt Col  
Dir OS (Amn Proc)  
For DGOS

**MANUFACTURE OF AMMUNITION FOR INDIAN ARMY BY INDIAN INDUSTRY**  
**FINAL CLARIFICATION LETTER TO QUERIES RAISED DURING PRE BID MEETING**  
**HELD ON 26 FEB 18**

**(DATE OF BID SUBMISSION IS 12 APR 2018. BID OPENING IS 13 APR 2018)**

<b><u>Ser No</u></b>	<b><u>Query</u></b>	<b><u>Draft Response</u></b>
<b><u>QUERIES COMMON TO ALL RFPs</u></b>		
<b><u>Queries Related to Critical Dates</u></b>		
1.	<b>Pre Bid Meeting and Date of Bid Submission.</b> A Pre Bid Meeting should be held to clarify any queries that vendors have. Last date of bid submission should be fixed at 60 to 120 days after the replies to the queries are received by the vendors.	The final Bid Submission Date has already been extended by 60 days to 12 Apr 2018. Bid Opening is scheduled on 13 Apr 2018.
<b><u>Queries Related to Financial Eligibility</u></b>		
2.	<b>Maximum Number of Contracts to be Offered.</b> In case a parent company and its wholly owned subsidiary both bid for all the RFPs can they both be given a max of three contracts each	A vendor may bid for any number of RFPs but will be allowed to sign only a maximum of three contracts. The preference of these three contracts is to be indicated in the technical bid itself. The intent behind the provision is to enlarge indigenous vendor base. A group of companies shall only be allowed a maximum of three contracts out of the total eight.
3.	<b>Wholly Owned Subsidiary as lead Company.</b> Can a Wholly Owned Subsidiary of a parent company taking the benefit of the financial credentials of the parent company to be able to bid for the RFP be the lead company of a consortium?	The provisions regarding the participation of consortium are clearly given out in the RFP. Only Indian companies are allowed to bid. An Indian company for the purpose of this provision shall be a company owned by bonafide resident Indian citizens and not having more than 49% foreign equity. The applicant company may enter into a consortium without any liability of the Govt but the entire liability of fulfilling the bid and contractual liabilities will rest with the applicant Indian company and MoD will deal with only this single entity. A consortium comprising only of Indian companies is allowed to bid. Such consortium of Indian companies bidding for any RFP shall indicate the lead company in the technical bid itself. All criteria of financial eligibility and bid/contract liabilities shall rest with this lead company.
4.	<b>Time for Submission of Trial Samples.</b> The RFPs mention that 120 days shall be provided to the vendors from the date of intimation by MoD for import of trial	120 days have been provided for submission of trial samples on the request of the vendors itself conveyed in the first Pre Bid Meeting held on 08 May 17. The Army HQ shall endeavor to

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	samples from OEM. The duration of 120 days should be counted from the issue of End User Certificate by MoD rather than from the date of intimation as the import process will commence only after issue of EUC from the MoD.	provide EUC along with the intimation by Army HQ for submission of trial samples.
5.	<b>Wilful Bank Default by Directors/ Board Members.</b> Financial Eligibility conditions demand that each Directors/ promoters of the applicant company should not be a willful defaulter of banks. The same is required to be certified by the statutory auditors of the company. It is not possible for auditors to have knowledge of any defaults by individuals in a personal capacity.	A certificate from the statutory auditors that the company has not availed/ applied for the Corporate Debt restructuring scheme (CDR)/ Strategic Debt restructuring scheme (SDR) of RBI in the last three years shall suffice. In addition a certificate from the Statutory Auditors (based in turn on a self-certificate rendered by the Directors/Promoters) that no Director/ Promoter of the company is involved in willful default on banks and that there is no legally proven fraudulent/ illegal transaction/ action against their name is required to be submitted along with the technical bid.
6.	<b>Definition of Capital Assets.</b> Do Capital Assets as mentioned under Financial Eligibility conditions mean Fixed Assets as Capital Assets have not been defined in the Companies Act 2013.	Capital Assets as per the understanding in vogue in the industry shall be used as a financial evaluation criteria and no change to the RFP is considered necessary on this account.
7.	<b>Wilful Bank Default by DPSUs.</b> Is the Certificate regarding willful default on banks required from DPSUs too	Yes.
8.	<b>Proof of Credit Rating.</b> The manner of proving Credit rating needs to be clarified. Will the print out of the relevant page from the Website of the Credit Rating Agency be acceptable of a Certificate from the Credit Rating Agency is required.	A certificate from the SEBI accredited Credit Rating Agency is required to be submitted.
9.	<b>Financial Credentials of Group of Companies to Establish Financial Eligibility.</b> Can the financial statements of a group of companies to which an applicant company belongs be submitted for establishing financial eligibility	Bidding by a company that is a wholly owned subsidiary of a Holding Company has been allowed. In that case the Wholly Owned Subsidiary may submit financial credentials of the Holding Company only one level up. The financial credentials of a group of companies cannot be used by a wholly owned subsidiary to claim financial eligibility.
<b><u>Queries Related to Technical Trials</u></b>		
10.	<b>Trial of Past Suppliers.</b> There should be no trials for past suppliers whose ammunition is presently In Service in Army	No one is exempted from trials.
11.	<b>Submission of Trial Samples.</b> Which agency is required to submit the NCNC Trial Samples	The applicant company in case a single entity is applying for the bids is required to submit the NCNC samples. In case of a consortium the Lead Company nominated by the consortium who is submitting the bid shall be responsible for submission of NCNC trial samples for trial evaluation

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12.	A service weapon from which the ammunition is intended to be fired should be provided for internal validation by the manufacturer.	The request may be considered on receipt of specific proposal from bidders found successful in Technical Evaluation
<b><u>Queries Related to Indigenization Road Map</u></b>		
13.	<b>Critical Technologies.</b> Critical Technologies have been listed in each RFP. Does it mean that other technologies pertaining to that RFP can continue to be imported?	Only the critical technologies that are listed in the RFP for each ammunition are required to be indigenized in the stipulated time frame as given in Para 4 (g) of Cover Note of RFP .
14.	<b>Indigenization of Propellant Manufacture.</b> Propellant has been listed as critical technology in several RFPs. The amount of propellant required is miniscule and therefore for indigenization of propellant technology by manufacturer infra will need to be set up which will not be a viable commercial proposition. Propellants may be deleted from the list of critical technologies or be allowed to be sourced from OFB or any other firms which have got explosive manufacturing license and are manufacturing these propellants.	No change to RFP.
15.	<b>Percentage of Indian Content.</b> Percentage of Critical technology and Indian Content to be achieved needs more clarity	The critical technologies for each ammunition mentioned in the RFP are to be indigenized 100% in the time frame stipulated for indigenization in the RFP. Within the same time the Indian Content of 50% on overall cost has to be achieved. The same shall be verified by a Board of Officers comprising all stakeholders at the end of the period laid down to achieve indigenisation. The time frame for indigenization for APFSDS is three years while for all others it is two years
16.	<b>Cost of Dynamic Proof for Validation of Indigenization.</b> Who will bear the cost of the ammunition for Dynamic Proof by Board of Officers	The cost of Dynamic Proof for the purpose of verification of indigenization by Board of Officers shall be borne by the vendor
17.	<b>Submission of Ammunition with Improved Specifications for Trials.</b> Are all technical specifications of the ammunition as included in the RFP required to be met. In case a few specifications of the ammunition like dimensions etc offered by the vendor are different from the In Service specifications without any change in operational and performance parameters can the ammunition be acceptable. The query relates to GRAD ER Rkt and BMCS where in the specifications mentioned in the RFP	The issue has already been clarified in the Clarification letter issued along with the final corrigendum. An improved product with slightly different dimensions or other specifications but still meeting all the performance and operational parameters can be offered for trials. The bidder shall be required to certify that the ammunition offered for trials is compatible and safe to be fired from the In Service equipment and confirms to the Range and ballistic performance as per the In Service Range table. This certificate shall be rendered with the technical bid itself. Cost of any damages

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	are based on In Service specs which are of imported ER Rkt and BMCS. DRDO has developed indigenous versions of ER Rkt and BMCS with slightly different dimensions or ballistic parameters but no major change in performance or operational characteristics. Similarly some vendors have queried if Electronic Fuzes with slightly different weight etc can be acceptable	incurred as a result of these trials will be borne by the vendor.
18.	<b>Explosive Manufacturing License.</b> Para 4 (d) of the Cover Note of the RFP mentions that the necessary ammunition manufacture license as per existing laws on the subject will have to be obtained by the manufacturer. The participating manufacturers will be responsible to obtain necessary clearances from MHA (under Arms Act), from DIPP (manufacturing licenses) and any other permissions and clearances necessary for manufacture of ammunition as per existing laws on the subject. MoD may coordinate with central and state govt agencies for expeditious grant of warranted permissions/ licenses. Does this provision imply that all bidders will be required to manufacture the explosives required for the manufacture of the ammunition themselves for which they will need to obtain license as mentioned above. If yes it may prove to be prohibitively expensive and time consuming. It is recommended that the vendors may be allowed to source explosives from companies that are already manufacturing these explosives.	No change to RFP.
19.	<b>Timeframe for Indigenization.</b> The period stipulated for absorption of technology should be extended to four years in place of the present time frame of three/two years.	No change to the period stipulated for indigenisation is considered necessary.
20	<b>Export of Components.</b> Export is permitted after completion of indigenization, meeting Army's requirement and permission from the MoD. Can export of certain components be allowed for the OEM to manufacture the rocket before indigenization is complete?	Permission to export may be sought as per existing provisions on the subject as given in Para 4(j) of Cover Note of RFP. Export is permitted after meeting Army's requirement, completion of indigenization and permission of MoD..
21.	<b>Validation of Indigenization.</b> After completion of indigenization a BOO of the User shall verify the level of indigenization achieved. Please elaborate. Will the time taken by the BOO to ascertain the same be	Validation of indigenization achieved shall be an all-encompassing process audit, including dynamic firing checks, of the manufacture of the ammunition which shall be undertaken by a composite board of Officers including

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	deducted from the delivery schedule as the same is likely to take long time	representatives from all stakeholders. This validation shall be undertaken once at the end of the period stipulated for achievement of indigenization. In case a particular raw material is not available in India then it may continue to be imported and the same shall not be held against the achievement of indigenization. The time taken for the BOO to ascertain the level of indigenization achieved shall not be included in the delivery schedule. It shall be the endeavor of Army HQ to complete this as early as possible.
22.	<b>End User Certificate and Confidentiality Agreement.</b> End User Certificate and confidentiality agreement should be provided before export is undertaken by the manufacturer	Export of the ammunition is permitted after indigenization is completed, the Army's requirement is met and permission for the same explicitly given by MoD subject to all other provision governing such export. End User Certificate shall be required to be furnished by the importer from the intended recipient Govt. Confidentiality clauses have been included in the RFP and shall be included in the contract subsequently. IPR of the Seller shall be protected. The manufacturing drawings and specifications of the ammunition manufactured by the Indian companies shall not be shared with another manufacturers. These drawings and specifications are required for DGQA to fulfil their duties as the AHSP of the ammunition and shall not be used for any other purpose.

#### Queries Related to Payment & Commercial Terms

23.	<b>Integrity Pact bank Guarantee.</b> Why is an additional IPBG required? Is it required to be submitted along with the bid or at the time of signing of contract? What is the required validity of the IPBG? What is the format of IPBG. Can the IPBG be made from a private bank authorized to do Govt business. Validity of IPBG needs to be clarified. The details of Beneficiary name, bankers details with a/c number and IFSC Code etc are required to be intimated for making the IPBG	IPBG is required as per provisions of DPM 2009 as the overall cost of the proposal is more than 100 Cr. IPBG in original is required to be submitted along with the bid in physical form with a scanned copy along with the online technical bid. The validity of the IPBG is required to be five years from the date of submission or completion of complete contractual obligations whichever is later. The format of IPBG may be as per DPM Form 13. The IPBG may be made from any authorized bank as per DPM 2009. Beneficiary details shall be as per procedure in vogue in Capital Procurement.
24.	<b>Cost of DGQA Facilities.</b> Tentative details of the cost of facilities to be provided during PDI/JRI should be provided as they have a commercial implication	The cost of DGQA facilities shall be as per the existing procedure of DGQA on the subject.
25	<b>Advance Payment.</b> The payment terms mention an advance of 15% to be paid. Will	The advance of 15% shall be paid against the annual order value. The same shall be paid on

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	this 15% be against the total order value of 10 years or against the annual order value	a pro rate basis as per the existing procedure.
26	<b>Exchange Rate Variation.</b> Provision for Exchange Rate variation is not included in the RFP. Will ERV be provided to DPSUs	ERV shall not be provided for to any company under this scheme.
27	GST percentage and HSN Code for Electronic Fuze and Fuze hand setter are required to be intimated	As per existing provisions of GST
28	<b>Reimbursement of BCD Escalation.</b> Basic Price is to be quoted inclusive of Customs Duty. The rates of Customs Duty are fixed and decided by the Central Govt. Any subsequent increase in Customs Duty should be reimbursed as per actuals on submission of proof of payment	Procedure for reimbursement of BCD escalation shall be as per DPM 2009
<b><u>Miscellaneous Queries</u></b>		
29	<b>RFP Reference Number.</b> In some RFP the reference number has been changed from MAPI to MII. Which reference number is required to be quoted?	The original reference number is valid.
30	<b>Signing Authority.</b> Can signing authority be different from the person uploading the bid with his digital signature?	Yes. The accountability of adherence to the bid and contractual conditions shall ultimately rest with the company on whose behalf the bids are submitted and contract signed.
31	<b>Ratio of Apportionment.</b> What will be the ratio of apportionment to L2/L3 in case contract cannot be offered to L1? What if L2/L3 decline to offer at L1 rates.	A vendor cannot be offered more than 3 contracts out of the total 8 as per his preference of three contracts which are to be indicated in the technical bid itself. In case a vendor is L1 in more than 3 contracts, the contracts not being offered to the L1 vendor because of this stipulation shall be offered to L2 vendor provided he agrees to supply at L1 price and meeting all other criteria. In case L2 declines, the final decision on an offer to L3, or apportionment of quantity between L2 & L3 or retendering shall be taken by CNC constituted for the purpose.
32	<b>Banned Companies.</b> List of banned companies may be provided.	The details of banned companies are available on the MoD website
33	<b>Participation by OFB.</b> Is OFB allowed to bid for the project	No clarification to this question is considered necessary.
34	<b>Participation by DPSUs/PSUs.</b> Permission has now been granted to allow DPSUs and PSUs to participate in these RFPs. This provision is likely to deny a level playing field to the private Indian Industry as the DPSUs and PSUs who	The issue has been deliberated at length and the competent authority has approved participation of the DPSUs/PSUs in this project. No change to the same is considered necessary.

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	have already established infra, production lines and already acquired technology from foreign OEMs will be able to undercut the prices offered while the private Industry will have to load their offered prices with the cost of establishing of infra and production lines as well as acquisition of technology	
35	<b>Price Quote of Variants.</b> Is the price of all variants included in the RFP required to be quoted separately for each of the ten years or a combined total price of all variants be offered for each of the ten years in the commercial bid	The price of each variant of ammunition for each of the ten years is required to be included in the commercial bid.
36	<b>Submission of Commercial Bid.</b> Is the commercial Bid required to be submitted online as a PDF document?	Yes. The commercial bid may be submitted as a PDF document as the Commercial Bid Format for this RFP is different from a standard commercial bid.
37	<b>Applicability of Provisions to BEL.</b> BEL is a DPSU and a present supplier of Electronic Fuzes for the Army. Do provisions regarding trial evaluation, submission of EMD, Integrity Pact and IPBG applicable to BEL or other DPSUs	Yes. All provisions are applicable equally to all bidders
38	<b>Written Clarifications to Queries.</b> Many companies have asked for Minutes of Pre Bid Meetings or Written Clarifications addressed to the companies for them to proceed ahead.	This Clarification Letter should be taken as the final clarification and companies should proceed ahead with submission of bids.
39	<b>Track record of Partners.</b> Can Indian Companies tie up with any foreign OEM irrespective of their track record with the Govt of India	Tie ups with companies that are currently banned for dealing with Govt of India are not allowed to participate in any form in this project.
40	At present 45 days have been catered for conduct of PDI. The same should not be kept open ended. In case the PDI of articles is not undertaken by DGQA within the laid down time for reasons not attributable to the vendor no LD should be charged for resultant delay in supplies	The recommendation is agreed to. In case the deliveries are delayed because the PDI has not been undertaken on account of factors not attributable to the vendor, no LD shall be charged for the resultant delay in supplies.
41	The RFP for 40 mm MGL ammunition includes a Red Phosphorus variant. OEMs in western countries are under obligations of various international conventions to not manufacture/ export Red Phosphorous ammunition. It is requested that Red Phosphorus variant may be removed from the 40 mm MGL ammunition RFP	In previous procurement cases a number of vendors have responded to the tenders for RP ammunition and have also submitted NCNC samples for trial evaluation. The suggestion is not agreed to.
<b><u>RFP SPECIFIC TECHNICAL QUERIES</u></b>		



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<b><u>Electronic Fuzes for Arty Guns (07 Variants)</u></b>		
42	Antennae and Transmitter are listed as critical technology in case of Electronic fuzes RFP. These are used only in case of proximity fuzes and not in case of PD or Time fuzes. The foreign OEM shall not provide the ToT for complete Electronic Modules in this scenario. Hence complete Electronic Module should be included as Critical Technology for all variants of Electronic Fuzes for Arty Guns	Reserve Battery, Electronic detonators, SAD, Reception and Transmission module have been included as the critical technology. Antennae and Transmitter are only used in Proximity Fuze. The list of critical items to be indigenized has been decided based on their functional criticality to end store. If complete Electronic Module can be indigenized by vendor, same can be accepted.
43	PD Fuze of 155 mm Arty Amn is to be settable by Electronic Fuze Setter of Mechanical Switch	Mechanical selection switch to be used for selection of mode PD or PD Delay. There should be no requirement of electronic fuze hand setter for PD Fuzes. Setting should be settable by means of a mechanical switch or a key
44	Appx A1 Ser H For PD2 Fuze for 130 mm the Velocity Range is mentioned as 180 to 1100 m/s while in Appx A4 Ser H for Proximity Fuze for 130 mm the velocity range is mentioned as 180 to 1000 m/s. Please clarify	This is a Typographical error. The velocity range for 130 mm is 180 m/s to 1100 m/s.
45	Safe Setting in Electronic Fuzes is set by an electronic hand setter. Therefore setting of modes such as PSDQ/Delay/Safe should be allowed to be done by a electronic fuze hand setter	There should be no requirement of electronic fuze hand setter for PD Fuzes. Setting should be settable by means of a mechanical switch or key. Accordingly the requirement of Safe Mode has been taken off for PD Fuzes. PD Fuzes should have only two modes PD and PDSQ.
46	Readability of markings on fuzes at night needs to be amplified	Markings on the Fuzes should be made in Luminous paint so that they are readable at night.
47	Since PD Fuzes for 105 mm Gun are no longer being procured through this RFP Appx B1 may be deleted	Agreed to.
48	For 130 mm/ Charge 3/ MV 621 m/s the activation time for PD Fuze is 1.2 secs. The target distance from the muzzle end should be changed to 750 m in place of 650 m for the delay mode to function properly	Target distance is to be fixed according to maximum activation Time given by vendors. The same will be finalized during pre-trial meeting.
49	For 155 mm/ Zone 3/ MV 515 m/s activation of Time Fuze is 1.2 Secs. The target should be placed at 625 m from muzzle end in place of 600 m for delay mode to function properly	Target distance to be fixed according to maximum activation Time given by vendors. The same will be finalized during pre-trial meeting.
50	Chamber Pressure acceptable for all fuzes to be clarified	Details are as given in technical specification against parameter of velocity & Pressure (Annex A1 to A7 to RFP) for each fuze.
51	Min and Max temp for use of all fuzes	Details are as given in technical specification

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	should be clarified	against parameter of Environmental condition (Annex A1 to A7 to RFP) for each fuze.
52	Environmental Tests on Electronic Fuzes are qualification tests and can be performed only once on a fuze. Hence OEM certificate should be acceptable for these tests	Being qualification tests, these tests may be accepted during DGQA Trial Evaluation based on OEM certification. Infra and facilities with DGQA to undertake such qualification tests are in the process of being established. In case they are established in time then qualification tests may be undertaken by DGQA. However, these tests shall be carried out on Pilot lot during production and validation trial to confirm indignation contents.
53	Appx B1 Para 6(a) (iii) says that any premature function will be treated as a critical defect. What is the pass criteria for these tests	Acceptance criteria for critical defect is Accept - 0 and Reject - 01.
54	Appx B1 Para 6(a) (ii) says that 14 Electronic Fuzes after being exposed to above mentioned tests will be conditioned at specific temperature for 6 hrs and then subjected to dynamic firing test. Will the shells be fired with highest charge	Yes. The shells will be fired with highest charge
55	Appx B1 Para 60(b) says that for conduct of SAD Test for Time Fuze, the electronic fuze should be supplied by the vendor with booster for evaluation with inert flash filled shell. Time fuze will have to be modified to have booster pellet and profile of HE fuze. The same may be clarified	Yes, Time fuze is to be supplied with the booster pallet for DGQA Technical evaluation. There is no need to change the profile of the fuze. Safety distance is 100 m for non-functioning of the Fuze. The same will be tested.
56	Appx B1 Para 13(c) Note 1 says facility required for this test will be provided by CPE Itarsi. Note 2 says no separate fuze container will be required for this test as packed fuze container will be selected randomly from the samples provided for dynamic proof which will happen at Balasore. There appears to be a mismatch. Test should be done at PXE Balasore using fuze containers provided for DGQA trials	PXE Balasore has not been mentioned at Appx-B1. Test will be carried out as per the details given in the RFP
57	Appx C1, C2 and C3 only provide compliance Matrix and quantity of fuze required for User Trials. The User Trial methodology is not mentioned	The User Trial methodology given in the RFP is amply clear
58	Appx B4 Ser 2 Storage Test at + 70°C± 3°C for 16 hrs with equipment Switched ON condition. Recovery 2 to 4 hours. This should be changed to equipment Switched OFF condition	The equipment will be tested in switched Off condition.
59	Part I Para 10(a) (iv) does not mention the number of Fuze Hand Setters. No mention is made of Battery Evaluation of Fuze Hand Setter too	One fuze hand setter is required for DGQA Technical evaluation. Evaluation of Battery will be carried out depending upon the power source used. The requirement of evaluation will be clarified during pre-trial meeting.

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60	Appx C1, C2,C3 Vendors have been asked to provide range tables for fuzes for all Arty Shells for MSL, 2000 M and 4000 M. This is beyond the purview of fuze manufacturers	The requirement has been included in the operational characteristics as “The vendors must provide the range tables for new electronic fuzes for all the variants in use with the Indian Army with the equipment for MSL, 2000M and 4000 M”. The clause included at sub para 1(a) of technical specifications and functional trials is “ the fuze should be compatible to fire with existing ammunition and meet range tables requirements for 105 mm, 130 mm and 155 mm guns in Indian Army”. The requirement of range table may be disregarded from the op characteristics as the requirement of compatibility is adequately covered in the technical specifications.
61	Appx A7 Para 1(c) says that Fuze should have two modes of operation- Proximity and PDSQ. Fuze function can be selected between the two modes by hand held inductive setter. However the Appx deals with Time fuze of 155 mm Gun. Please clarify	There is a typographical error. For Proximity Read Time
62	At page 33, 36, 39,43,47,51 and 55 Max and Average Relative Humidity has been expressed in °C. It should be in %	Agreed to. It is %.
63	Appx A8 Para 1(b)(i) 13 mm should be replaced by 130 mm	It is a typographical error. For 13 mm Read 130 mm
	Appx A8 Para 1(b) (iv) says that Fuze setter should have the capability to apply fuze setting from 03 secs ± 0.2 sec to at least upto 199 secs. Is it to be understood that Fuze should be settable from minimum 2.8 secs.	Fuze should be settable from minimum 2.8 secs.
64	Appx A8 Para 1(b) (xii) says that Fuze hand Setter should be less than 1.75 KG in weight. Is this weight inclusive of packaging and/or battery	Yes. The weight is inclusive of packaging and Battery.
65	Appx A8 Para 1(b) (xiii) says that Electronic Fuze Hand Setter should not be more than 225 mm x 110mm x 85 mm in dimension. Does this include programming handle	Yes. The dimension includes programming handle
66	Appx B1 Para 6(b). Percussion Fuze has been included in the table. The same can be deleted as Percussion Fuze for 105 mm is not being procured	This is a typographical error. Please disregard requirement related to PD Fuze of 105 mm
67	Appx B1, B2 and B3. Functioning proof of Delay mode for Percussion Fuze of 130 mm and 155 mm. RFP says a minimum delay of 0.4 secs is required after impact on target. There should be a mention of a upper limit in this as otherwise a nonfunctional fuze would also be	Minimum delay is of 0.04 sec. Nonfunctioning of Fuze is treated as blind defect. However, upper limit for delay is required to be fixed to avoid anomaly at later stage.

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	considered OK	
68	Appx B4 Ser No 2. Operation Test. + 55 °C ±3°C for 16 hrs in equipment switched ON condition PC during last half hour. What does PC stand for	PC Stand for "Performance Checks". Performance check will be carried as per the Acceptance Test Procedure (ATP).
69	Appx B4Ser No 1. Vibration Test is to be done with or without package	Vibration test is to be done without package.
70	Appx B4 Ser 2. Switched ON condition should be Switched OFF condition. Further please clarify if test will be undertaken with or without battery	Test will be under taken with battery. Operation Test: Equipment under test in Switched ON condition Storage Test: Equipment under test in Switched OFF condition
71	Appx C1 Ser 1(a) can be deleted as item is not under procurement	Agreed.Please disregard requirement related to PD Fuze of 105 mm
72	Appx C1 Ser 5. 155 mm should be replaced by 105 mm	Agreed to.For 155 mm Read 105 mm
73	Appx C1 Ser 9 and 10 can be deleted as item is not under procurement	Please disregard requirement related to PD Fuze of 105 mm
74	Appx C2 Ser 19 refers to three variants whereas only two variants are required	For three variants Read two variants
75	Appx C2 Ser 25 and 26 can be deleted as Time Fuze of 130 mm is not under procurement	Please disregard requirement related to Time Fuze of 130 mm
76	MV of all charge settings and Rifling Angles of all calibres may be provided	Enclosed as <b>Appendix "A" to this Clarification Letter.</b>
77	Does a vendor need to qualify in all variants included in the RFP before their commercial offer shall be opened	Yes.
78	In the Clarification Letter uploaded on 29 Dec 17 at Ser No 51 the weight of Percussion Fuze of 155 mm shell is mentioned as 825 ± 25 gm. As per vendors it should be 900 ± 25 gm	There is typographical error in the clarification. Corrected information is enclosed as <b>Appendix "B" to this Clarification Letter.</b>
79	First consignment is required to be delivered after signing of contract within 06 months of signing of contract. This may not be possible owing to complexities of supply chain and sourcing of components. Hence it is recommended that the time schedule for first consignment after signing of contract may be kept as 09 months after signing of contract instead of six months	The recommendation is agreed to.
<b><u>30 mm HEI/HET for BMP 2 (02 Variants)</u></b>		
80	The rate of Fire of 30 mm Gun on BMP may be specified. Is the gun of OFB manufacture	30 mm Gun (ART 2A42) of ICV BMP-II is manufactured by OFB. The rate of fire of gun of BMP-II is as follows:-

<u>Ser No</u>	<u>Query</u>	<u>Draft Response</u>
		(a) Low rate of fire – 200 to 300 rds / min (b) High rate of fire – Minimum 550 rds / min
81	In 30 mm HEI/T RFP the reqmt of ammunition for DGQA/User Trials is not clear. (Para 50 of Appx B)	There is typographical error at various places in Appx-B. <b>Amended DGQA and User Trial Eval details area attached at Appx C and Appx D to this Clarification Letter</b>
82	In 30 mm HEI/T RFP there is a mismatch in the ammunition required for trials (Para 10 of Appx B)	There is typographical error at various places in Appx-B. Amended DGQA and User Trial Eval details area attached at Appx C and Appx D to this Clarification Letter
83	In 30 mm HEI/T RFP Para 13 of Appx B mentions Annx 1. However Annx I is not found attached.	There is typographical error at various places in Appx-B. Amended DGQA and User Trial Eval details area attached at Appx C and Appx D to this Clarification Letter
84	Is 30 mm HEI/T with a Rate of Fire of 350 rounds/min in place of 700 rounds/min and Self Destruction Time of 7.5 to 14 secs in place of 9 to 14 sec acceptable	The rate of fire of gun of BMP-II is as follows:- (a) Low rate of fire – 200 to 300 rds / min (b) High rate of fire – Minimum 550 rds / min.
85	Quantity of each type of rounds required for each of the tests under DGQA evaluation should be clearly mentioned.	There is typographical error at various places in Appx-B. Amended DGQA and User Trial Eval details area attached at Appx C and Appx D to this Clarification Letter
86	Para 10(b) of Part I of RFP mentions that User Trial Methodology is given out at Appx C. Similarly Para 13 of Appx B mentions that the User Trial Methodology is placed at Annexure 1 to Appx B. There is not Annexure 1 to Appx B in the RFP while Appx C gives out the ATP for PDI/JRI) Check Proof).	There is typographical error at various places in Appx-B. Amended DGQA and User Trial Eval details area attached at Appx C and Appx D to this Clarification Letter
87	In Appx A the rate of Fire of HEI and HET is mentioned as 700 rounds per minute in High Rate of Fire. SD Time is mentioned as 9.0 to 14 Secs. Some vendors have represented that as per their understanding the Rate of Fire should be Not Less Than 550 rds/ min and SD Time should be 7.5 to 14.5 secs.	The rate of fire of gun of BMP-II is as follows:- (a) Low rate of fire – 200 to 300 rds / min (b) High rate of fire – Minimum 550 rds / min.

### **23 mm HEIT/API/T for Zu 23 Air Defence Guns (02 Variants)**

88	Para 1 Part II states that Quantity 3, 00,000 of HEI/T and 2, 00,000 of API/T /yearly for next 10 years is required to be supplied. Ratio for HEI/T: API/T to be 3:1. The 3:1 ratio is not possible with the given quantities. Is the ratio of 3:1 between HEI/T and API/T or between the explosive and tracer rounds of each type separately	The quantities sought are correct. The ratio is between HEI and HET and between API and API.
89	Rate of Fire has been mentioned as 850 rds/min for HEI/T and API/T. Why is this being checked or ammunition as the rate of fire is a function of weapon and not of	The pattern and accuracy is a function of weapon, firer and the ammunition. Ammunition should be designed in such a way to achieve the stated rate of fire of weapon system and

<u>Ser No</u>	<u>Query</u>	<u>Draft Response</u>
	ammunition	automaticity. However, rate of fire may not be checked during DGQA Evaluation. There are ways to fix the weapon and firer parameters in order to check the consistency of the ammunition. Pattern and accuracy shall be checked during User Trials.
90	Para 1 Appx A (ad) and (ae) the unit for P Mean should be Mpa in place of Kg/cm <sup>2</sup>	Agreed to. For Kg/cm <sup>2</sup> read Mpa
91	Detailed nomenclature, make of gun and chamber dimensions etc should be provided	<u>Nomenclature</u> :- 23 mm AA Twin Gun Model ZU-23 <u>Make</u> :- Ex-USSR <u>Chamber Dimension</u> :- Not available being Record of Receipt equipment.
92	At Appx B Para 5 (c,d,g,h,i) the required rounds for tests are HEIT of APIT	No of rounds mentioned at Para 5 (c),(d)&(g) are required for each type of Amn i.e. HEIT and APIT. Rounds mentioned at Para 5 (h) & (j) are for APIT only.
93	NABL certificates of Labs where the internal testing of the ammunition has been carried out are reqd to be submitted as per Para 6 Appx B. Vendors have requested that certificates from OEM may be accepted as the ammunition being offered for trials is being imported and not manufactured in India.	Certificate from recognised international Lab / OEM will be accepted during DGQA Technical Evaluation.
94	User Trials at Appx C Para 3 (f) (iv) mentions that pattern and accuracy of the ammunition will be checked against ground target. Why is this being done as accuracy is a function of gun and firer	The pattern and accuracy is a function of the weapon, firer and the ammunition. There are ways to fix the weapon and firer parameters and check the consistency of the ammunition
95	DGQA Trials are given at Appx B. Appx B Para 8(c) refers to Para 10 which is missing	There is typographical error. 10% additional samples are to be provided as reserve rounds. Necessary amendment shall be made in the RFP
96	Encl 1 refers to Para 3(b) of Part II of RFP. No such Para exists	For Para 3(b) of Part II of RFP Read Para 2(b) of Part II of RFP
97	Is 23 mm Amn with tracer burning time of not less than 3.5 sec in place of 5.4 secs and SD time of 4.5 to 11 secs in place of 5.4 to 12 secs acceptable	Tracer Burning time and SD Time is required to be as per the RFP requirement.
98	Appx A Para 1(a) (ad) and Para 1(b)(ad) P Mean is mentioned as 2985 Kg/cm <sup>2</sup> for a group of rounds. Some vendors have represented that based on their understanding the mean pressure for a group of rounds should be less than 2985 bars	Kg/cm <sup>2</sup> is typographical error. It should be MPa. P mean should be less than or equal to 292.5 MPa for a group of rounds as mentioned in the RFP.
99	Tracer Burning time should be Not Less Than 3.5 Secs in place of Not Less Than 5.4 secs. SD Time should be changed to 4.5 to 11.5 secs in place of 5.4 to 12 secs	Specifications as per the RFP are required

<u>Ser No</u>	<u>Query</u>	<u>Draft Response</u>
<b><u>125 mm APFSDS/T for Tank T72/T90</u></b>		
100	Is the RFP for APFSDS ammunition being retracted	The In Service specification of APFSDS ammunition have not been recommended to be procured by the User Dte. Final decision on continuation or retraction of RFP is awaited and shall be communicated as soon as it is finalized.
101	The Shelf Life of APFSDS amn for 15 years is possible only under controlled storage conditions. Shelf life shall reduce to 10 years in case of normal storage conditions. The storage conditions of -50 C and +70C should be reviewed or shelf life revised	The shelf life required is as per RFP.
102	Appx A Para 3 mentions that the details of decoppering agent used in the Semi Combustible Cartridge Case has to be included in the technical literature. Some vendors intend to supply APFSDS round that does not include a decoppering agent. Please clarify	If Vendor supplies SCC without decoppering agent, he has to give the details about how decoppering of Barrel will be achieved as HE / HEAT is also fired from the same Gun.
103	Appx B Para 5(a). Will environmental Tests (Jolt, Bump, Vibration, Impact Tests) be carried out on live ammunition with Inert primer	Yes, as given in RFP.
104	Appx B Para 8(b). Can separate rounds be used for Strength and Functioning tests with Crusher Gauge and IPG? IPG has a maximum battery life of 24 hours. Thus it is not feasible to undertake strength and functioning test on the same round with IPG in 24 hours. If IPG needs to be inserted after environmental tests then SCCC needs to be disassembled.	Crusher gauge will be used.
105	Will the hit be not counted as a Countable Hit if Yaw Angle is more than 1 Degree	Yaw Angle of more than 1 <sup>0</sup> will not be considered for countable hits
106	HBL plans to offer AMK 340 A in collaboration with IMI Israel. The MV of this amn is 1660 ±17 m/s at + 15 <sup>0</sup> C. The RFP mentions MV at 1700 ± 17 m/s at + 15 <sup>0</sup> C. The product planned to be offered by us (340A) is able to achieve the stated DoP in the RFP (460 mm). Is the product acceptable?	Ammunition with slightly different specifications but with no effect on compatibility and operational parameters and subject to meeting all other criteria may be trial evaluated.
<b><u>30 mm Grenade for AGL 17</u></b>		
107	Critical parameters and dimensions of the service equipment such as shot seating, breech block, firing mechanism etc of AGL 17 should be provided because Russian equipment is believed to be slightly	Details are not available with DGQA being a Record of Receipt equipment.

<u>Ser No</u>	<u>Query</u>	<u>Draft Response</u>
	different from known international standards in order to ensure only their ammunition fires from their weapon.	
<b><u>122 mm GRAD ER Rkt</u></b>		
108	Please confirm that the consistency will be checked as a % of Circular Error Probability at 32 KM range. What is the max % of CEP permissible?	<p><b>Accuracy of fire</b>( Mean deviation of projectile impact point from the aim point ) :-            (a) Range – 0.7% to 0.8% of the range.            (b) Direction –0.8% to 1.1 % of the range</p> <p><b>Consistency of fire-</b> (Mean deviation of Projectile Impact Point from the center of salvo fire ):-            (a) Range (Probable error for Range / Range) - less than or equal to 0.65% of the Range.            (b) Direction (Probable error for direction / Range) - less than or equal to 1.0% of the Range.</p> <p>Test of accuracy and consistency will be carried out at the maximum range.</p>
<b><u>40 mm MGL/UBGL Ammunition (05 variants)</u></b>		
109	Caliber of 40 mm MGL and UBGL may be clarified. Is it 40 x 53 mm or 40x 46 mm	The Grenade is 40x46 mm.
110	Is the ammunition required to be trial evaluated on the In Service weapon system or the OEM specified weapon	The ammunition shall be trial evaluated from the In- service weapons.



**Appendix – A**  
**(Refer Ser 76 OF Clarification Letter)**

**MV AGAINST DIFFERENT CHARGES FOR**  
**105 mm, 130 mm AND 155 mm CALIBER GUN**

<b>Ser No</b>	<b>Store</b>	<b>Propellant Charge</b>	<b>Expected Velocity</b>
(a)	Electronic Fuzes for 105 mm	Super charge	710 m/s
		Normal Charge (Ch-1)	227 m/s
(b)	Electronic Fuzes for 130 mm	FVC	930 m/s
		RVC (Charge 4)	525 m/s
(c)	Electronic Fuzes for 155 mm	Charge 9 for 39 Cal Gun	818 m/s
		BMCS Zone 6 for 45 Cal Gun	878 m/s
		Charge M4A2(4W)	347 m/s

**RIFLING ANGLES FOR**  
**105 mm, 130 mm AND 155 mm CALIBER GUN**

<b>Ser No</b>	<b>Parameter</b>	<b>105/37 FD Gun E1</b>	<b>105/37 LFG E2</b>	<b>130 mm M46</b>	<b>155/45 FD Gun E1 Soltam (130 mm Up-gunned)</b>	<b>155/39 mm Bofors</b>
(a)	No of Groove	28	28	40	48	48
(b)	Helix Angle	9° 23' 19"	9° 23' 19"	5° 58'		
(c)	Helix Type	Right Handed	Right Handed	Right Handed	Right Handed	Right Handed
(d)	Nature of Rifling	Uniform twist, 1 turn in 19 cal	Uniform twist, 1 turn in 19 cal	Uniform twist, 1 turn in 30 cal	Constant 1 :20	Uniform twist, 1 turn in 20 cal

**Appendix – B**  
**(Refer Ser 78 of Clarification Letter)**

**MAXIMUM WEIGHT OF IN- SERVICE ELECTRONIC FUZES FOR 105 mm, 130 mm AND  
155 mm CALIBER GUN**

<b>Parameter</b>	<b>Fuze</b>	<b>105 mm</b>	<b>130 mm</b>	<b>155 mm</b>
Weight	Proximity	1025 g	1035 g	850 g
	Percussion	1150 g	1230 g	1035 g
	Timed	900 g	830 g	852 g
CoG		NA	NA	NA

**DGQA EVALUATION PROGRAMME FOR 30MM HEI AND HET AMN**

1. The tentative DGQA Evaluation Programme is enumerated in succeeding paras. The subject programme is liable to modifications based on test facilities available, OEM documents and discussion with the OEM reps during the Pre – Trial Meetings.

2. **Aim.** To evaluate the performance & assess the suitability of Rd 30mm HEI and Rd 30mm HET Amn to meet functional and safety requirements for **in service weapon i.e. 30mm Cannon.**

3. **Responsibility.** CQA(A) Khadki (DGQA).

4. **Proof Establishment.** SQAE(A) & LPR Khamaria(DGQA).

5. **Type of Tests.**

(a) **Visual Inspection, Dimensions and Weight Inspection.** Qty 200 Rds each for HET and HEI Amn. .

(b) **Environmental Tests.** Qty 03 boxes (30 Rds live in each box) with original Packages to be subjected to under mentioned tests as per SpecnJSG 0102 / MIL standards.

(i) **Impact (Vertical) Test.** 01 box (Each box contains Qty 30 Rds).

(ii) **Bounce Test/ Transport Simulation.** 01 box (Each box contains Qty 30 Rds).

(i) **Vibration Test.** 01 box (Each box contains Qty 30 Rds)..

(iv) **Hermetic Sealing Test for Package or Pressure Tightness Test.** The Packages with Rounds subjected to Vibration are to be used for this test.

(c) **Checking Muzzle Velocity of Shell.** Qty10 Rds.

(d) **Checking Pressure of Propellant gases.** Qty10 Rds.

(e) **Checking of Rds for safety and functioning.** Qty 50 Rds each required for HET and HEI Amn .

(f) **Consistency.** Qty 20 Rds + 02 Rds as Warmer/SighterRds each required for HET and HEI Amn .

(g) **Checking of Tracer for failure free functioning, burning time and visibility of tracer ( for 30mm HET Amn only)** Qty 20 Rds

(h) **Checking of lower limit of Arming** Qty 10 Rds

(j) **Checking of Reliability of Action, Delay Time and for High Order Detonation of Shell Explosive** Qty 30 Rds . each required for HET and HEI Amn.

- (j) **Checking Destructor for timely and adequate action** Qty 60 Rds each required for HET and HEI Amn.
- (k) **Checking of SD Time** Qty 50 Rds each required for HET and HEI Amn.
- (l) **Pull-off Test** Qty 08Rds each required for HET and HEI Amn

**Note :-**

- (i) Test as mentioned at SI No 5(g) is only for 30mm HET Amn.
- (ii) Rds subjected to Environmental test at SI 5(b)(ii) & (iii) to be used for test at SI 5(e).

6. **Verification of Certificates**. Supplier shall submit following certificates & reports of amn lot from which the samples are offered for evaluation: -

- (a) Certificate of visual and dimensional inspection of complete round.
- (b) Certificate of Conformity of Primer inspection.
- (c) Certificate of Shell inspection and firing tests.
- (d) Certificate of Fuze inspection and firing tests.
- (e) Certificate of Propellant inspection and firing tests.
- (f) Safety certificate mentioning samples offered for trial are safe for handling, transportation and firing / disposal.
- (g) Certificate of accreditation of the laboratory from where testing results have been obtained from a recognised national/ international body.

**Note :-**

Physical verification of parameters claimed in CoC may be carried out depending on availability of test facilities in Proof Ranges/ nominated labs in India.

7. **Visual Inspection, Dimensions and Weight Inspection**. Visual inspection of package / round and dimensions and weight inspection of the round to be conducted for following aspects:-

Ser No	Item under Inspection	Qty to be Inspected	Method of Inspection	Requirements	Remarks
(i)	Packages	Boxes	Visual Inspection	(i) Method of Packing. (ii) Marking/ Stencilling on Packing. (iii) UN Hazard Division/ Compatibility Group.	Vendor to provide Drgs / details of Marking / Stencilling on Packing & Round
(ii)	Complete Round	HEI 200 Rds  HET	Visual Inspection	Visual Inspection will cover checking of following minimum Parameters :- (aa) Dent, damage, deep tool marks / scratch mark. (ab) Corrosion of basic	Vendor to give DCL and AQL as per internationally accepted norms

		200 Rds		metal. (ac) Checking of no rotation of Projectile in Cartg Case (ad) Discoloration / swelling / bulging of Cartg Case (ae) Proper fixing of Driving Bands. (af) Marking/ Stencilling on Round.	
			<b><u>Gauging Inspection</u></b>		
(iii)			(i) Chamber gauging of Complete Rd	(aa) All Rds should satisfy chamber gauging	Gauges available for testing of indigenous OT lots production would be utilised.
			(ii) Gauging for overall length of the Rds.	Checking Height of Rd 30mm HET & HEI Amn. Details to be given by the Vendor	Height gauge to be provided by the Vendor.
			(iii) Intrusion / Protrusion of primer.	(ac) Protrusion of Primer is not allowed. Intrusion of Primer should be between 0.05 to 0.49 mm	Intrusion/ Protrusion Gauge of Primer available for testing of indigeneous OT lots production would be utilised
(iv)			Mass of Complete Round.	Mass of the Round should be as per the Vendor specifications	Vendor to provide the required details/ specification.
(v)	Complete Round	Ø5 08 Rds from each lot.	Pull-off force of Projectile from Cartg Case	Pull-off load and Propellant Charge mass as per Vendor specifications	Vendor to give DCL and AQL as per internationally accepted norms

**Note :-** In addition to the above, any other visual/gauging inspection parameters which are part of OEM Specifications to be provided alongwith methodology of testing , details of acceptance and also the required testing facilities to be provided by the Vendor.

## 8. Trial Conditions & Sample Size.

(a) **Environmental Tests.** Environmental Tests will be conducted at any nominated Lab. All the rounds/packages are to be subjected to under mentioned tests as per Specification JSG 0102 (May 1984 edition)/ MIL standards. However, the actual conduct of tests may vary depending upon the infrastructure and facilities available at the nominated lab / nominated venue.. The under mentioned Tests for Packaged Amn to be conducted with live Rounds packed in Service Package :-

(i) **Impact (Vertical) Test** . 01 box.

(ii) **Bounce Test/ Transport Simulation** 01 box.

(iii) **Vibration Test** 01 box. Packages with Rounds subjected to this test are to be tested for Hermetic Sealing Test.

(iv) **Hermetic Sealing Test for Package.** The Packages with Rounds subjected to Vibration Test as per Para 8(a)(iii) above are to be used for this test. The box containing live Rounds will be subjected to **Immersion Test** as per Specification JSG 0102 (May 1984 edition) **or Pressure Tightness Test.**

(iv) Consequent to completion of Environmental Tests, the boxes at SI 8(a) (ii) & (iii) above will be used for SI 5(e) above i.e Checking of Rds for safety & functioning proof.

### Note:-

(i) Facilities for the conduct of the Environmental test as mentioned in Para 8(a) above will be provided by Vendor. In case of non-availability of the facilities at Vendor location, the same can be carried out at DGQA/DRDO/OFB Lab, if available. In case, the test facilities are not available at DGQA/DRDO/OFB Lab then these tests to be carried out at private NABL accredited Lab. The charges for these tests to be paid by Vendor. . In case it is not feasible to evaluate these parameters during DGQA Evaluation then COC will be accepted. The same to be provided by Vendor and should be accompanied by all test results / Certificates from NABL or an internationally recognised / accredited Laboratory.

(ii) OEM in his Technical Offer should confirm that amn subjected to environmental tests is safe for subjecting to dynamic firing or otherwise.

(b) Consequent to completion of Environment Tests and Visual & Dimensional Inspection ,including Hermetic Sealing Test, Rds which are considered fit for firing shall be subjected to Dynamic Firing. However, *Vendor* should cater for reserve Rds in lieu of Rds becoming unfit to fire for dynamic testing as mentioned at Para 9 below.

9. Dynamic Proof & Proof Methodology

SI No	Parameter/Test	Sample size	Weapon /Method of proof	Conditioning if any	Observations	Acceptance criteria / Remarks
(a)	<b>Checking Muzzle Velocity of Shell.</b>	10 + 11 Std	<p>(aa) <b><u>Proof Eqpt</u></b> Proof to be conducted with Pressure Crusher Barrel K2-TK- B 689.000 of 1<sup>st</sup> Qtr.</p> <p>(ab) <b><u>Instrument</u></b> Doppler Radar</p> <p>(ac) <b><u>Mode of Firing</u></b>- Single shot fire.</p> <p>(ad) <b><u>Order of firing:</u></b> Ws+10S+10A (Where Ws = Warmer Rd, S = Std Rd, A = Lot under testing.</p>	The Standard and Proof Amn to be conditioned for 15°C/24h prior to commencement of Proof.	Muzzle Velocity of shell	<p>(a) Mean Muzzle Velocity of shell: 960±10 m/s.</p> <p>(a) Probable error of MV not more than 5 m/s.</p> <p>Note : OEM to provide Std Rds.</p>

SI No	Parameter/Test	Sample size	Weapon /Method of proof	Conditioning if any	Observations	Acceptance criteria / Remarks
(b)	<b>Checking Pressure of Propellant gases</b>	10 + 11 Std	<p>(aa) <b>Proof Eqpt</b> Proof to be conducted with Pressure Crusher Barrel K2-TK- B 689.000 of 1<sup>st</sup> Qtr.</p> <p>(ab) Pressure measurement Instrument : Crusher Gauge, Copper</p> <p>(ac) <b>Instrument</b> Doppler Radar</p> <p>((ad) <b>Mode of Firing</b>- Single shot fire.</p> <p>(ae) <b>Order of firing:</b> Ws+10S+10A (Where Ws = Warmer Rd, S = Std Rd, A = Lot under proof.</p>	The Standard and Proof Amn to be conditioned for 15°C/24h prior to commencement of Proof.	Pressure of propellant gases(Muzzle Velocity for Info only)	<p>(a) Mean Pressure of propellant gases from a group of Rds not to exceed 3600 kgf/Cm<sup>2</sup>.</p> <p>(b) Pressure of propellant gases of individual round not to exceed 3800 kgf/Cm<sup>2</sup>.</p> <p>Note :- OEM to provide StdRds, Crusher Gauge, Copper and Terrage table.</p>



SI No	Parameter /Test	Sample size	Weapon /Method of proof	Conditioning if any	Observations	Acceptance criteria / Remarks
(c)	Checking of Rds for safety and functioning	50 Rds	<p>(i) Proof Eqpt-30mm Gun 2A42</p> <p>(ii) <u>Test Conditions</u>            (aa) Ply wood screen of dimensions 1.5 X 1.5m with a hole of 0.5 X 0.5 m with upper and side shields of length 1.5 m, installed in front of gun at a distance of 7 to 10 m from muzzle end. Alternatively plywood screen of 3 X 3 m with a hole of 0.5 X 0.5 m without shields is allowed.</p> <p>(ab) Two calibrated stop watches are used with scale division value not exceeding 0.1 sec. Stop watches are started on firing the first round and stopped when the first shell in the salvo burst. Mean reading of two stop watches is taken. If the gun causes a stoppage, remaining rounds in the belt are fired in one or two bursts.</p> <p>(iii) Mode of Firing – Automatic Single Burst.</p>	50 Rds at Ambient Temperature	<p>(aa) Stoppage in gun automatic mechanism.</p> <p>(ab) Damage of body and separation of parts of shell.</p> <p>(ac) Pre-mature bursting of shell in bore or in the trajectory</p> <p>(ad) Pre-ignition of charge.</p> <p>(ae) Cross sectional crack in Cartg Case.</p> <p>(af) Leakage of gases</p> <p>(ag) Misfire.</p> <p>(ah) Longitudinal cracks in Cartg Case.</p>	<p>(i) Results are considered satisfactory if following do not occur:-</p> <p>a) Round causes a stoppage in gun automatic mechanism.</p> <p>(ab) Damage of body and separation of parts of shell.</p> <p>(ac) Pre-mature bursting of shell in bore or in the trajectory with the period less than 7.5 second during one burst.</p> <p>(ad) Pre-ignition of charge.</p> <p>(ae) Cross sectional crack in Cartg Case.</p> <p>(af) Leakage of gases in the breech block along the body of Cartg Case and in cartg case to primer joint.</p> <p>(ag) Misfire.</p> <p>(ii) Longitudinal cracks in Cartg Case in the upper half of body or on the shoulder are allowed, provided these do not have detrimental effect on automatic mechanism of gun.</p>

SI No	Parameter/Test	Sample size	Weapon /Method of proof	Conditioning if any	Observations	Acceptance criteria / Remarks
(d)	<b>Consistency</b>	<b>20 Rds</b>	(i) Pressure crusher barrel K2-TKB-689.000 which has not fired over 2000 rds and has initial velocity ( $V_o$ ) loss not exceeding 3% max.  (ii) <b>Mode of Firing:</b> Single shot fire.	Amb temperature	Vertical and lateral dispersion to be recorded.	(i) Vertical plywood sheet at a distance of 1000m. Vertical and lateral dispersion should not exceed 100 cms.  (ii) Testing may be carried out at a distance of 300m. In this case vertical and lateral dispersion should not exceed 30 cms.
(e)	<b>Checking of Tracer for failure free functioning, burning time and visibility of tracer.</b> (For 30mm HET Amn)	20 Rds	(i) On the range in the absence of atmospheric precipitation and low cloudiness. (ii) Mode of Firing: Single shot fire.	Amb Temperature	(i)Tracer Burning Time. (ii)Visibility of Tracer. (iii) Chipping of Tracer. (iv) No-ignition of tracer.	(i) Results are considered satisfactory if the burning time of Tracer is at least 9 sec with satisfactory visibility of tracer. (ii) Following are allowed:-  (aa) Tracer with burning time at least 4 sec not exceeding 10%. (ab) Failure of Tracers (Un ignited) not more than 10%. (ac) Increase in % of Tracers as per para (aa) because of decrease in % of ignition failures as per

						<p>para (ab). (ad) Tracer compositions chippings off in flight are allowed, provided that burning time of tracer and visibility of tracer are met.</p> <p>(ii) Tracer composition chippings-off, resulting in extinguishing of tracer and burning time less than 4s are considered as failure.</p>
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SI No	Parameter /Test	Sample size	Weapon /Method of proof	Conditioning if any	Observations	Acceptance criteria / Remarks
(f)	<b>Checking of lower limit of Arming</b>	10 Rds	(i) Mode of Firing: Single shot fire.  (ii) 3mm thick Al Plate kept at a distance 20-0.5m from ME	Ambient Temp.	Functioning of Fuze after hitting the target.	Fuze should not function on hitting the target.
(g)	<b>Checking of Reliability of Action, Delay Time and for High Order Detonation of Shell Explosive.</b>	30 Rds	(i) Proof Eqpt-30mm Gun 2A42  (ii) <b>Method of Proof</b> (aa) 3mm thick Al Plate kept at a distance $100 \pm 1$ m with plywood screen installed behind the obstacle at a distance of $(0.3 \pm 0.05)$ m  (ab) Mode of Firing: Single shot fire.	Ambient Temp.	Functioning of Fuze after hitting the target.	(i) The fuze should initiate on hitting the plate.  (ii) The shells should burst in front of the plywood screen.  (iii) Screen should be free from Explosive.  (iii) 10 Fuzes to be used to check the fuze delay interval and the high order of detonation.
(h)	<b>Checking Destructor for timely and adequate action</b>	60 Rds	(i) Proof Eqpt-30mm Gun 2A42  (ii) Mode of Firing: Single shot fire.  (iii) Angle of elevation of Gun at least $15^\circ$ .	(a) 20 Rds at normal temperature.  (b) 20 Rds For 04 hours at $+(50 +3)^\circ\text{C}$  (c) 20 Rds For 04 hours at $-(50 +3)^\circ\text{C}$	Obs :-  SD time.	(i) SD failure is not allowed.  (ii) The time required for the SD time is as follows:-  (aa) At normal temperature. - 9 to 14 S (ab) For 04 hours at a temperature of $+(50 +3)^\circ\text{C}$ - 8 to 13 S (ac) For 04 hours at a temperature of $-(50 +3)^\circ\text{C}$ - 10 to 15 S The time of SD time may vary by 10%.

SI No	Parameter /Test	Sample size	Weapon /Method of proof	Conditioning if any	Observations	Acceptance criteria / Remarks
(j)	<b>Checking SD timing.</b>	50 Rds	(i) Proof Eqpt-30mm Gun 2A42  (ii) Mode of Firing: Mode of Firing: Automatic firing in bursts(7 to 10 sheets at high rate)  (iii) Angle of elevation of Gun at least 15°.  (iv) The time is registered the moment the first Rd is fired until the first burst of shell in salve.	(a) 25 Rds For 04 hours at +(50 +3)° C  (c) 25 Rds For 04 hours at -(50 +3)° C	Obs :-  (i) SD time. (ii) Premature functioning in Brl.	The following is not allowed :-  (i) Premature functioning in Brl.  (ii) Exploding in trajectory with time less than 7.5 sec with rounds kept at +(50 +3)° C and less than 9.5s with Rds kept at -(50 +3)° C

10. **Ammunition Requirement.**

- (a) HET - 400 Rds (310+ 90 Reserve Rds) + 22 StdRds
- (b) HEI - 380 Rds (290 + 90 Reserve Rds) + 22 StdRds

11. Following pre-requisites/modalities shall be followed for DGQA Evaluation: -

- (a) ATP to be provided by the Vendor minimum one month prior to conduct of DGQA Evaluation.
- (b) The DGQA Technical Evaluation Programme will be discussed with Vendor in Pre - Trial Meetings. **However, final decision regarding the DGQA Technical Evaluation Programme including all its provisions therein will be that of DGQA.**
- (c) Specific Parameters (as stated above) to be checked / not to be checked will also be decided by DGQA, based on Requirements & Facilities available in India and after discussion in Pre – Trial Meeting.
- (d) DGQA Technical Evaluation will be conducted as per Infrastructure, Facilities, Conditions, Testing / Measurement Methodology, Equipment, Targets, Jigs and Fixtures, Reference Tables, StdRds, Crusher Gauge, Copper Ball and Terrage table, Service Weapons etc. available in Indian Proof Ranges and Testing Laboratories. OEM will have to accept these and all results thereof.
- (e) The vendor will provide the following for DGQA Technical Evaluation at no additional cost: -
  - (i) Targets.
  - (ii) StdRds, Crusher Gauge, Copper Ball and Terrage table.
  - (iii) Jigs and Fixtures.
  - (iv) Gauges and Measurement Instruments.
  - (v) Any other Equipment, as required.
- (f) The vendor may, at its own risk and cost, provide any of the equipment, Jigs / Fixtures etc (as stated above) required for conduct of DGQA Technical Evaluation, if those available in India are not acceptable. However, these will have to be same as that utilized in the OEM's Country and should be supported with requisite Certificates, as required. OEM will be responsible to install / establish these at our Proof Ranges / Testing Laboratories at his cost.

12. **Conclusion.** The DGQA Evaluation Programme is based on GSQR / TOT documents. However, these draft directives are liable to modifications based on the ATP submitted by the vendors, the facilities available at the testing ranges and the discussion with OEM rep(s) during pre-trial meetings.

**ATP FOR PDI/JRI(CHECK PROOF)**

**30mm HEI/HET AMN**

1. **Visual Inspection, Dimensions and Weight Inspection.** Visual inspection of package / round and dimensions and weight inspection of the round to be conducted for following aspects:-

Ser No	Item under Inspection	Qty to be Inspected	Method of Inspection	Requirements	Remarks
(i)	Packages	Boxes	Visual Inspection	(i) Method of Packing. (ii) Marking/ Stencilling on Packing. (iii) UN Hazard Division/ Compatibility Group.	Vendor to provide drgs/details of Marking/ Stencilling on Packing & Round
(ii)	Complete Round	HEI & HET Rds	Visual Inspection	Visual Inspection will cover checking of following minimum Parameters :- (aa) Dent, damage, deep tool marks / scratch mark. (ab) Corrosion of basic metal. (ac) Checking of no rotation of Projectile in Cartg Case (ad) Discoloration / swelling / bulging of Cartg Case (ae) Proper fixing of Driving Bands. (af) Marking/ Stencilling on Round.	The parameters to be checked during Visual Inspection as per existing Defect Classification List (DCL) .

(iii)			<b>Gauging Inspection</b> (aa) Chamber gauging of Complete Rd  (ab) Gauging for overall length of the Rds.  (ac) Intrusion / Protrusion of primer.	(aa) All Rds should satisfy chamber gauging  (ab) Height of Rd 30mm HET/HEI.  (ac) Protrusion of Primer is not allowed. Intrusion to be within the specified limit.	Gauges available for testing of indigenous OT lots production would be utilised.
(iv)			Mass of Complete Round.	Mass of the Round should be as per the specification.	Vendor to provide the required details/ specification.
(v)	Complete Round	08Rds from each lot.	Pull-off force of Projectile from Cartg Case	Pull-off to be within specified limit.	Charge mass of Propellant will be measured for info only. OEM to provide details of Propellant Ch Mass.

## 2. **Static Test .**

- (aa) Pull Off of Projectile from Cartg case - As per Specifications.
- (ab) Checking the air tightness of Packing boxes containing rounds - As per Specifications.

## 3. **Dynamic Proof.**

- (a) **Muzzle Velocity of the Projectile.** Muzzle Velocity of the Projectile and .Probable Deviation of Muzzle Velocity.
- (b) **Powder Gas Pressure.** Mean Max Pressure of Powder gases of the group of Rds and Max Pressure of Powder gases of the individual Rds
- (c) **Checking Safety and functioning of rds.** Checking at high rate and low rate of fire.
- (d) **Checking of Dispersion of hits.** Probable Deviation to be checked.
- (e) **Checking of Failure Free operation, the Burning Time of Tracer and the Visibility of Trajectory.** The Burning Time of Tracer to be checked.



- (f) **Checking of Lower Limit of Arming.** The Fuze must not function on hitting the target placed at specified distance from Muzzle end.
- (g) **Checking of Fuze for Reliability of Action.** The Fuze must function on hitting the target placed at specified distance from Muzzle end.
- (h) **Checking Destructor for timely and adequate action.** Fuze must function within the specified time limit.
- (i) **Checking of Fuze Safety.** Fuze must function within the specified time limit.

4. **Shelf Life.** Shelf Life of Amn will be certified by the Vendor on Certificate of Conformance (CoC) accompanied by Lab Reports, Test Results & Methodology of Assessment. The same is liable to be confirmed by DGQA by ISAT Trial or by any other available means.

5. In addition to above, any other technical parameters considered essential by DGQA

**METHODOLOGY OF USER TRIALS OF 30 mm HEI/HET AMMUNITION**

1. The trials are envisaged to be conducted in **Summers and Winters** as per the operating temperature ranges specified and mentioned in subsequent paragraphs. Each trial will be carried out from **three** BMPs provided by the nominated trial unit. In addition, one BMP will be kept as reserve. The same BMPs will be used for both in-service and Indian Industry ammunition. Zeroing of these BMPs will be carried out as per standard procedure.

2. Scope of user trials will be restricted to comparing the performance with in-service ammunition wrt ease of handling (belting of ammunition, rate of stoppages, heating of brl, breakage of gun parts, damage to cart case etc) and performance of the ammunition at different ranges. The following tests are to be carried out during the conduct of each trial:-

- (a) **Belting & Feeding.** 340 x Rounds belted using in-service belt filling machine, existing links and rounds ex Indian Industry ammunition will be loaded in gun chamber.
- (b) **Stoppage Rate Test.** As per firing practices mentioned in **Annexure 1**.
- (c) **Dynamic Firing Test.** To test the ammunition in different modes and at different ranges. The details of firing practices are mentioned at Annexure 1.

3. **Methodology of Conduct.** The methodology to conduct the firing practices as mentioned at Annexure 1 will be as followed:-

(a) **Trials & Temperature Range.** Summer and winter trials are envisaged to be conducted as per the temperature ranges mentioned below:-

- (i) Summer Trials - Between 40<sup>0</sup>C to 45<sup>0</sup>C
- (ii) Winter Trials - Between 0<sup>0</sup>C to 5<sup>0</sup>C

(b) **Preparation of Equipment and Conduct of Checks.** Nominated equipment will be certified for serviceability by dependent workshop. A certificate confirming suitability of ammunition was safety will be given by CQA (Ammunition) before commencement of the trials.

(c) **Crew.** Same crew will be used for firing both the in-service ammunition and the ammunition offered by Indian Industry from the same ICV.

(d) **T&A and Zeroing.** T&A and zeroing of the 30mm Cannon will be carried out as per the existing procedure before commencement of firing using the in-service AP ammunition. Zeroing of 30 MM Canon will be confirmed after firing of each type of ammunition.

(e) **Dynamic Firing.** Out of three BMPs, two will be used for firing at different ranges from 500m to 4000m. Each BMP will fire a belt of 255x HE(I) and 85xHE(T) rounds in ration of 3 x HE (I) : 1 x HE(T). Practices are given at **Annexure 1.**

(f) **Stoppage Rate Test.** The third BMP will be used for stoppage rate test by firing 340 rounds (3:1) ratio of HE (I) and HE (T) at Rapid Rate and Controlled Burst as well as to ascertain the visibility of tracer at night. The Practices are given at **Annexure1.**

(g) **Target.** Firing will be carried out on ground targets suitably demarcated with white lime. The dimension of the targets will be same for both the in-service and Indian Industry ammunition. The targets will be refreshed on as required basis. Zeroing targets will be the standard registration target.

(h) **Evaluation.** Visual estimation of the hits falling on the target will be made. Hits pattern will be recorded after each practice. OIC trials will ensure that aiming mark of targets is so marked that same aiming mark is selected for firing both in-service and Indian Industry ammunition.

(j) **Ammunition.** A total number of the following rounds will be required of both in-service and Indian Industry ammunition will be required:-

- (i) HE(I) - 1530.
- (ii) HE(T) - 510.
- (iii) AP(T) - 400.

(k) Following will be recorded for both in-service and Indian Industry ammunition:-

- (i) Number of stoppages and Number of rounds fired after which stoppage has occurred.
- (ii) Nature of stoppage.
- (iii) Damage to weapon due to firing. Inspection will be carried out by CQA (Wpns) and EME (dependent workshop). Number of rounds fired after which damage has occurred will be recorded.
- (iv) Type of damage to cart case.
- (v) Heating of weapon body.

(vi) Gaseous fumes generated inside fighting compartment due to firing.

(vii) Other details at gun end and target end as mentioned at **Annexure 1 to this Appx.**

**Annexure 1 (Refer  
to Para 3K (vii) of Appx D**

**DYNAMIC FIRING  
(SUMMER & WINTER TRIALS)**

**One BMP-2 & BMP-2K: Ground Targets Suitably Demarcated with Lime**

<b>Ser</b>	<b>Prac</b>	<b>Day/ Night</b>	<b>Range( m)</b>	<b>No of Round</b>	<b>Total Rounds</b>	<b>Remarks</b>
1.	Zeroing	Day	100	20 (AP(T))	4X20=80 (AP(T))	To be carried out before firing each type of ammunition as per std procedure. Same lot of AP(T) amn be used for zeroing.
2.	Single Shot	Day	500	10	10	<b><u>Aspects to be checked and recorded during firing of each practice.</u></b>  <b><u>Physical Aspects.</u></b>  (a) Suitability and ease of packing and carriage. (b) Recognition by day and night. (c) Ease of belting of ammunition. (d) Smooth ejection and feeding of ammunition/belts.  <b><u>At the Gun end.</u></b>  (e) Any damage to the gun/parts or in fighting compartment. (f) Ease of handling of gun. (g) Number of stoppages/ease of removal of stoppages. (h) Damage to the ammunition/cart case. (j) Smoke and Flash observed if any.
3.	Slow Rate	Day	500	20	30	
4.	Rapid Rate	Day	500	30	60	
5.	Single Shot	Day	2000	10	70	
6.	Slow Rate	Day	2000	20	90	
7.	Rapid Rate	Day	2000	30	120	
8.	Single Shot	Day	3000	10	130	
9.	Slow Rate	Day	3000	20	150	
10.	Rapid Rate	Day	3000	30	180	
11.	Single Shot	Day	4000@	10	190	
12.	Slow Rate	Day	4000@	20	210	
13.	Rapid Rate	Day	4000@	30	240	

						<p>(k) Any excessive deposition in the chamber.  (l) Heating of barrel.  (m) Cook off of ammunition.</p> <p><b><u>At Target end.</u></b></p> <p>(n) No of hits.  (o) Recording of Hit pattern.</p> <p>@Max Range as avlb</p>
14.	Rapid Rate	Day	Alt-2000m Slant Range-2500m	100	340	Aerial Target Engagement (same target to be used for both in-service and Indian Industry ammunition)
<b><u>BMP-2/2K (Stoppage Rate Test): Ground Targets Suitably Demarcated with Lime</u></b>						
15.	Zeroing	Day	100	20 AP(T)	20 AP(T)	To be carried out before firing each type of ammunition as per std procedure. Same lot of AP(T) amn be used for zeroing.
16.	Rapid/rate Controlled Burst	Ni	2500	340 HE(I):HE(T) ) 3:1	340	Stoppage Rate Test and to check visibility of tracer at Ni.