(Cover Page)

सत्यमेव जयते
Ministry of Defence
Government of India

REQUEST FOR PROPOSAL
BY
MINISTRY OF DEFENCE
GOVERNMENT OF INDIA
FOR PROCUREMENT OF
QUANTITY 930 FAMILY OF SOFTWARE DEFINED RADIO SETS COMPRISING HAND HELD RADIO SETS, MANPACK RADIO SETS AND VEHICLE BASED RADIO SETS THROUGH FAST TRACK PROCEDURE (FTP)

CATEGORY: BUY (INDIAN)

This document contains 103 pages including cover page and Appendices.

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File No : 86785/3/SDR/Inf10B

Directorate General of Infantry
Infantry - 10
Room No, 409, D-1Wing
4th Floor, Sena Bhawan
Integrated Head Quarters of MoD (Army)
New Delhi-110011

30 Dec 2022

To

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REQUEST FOR TECHNICAL AND COMMERCIAL PROPOSAL FOR PROCUREMENT OF QUANTITY 930 FAMILY OF SOFTWARE DEFINED RADIO SETS COMPRISING HAND HELD RADIO SETS, MANPACK RADIO SETS AND VEHICLE BASED RADIO SETS THROUGH FAST TRACK PROCEDURE (FTP)

CATEGORY: BUY (INDIAN)

Dear Sir/Madam,

1. The Ministry of Defence, Government of India, intends to procure quantity 930 Family of Software Defined Radio Sets comprising 456 x Hand Held Radio Sets, 314 x Manpack Radio Sets and 160 x Vehicle based Radio Sets through Fast Track Procedure (FTP) under Buy (Indian) category and seeks participation in the procurement process from prospective Bidders subject to requirements in succeeding paragraphs.

Synopsis

2. **Broad Description of Equipment/System**. As per Appendix A to the RFP.

3. The salient aspects and timelines of the acquisition are tabulated below. In case of any variation in the details furnished below or in any Annexures(s) with that mentioned in the RFP, information furnished in the main body of the RFP at referred Paragraph is to be followed.

Ser No.	Description	Details	Reference Para of the RFP
(a)	Equipment/System required	FAMILY OF Software defined Radio Sets to include Hand Held Radio Sets, Manpack Radio Sets and Vehicle based Radio Sets	Para 1 of the Cover Note to the RFP
(b)	Quantity Required	456 - Handheld SDR Sets, 314 - Manpack SDR Sets and 160 - Vehicle Based SDR Sets	
(c)	Categorisation of Procurement	Buy (Indian)	

(d)	Minimum IC Content required	In case of indigenous design ≥ 50%, otherwise ≥ 60%	Para 7 of RFP
(e)	Place(s) of Delivery	SDR Sets – Leh, MRLS, SMTs/STEs, Training Zigs & other product support – COD, Agra	Para 1.1.1 of Appendix G
(f)	Warranty Period	24 Months from completion of JRI	Para 11 and Appendix C of RFP
(g)	EMD Amount	**Seventy (70) Lakhs**	Para 19 of RFP
(h)	Last date for submission of Pre-bid queries	05 Jan 2023.	Para 21 of RFP
(j)	Date and time for Pre-bid meeting	09 Jan 2023 at 1500Hrs.	Para 22 of RFP
(k)	Last date and time for Bid Submission	By 1500 Hrs on 13 Jan 2023	Para 23 of RFP

4. This Request for Proposal (RFP) consists of following four parts:-

Ser No.	Description	Page No.
(a)	Part I – General Requirements	6-10
(b)	Part II - Technical Requirements	11-14
(c)	Part III – Commercial Requirements	15
(d)	Part IV – Bid Evaluation and Acceptance Criteria	16

5. The Government of India invites responses to this request only from Original Equipment Manufacturers (OEM) or Authorised Vendors or Government Sponsored Export Agencies (applicable in the case of countries where domestic laws do not permit direct export by OEM) subject to the condition that in cases where the same equipment is offered by more than one of the aforementioned parties, preference would be given to the OEM.

6. The end user of the equipment is the Indian Armed Forces.

7. This RFP is being issued with no financial commitment; and the Ministry of Defence reserves the right to withdraw the RFP and change or vary any part thereof or foreclose the procurement case at any stage. The Government of India also reserves the right to disqualify any Bidder should it be so necessary at any stage on grounds of National Security.

8. This RFP is non-transferable.

9. In addition to various Appendices and their Annexures, attached with this RFP, reference to various paragraphs of DAP-2020 has been made in the RFP. The DAP -2020 is an open domain document that is available at GoI, MoD website www.mod.nic.in.

10. The receipt of the RFP may please be acknowledged.

Yours faithfully

(Rajeev Chhibber)
Major General
Chairman
Empowered Committee

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Disclaimer

This RFP is neither an agreement and nor an offer by the MoD to the prospective Bidders or any other person. The purpose of this RFP is to provide interested parties with information that may be useful to them in submitting their proposals pursuant to this RFP. This RFP includes statements, which reflect various assumptions and assessments arrived at by the MoD in relation to the Project. This RFP document and any assumptions, assessments and statements made herein do not purport to contain all the information that each Bidder may require. The Bidder shall bear all its costs associated with or relating to the preparation and submission of proposal pursuant to this RFP. Wherever necessary, MoD reserves the right to amend or supplement the information, assessment or assumptions contained in this RFP. The MoD reserves the right to withdraw the RFP or foreclose the procurement case at any stage. The issuance of this RFP does not imply that the MoD is bound to shortlist a Bidder for the Project. The MoD also reserves the right to disqualify any Bidder should it be so necessary at any stage on grounds of National Security.

PART I – GENERAL REQUIREMENTS

1. This part consists of the general requirement of the Goods (also referred as equipment/systems/deliverables) and Services, hereafter collectively referred as 'Deliverables', the numbers required, the time frame for deliveries, conditions of usage and maintenance, requirement for training, Engineering Support Package (ESP), and warranty conditions, etc. It includes the procedure and the date & time for submission of bids.

Non-Disclosure

2. The Bidding documents, including this RFP and all attached documents provided by the MoD, are and shall remain or become the property of the MoD. These are transmitted to the Bidders solely for the purpose of preparation and the submission of a proposal in accordance herewith. Bidders are to treat all information as strictly confidential and shall not use it for any purpose other than for preparation and submission of their proposal. The provisions of this Para shall also apply mutatis mutandis to Bids and all other documents submitted by the Bidders, and the MoD will not return to the Bidders any proposal, document or any information provided along therewith (except unopened Commercial Bid and EMD, as relevant).

3. Information relating to the examination, clarification, evaluation and recommendation for the Bidders shall not be disclosed to any person who is not officially concerned with the process, or concerning the Bidding Process. The MoD will treat all information, submitted as part of the Bid, in confidence and will require all those who have access to such material to treat the same in confidence. MoD may not divulge any such information unless it is directed to do so by any statutory entity that has the power under law to require its disclosure or is to enforce or assert any right or privilege of the statutory entity and/ or MoD or as may be required by law or in connection with any legal process.

4. **Confidentiality of Information**. No party shall disclose any information to any 'Third Party' concerning the matters under this RFP generally. In particular, any information identified as 'Proprietary' in nature by the disclosing party shall be kept strictly confidential by the receiving party and shall not be disclosed to any third party without the prior written consent of the original disclosing party. This clause shall apply to the sub-contractors, consultants, advisors or the employees engaged by a party with equal force.

Business Eligibility

5(a). **Undertaking by Bidders**. The Bidder will submit an undertaking that they are currently not banned / debarred / suspended from doing business dealings with Government of India / any other government organisation and that there is no investigation going on by MoD against them. In case of ever having been banned / debarred / suspended from doing business dealings with MoD/any other government organization, in the past, the Bidder will furnish details of such ban / debarment along with copy of government letter under which this ban / debarment / suspension was lifted / revoked. The Bidder shall also declare that their sub-contractor(s)/supplier(s)/technology partner(s) are not Suspended or Debarred by Ministry of Defence. In case the sub-contractor(s)/supplier(s)/ technology partner(s) of the Bidder are Suspended or Debarred by Ministry of Defence, the Bidder shall indicate the same with justification for participation of such sub-contractor(s)/supplier(s)/ technology partner(s) in the procurement case.

5(b). Subsequent to submission of bids if any sub-contractor(s)/supplier(s)/technology partner(s) of the Bidder is Suspended or Debarred by Ministry of Defence, the Bidder shall intimate the Ministry of Defence regarding Suspension or Debarment of its sub-contractor(s)/ supplier(s)/technology partner(s) within two weeks of such order being made public.

6. **Pre-Qualification Criteria.** The detailed Pre-Qualification criteria for the Bidders for participation in the instant procurement case are placed at **Appendix K** to this RFP. All Bidders are to submit details as per the criteria along with the Technical Bids. These would be evaluated by the Empowered Committee.

7. **Indigenous Content**. For the purposes of this RFP and the acquisition contract (if any) signed by the Ministry of Defence with a successful Bidder, indigenous content shall be as defined under **Para 9 of Chapter I** and **Para 1** of **Appendix B** to **Chapter I** of DAP **2020**. In addition, reporting requirements for prime (main) Bidders (and for sub-contractors/suppliers /technology partners reporting to higher stages/tiers) shall be as prescribed under **Para 4 to 7** of **Appendix B** to **Chapter I** of DAP **2020**. The right to audit Bidder/ sub-contractors/suppliers /technology partners shall vest in the Ministry of Defence as prescribed under **Para 10**; and aspects of delivery, certification, payments, withholding of payments and imposition of penalties shall be as prescribed under **Para 11** to **15** thereof. Furthermore, Bidders in 'Buy (Indian)', will be required to submit their indigenisation plan in respect of indigenous content as stipulated in **Para 4 to 7**of **Appendix B** to **Chapter I** and **Para 39** of Chapter II of DAP 2020. The DAP 2020 is available at MoD, GoI website (www.mod.nic.in) for reference and free download.

8. **Year of Production**. Deliverables supplied under the contract should be of latest manufacture i.e manufactured after the date of Contract with unused components/assemblies/sub-assemblies, conforming to the current production standard and should have 100% of the defined life at the time of delivery. Deviations, if any, should be clearly brought out by the Bidder in the Technical Proposal.

9. **Delivery Schedule**. The delivery schedule of equipment and services along with the relevant payment stages is specified at **Annexure V to Appendix G**.

10. Once the contract is concluded and the delivery schedule is established, the Bidder shall adhere to it and ensure continuity of supply of deliverables and their components under the contract.

11. **Warranty**. The deliverables supplied shall carry a warranty for 24 months. Commencement of warranty will be from the date of acceptance post JRI. Warranty Clause is given at **Appendix C** to this RFP.

12. **In Service /Shelf Life**. The In Service Life of the deliverables shall be Ten years. Supporting documents in respect of reliability model, prediction and environmental evaluation as per applicable standards mentioned on OR/SQR shall be submitted (Refer QAI for QA methodology as per JSG 0824:2022).

13(a). **Product Support**. The Bidder would be bound by a condition in the contract that he is in a position to provide product support in terms of maintenance, materials and spares for a minimum period of 10 years. Even after the said mandatory period, the Bidder would be bound to give at least two years notice to the Government of India prior to closing the production line so as to enable a Lifetime Buy of all spares before closure of the said production line. This, however, shall not restrict the Buyer from directly sourcing sub-equipment/sub-assembly and spares from their respective OEMs/sub-vendors on completion of warranty. In case the sub-equipment/sub-assembly/parts require tuning/calibration/integration by the Bidder prior replacement, the same is to be undertaken by the Bidder at fair and reasonable cost, as mutually agreed between Buyer and Bidder. Joint Defect Investigation to be carried out as per latest version of JSG 0309

13(b). **Codification**. The Bidder agrees to provide existing NATO Stock Numbers (NSNs) of OEM for each item supplied under the contract as per part list (including MRLS). In case, the NSNs are

not available, the bidder agrees to codify using basic technical characteristics as required for codification in consultation with MoD/Directorate of Standardisation. In case of IPR issues, codification will be undertaken as Type IV codification (where only the manufacturer details and part number are to be provided).

14. **Obsolescence Management Plan.** An actionable obsolescence management plan is to be proposed by the Bidder along with the mechanism for intimation of notification of obsolescence. The modalities of the mechanism for intimation of notification would be deliberated during CNC. The mutually agreed mechanism for intimation would form an integral part of the contract. All upgrades and modifications carried out on the equipment during the next 10 years must be intimated to the SHQ as per the agreed mechanism.

15. **Training of Crew and Maintenance Personnel**. A training package for training of operators, operator trainers and maintenance personnel to undertake operation and maintenance of equipment, along with tools and test jigs and training of QA personnel for Quality Assurance of equipment would be required to be carried out in English language and Hindi language (if required). This training shall be designed to give the operators and maintainers necessary knowledge and skills to operate & maintain equipment at O & I' level. The syllabus will be defined by the Bidder in consultation with the Buyer at the time of MET. The maintenance training will be imparted to the satisfaction of the Buyer and Bidder will ensure that the training content and period will be to impart working proficiency up to the required level. All training requirements such as training aids, projection system, complete equipment with accessories / optional, technical literature, spares, test equipment / test set up, charts, training handouts, power point presentations, Computer Based Training (CBT), Documentation, Simulators etc will be catered by the Bidder.

Ser No	**Service / Directorate**	**Location**	**Duration (No of Working Days per Batch)**	**No of Batches**	**Total No of Personnel**	**Remarks**
Crew Training						
(a)	User	User Designated / Location	10	07*	400 Leh – 280 Mathura- 120	* Five batches in Leh, Two Batches in Mathura
Maintenance Training to include EME, QA & OS Personnel						
(b)	Field Level Training	OEM Premises	06	02	30	Two batches of 15 persons each with a gap of 18 months
(c)	'I' Level Training	OEM Premises	12	01	04	
QA & OS						
(d)	QA Training	Vendor Premises	03	01	02	All in one batch
(e)	OS Training (Maintenance Personnel)	User Designated / Location	03	01	02	All in one batch along with User Training

Note:

1. All types of training (less QA & OS personnel) will be completed within two months of completion of JRI of first lot of equipment and Training of QA & OS personals to be completed prior to PDI.

2. Maintenance Training: The maintenance training should meet the needs of repair and maintenance of the complete equipment, use of SMTs/ STEs, test set up, assemblies/ sub-assemblies as per the stipulated repair philosophy. In addition to training on operation and diagnosis using STEs, training would also cover repair of STEs using procured spares for STEs. Training content should be commensurate with the proposed Permissible Repair Schedule (PRS). The training should bring out utilization of provided MRLS items including procedure of their fitment/ repair. A movie should be made of entire training class with titles for reference in future. Movie should also include stepwise use of SMTs/ STEs.

16. **Government Regulations**. It may be confirmed that there are no Government restrictions or limitations in the country of the Bidder or countries from which subcomponents are being procured and/or for the export of any part of the deliverables being supplied.

17. It may be further confirmed that all national and international obligations relevant to transfer of conventional arms of the country of the supplier or countries from which parts and components are being procured, have been taken into account for the duration of the contract. Accordingly, thereafter there would be no review, revocation or suppression of Defence export licence and other related clearance issues to the supplier for the contract that could impinge on the continuity of supply of items and their parts or components under the contract.

18. **Patent Rights.** The Bidder should confirm that there are no infringements of any Patent Rights in accordance with the laws prevailing in their respective countries.

19. **Integrity Pact**. In the subject RFP, the Bidder is required to sign and submit Pre Contract Integrity Pact (PCIP) given at **Annexure I to Appendix J** to this RFP and EMD of Rupees Seventy (70) Lakhs.

20. **Fall Clause**. If the equipment being offered by the Bidder has been supplied/ contracted with any organisation, public/private in India, the details of the same may be furnished in the technical as well as commercial offers. The Bidders are required to give a written undertaking that they have not supplied/is not supplying the similar systems or subsystems at a price lower than that offered in the present bid to any other Ministry/Department of the Government of India and if the similar system has been supplied at a lower price, then the details regarding the cost, time of supply and quantities be included as part of the commercial offer. In case of non-disclosure, if it is found at any stage that the similar system or subsystem was supplied by the Bidder to any other Ministry/Department of the Government of India at a lower price, then that very price, will be applicable to the present case and with due allowance for elapsed time, the difference in the cost would be refunded to the Buyer, if the contract has already been concluded.

Bid Timelines

21. Any queries/clarifications to this RFP may be sent to this office by 05 Jan 2023 (date). A copy of the same may also be sent to:-

Directorate General of Infantry (Inf-10),
General Staff Branch, Room No 409,
D-I Wing, Sena Bhawan,
IHQ of MoD (Army),
DHQ PO, New Delhi – 110011
(Tele / Fax No 011-23032866**)"**

22. **Pre-Bid Meeting**. A pre-bid meeting will be organised by SHQ at 1500 hrs on 09 Jan 2023 (date) at Infantry Directorate Conference Hall to answer any queries or clarify doubts regarding

submission of proposals. The Bidder or his authorised representative is requested to attend. Necessary details may be sent a week in advance to **Directorate General of Infantry (Inf-10), (Address as per Para 21 of RFP)** to facilitate obtaining of security clearance.

23. **Submission of Bids**. The Technical and Commercial Proposals along with IP and EMD should be sealed separately in three separate envelopes clearly indicating Commercial/ Technical/ IP and any other Bank Guarantee, as applicable, and then put in one envelope and sealed **(all the envelopes should clearly state the letter No of RFP and the name of equipment and Bidder name)** and submitted to the undersigned at the following address by 1500 Hrs on 13 Jan 2023 :-

Directorate General of Infantry (Inf-10),
General Staff Branch, Room No 409,
D-I Wing, Sena Bhawan,
IHQ of MoD (Army),
DHQ PO, New Delhi – 110011
(Tele / Fax No 011-23335545)"

24. Offer opening by an Offer opening committee will be held at 1100 hrs on 16 Jan 2023 at the same venue as indicated at Para 23 above. The Bidder or his authorised representative is welcome to be present at the opening of the proposals. Necessary details may be sent atleast one week in advance to facilitate obtaining of security clearance.

PART II – TECHNICAL REQUIREMENTS

25. The second part of the RFP incorporates the aspects of ORs describing the technical parameters of the proposed equipment, and the environmental parameters for functioning. The operational characteristics and features that should be met by the equipment are elucidated at **Appendix A** to this RFP and the Compliance Table at **Appendix B** to this RFP. The Bidder would be required to offer Quantity Four set each of Family of SDR (Four Hand Held Radio Sets, Four Man pack Radio Sets and Four Vehicle Based Radio Sets) at Buyers Nominated Location for Demonstration on a "No Cost No Commitment" basis.

26. **Operational Characteristics and Features**. The broad operational characteristics and features that are to be met by the equipment are elucidated at **Appendix A** to this RFP.

27. **Technical Offer**. The Technical Offer must enable detailed understanding of the functioning and characteristics of the equipment as a whole and each sub system independently. It must include the performance parameters as listed at **Appendix A** to this RFP and any other information pertaining to the technical specifications of the equipment considered important/ relevant by the Bidder. The technical proposal should also include maintenance schedules to achieve maximum life and expected life of each assembly/ sub assembly (or Line Replaceable Unit (LRU)/Shop Replaceable Unit (SRU)), storage conditions/environment condition recommended and the resultant guaranteed in-service/shelf life, The range and depth of spares included in the proposal should be supported by necessary reliability and prediction model or authenticated by past data on the similar equipment in use. Any Bidder found to be providing lesser ESP/MRLS in terms of range and depth will have to make good the deficiency at no extra cost.

(a) Bidder needs to submit template for the list of systems/sub-systems as per 'Annx XV to QAI'.

(b) Ready reference user hand book for operation of equipment/ wpn shall be provided in technical bid by Seller/Bidder.

(c) Qualification tests for environmental evaluation (Applicable specs with test class, tests procedures and test severities & Acceptance tests with AQLs) to be endorsed in draft ATP in the tech offer by Bidder.

(d) Certificate of Conformance (CoC) supported by test reports from NABL accredited lab/ Internationally accredited/government designated labs which can be submitted by Bidder during TEC/NCNC-Demo stage as well as during PDI may be listed in technical offer.

(e) Test facilities available with Bidder/OEM/OES such as special test equipment/ Fixtures etc shall also be endorsed in tech offer if available.

28. If there is any associated optional equipment on offer that should also be indicated separately along with the benefit that are likely to accrue by procuring such optional equipment. Should the Bidder be contemplating any upgrades or modifications to the equipment being offered, the details regarding these should also be included in the Technical Proposal.

29. **Technical Details**.

(a) The technical details should be factual, comprehensive and include specifications of the offered system/equipment against broad requirements listed in **Appendix A** to this RFP.

(b) Insufficient or incomplete details may lead to rejection of the offer. Mere indication of compliance may be construed as incomplete information unless system's specific technical details are available in the offer. A format of the compliance table for the technical parameters and other commercial conditions of RFP including the Operational Characteristics and Features is attached as **Appendix B** to this RFP.

30. The technical offer should have a separate detachable compliance table as per format given at **Appendix B** to this RFP stating specific answers to all the parameters as listed at **Appendix A** to this RFP. It is mandatory to append answers to all the parameters listed in **Appendix A** to this RFP. Only one copy of the Technical Proposal should be submitted (along with one soft copy), also only one copy of the commercial proposal is required.

31. **Malicious Code Certificate**. The Bidder is required to submit a **'Malicious Code Certificate'** ***(only for Electronic items and Software)*** along with the Technical Proposal. The format is placed at **Appendix D** to this RFP.

32. **Demonstration**.

(a) The Bidder is requested to confirm his willingness to provide Qty Four set each of family of SDR (Four Hand Held Radio Sets, Four Manpack Radio Sets and Four Vehicle Based Radio Sets each) at Buyers Nominated Location for Demonstration to the Empowered Committee or the representative nominated by the Empowered Committee under Vendor's / OEM arrangements to confirm compliance to the Operational Characteristics and Features (as given in Appendix A to this RFP) on "No Cost No Commitment" basis when so requested as per demonstration methodology given at **Appendix F**. The Buyer, at his own expense, will depute its representatives for the demonstration. If any part of the demonstration are conducted in the Buyer's facilities, the Bidder shall depute his personnel and equipment at his own expenses and bear the cost of all expenses of trials other than the cost of ranges, platform or facilities which the Buyer may choose to provide free of cost. Demonstration methodology is attached as **Appendix F** to this RFP.

(b) **Demonstration of Maintenance Aspects**. In order to maintain the equipment in field Army, maintenance related aspects shall be demonstrated by vendor with associated equipment/ accessories. Following aspects to be included in the demonstration: -

(i) Technical Literature to include User Hand Book, Technical Manuals, ISPL, MRLS, Technical Manuals on STEs, details of training aggregates, CBTs. IETMS for training of technicians for maintenance.

(ii) SMTs and STEs.

(iii) Tree Diagram to include demo of assemblies/ sub-assemblies.

33. **Product Support (ESP)**. After induction, the equipment/system would be repaired and maintained as per the repair and maintenance philosophy at **Appendix E** to this RFP. The information on Engineering Support Package that is required to be provided is enclosed at **Annexure I** to **IV** to **Appendix E** to this RFP. Product support beyond I level will be undertaken by the vendor. After completion of two(02) years of warranty, the Maintenance Support by in-house agency for **'O' level and 'I' level** repair using procured Engineering Support Package (ESP) will be undertaken as per the repair and maintenance philosophy att at **Appendix E to this RFP**. The information on Engineering Support Package that is required to be provided is enclosed at **Annexure I to IV to Appendix E to this RFP**. **Beyond 'I' level,** repairs will be undertaken by the OEM. Separate

contract for the same will be concluded. An undertaking will be taken from the vendor to provide spares and ESP related support throughout the lifecycle of the equipment.

34. **Spares**. The spares requirement will be as per **Appendix E** to this RFP. The spares are required to be categorized in four categories as follows:-

(a) Manufactured by Bidder as OEM and can be sourced as per Part No.

(b) Bought out items and customized by OEM for the specific purpose and such customization would require OEM intervention.

(c) Bought out from other OEMs/Third Party as specialised items and used without any customization. Such items can be sourced by quoting their Part No./Identification No. as given by OEM/Third Party and directly utilised.

(d) General Engineering items/ COTS which can be sourced by stating the relevant standards and item description.

Note. *The OEM Part No. /Identification No. of items in addition to bidder assigned part number are also required to be given. To the extent feasible, NATO Stock Number (NSN) be also provided.*

35. As brought out at Para 27, the range and depth of spares included in the proposal should be supported by necessary reliability and prediction model or authenticated by past data on the similar equipment in use. These would be evaluated during Demo. Any Bidder found to be providing lesser ESP/MRLS in terms of range and depth will have to make good the deficiency at no extra cost. The revised list of MRLS to this effect is to be submitted during Demo. The Buyer would also have the option to amend the MRLS proposed by the Bidder within **(02) Two** years of the expiry of the warranty period. The Bidders would either 'Buy Back' the spares rendered surplus or exchange them on cost to cost basis with the spares as required by the Buyer. The said spares would be purchased/ replaced by the Bidder, based on the prices negotiated in the contract.

36. **Active Technology Obsolescence Management.** Bidder is to indicate the methodology on how the Bidder intends to undertake Active Obsolescence Management through life cycle of equipment which would include upgradation of system/ subsystem/ units on completion of its fair service life. The Bidder/OEM shall also intimate Buyer on likely technology obsolescence of various sub-assemblies/units/modules of equipment through an Annual Bulletin. In case of impending obsolescence of components, bulletin should specify either alternate item or option for life-time buy as under:-

(a) The Bidder/OEM will notify the Buyer not less than two years before the closure of its production line about the intention to close production of equipment for provision of purchasing spare parts, before closure of the said production line.

(b) Three years prior to completion of design/service life of equipment, the Bidder/OEM will submit techno-commercial proposal for upgradation of equipment, wherever applicable, to mitigate technology obsolescence and for ensuring product support for next 10 years.

Evaluation of Technical Offers

37. The Technical Offer submitted by the Bidder will be evaluated by Empowered Committee (EC) to confirm that the equipment being offered meets all the Essential Parameters of the RFP including Operational Requirements as elaborated in this RFP at **Appendix A**. Thereafter, the

vendors of the short-listed equipment would be asked to demonstrate the compliance of their equipment with the Operational Requirements given in Appendix A to this RFP to the Empowered Committee or the representative nominated by the Empowered Committee at Buyers Nominated Location on 'NCNC' basis.

38. Commercial offers will be opened only of Bidders whose equipment is found Technically and demonstration compliant by the Empowered Committee or the representative nominated by the Empowered Committee.

Quality Assurance Instructions & Technical Evaluation Plan

39. Bidder is to submit a Draft Acceptance Test Procedure (ATP) along with the Technical bid or at the time of Demonstration, as per the QA instructions and Technical Evaluation Plan. Based on the draft ATP, the ATP will be finalised by the Buyer's QA agency with Bidder in consultation with the User during CNC. ATP will be finalised at the CNC stage. ATP shall be included in the contract at the time of finalisation with successful bidder. ATP will lay down the tests to be carried out during PDI and JRI. It shall be ensured that there are no repetition of QA tests in PDI and JRI. The JRI would normally be restricted to quantitative and functional checks only, except where check proof is required to be carried out. In case PDI/JRI are planned to be conducted by authorised Third Party Inspection (TPI) Agencies, the same will be spelt out in the QA instructions and the details included in the finalised ATP. QA of equipment will be carried out as per finalised QA plan in the contract. The successful Bidder would also be required to provide those test facilities at OEM premises/accredited laboratories for quality assurance, which are not available with QA agencies. Details of the same will be intimated to the Bidder during finalisation of ATP. Guidelines for framing Draft ATP by the Vendor are attached as **Appendix L**.

Marking and Packaging

40. **Marking of Deliverables**. The Bidder shall ensure that each deliverable is marked clearly and indelibly, as follows:-

(a) In accordance with the requirements specified in the RFP, with the indicated codification number or alternative reference number specified.

(b) Ensure that any marking method used does not have a detrimental effect on the strength, serviceability or corrosion resistance of the deliverables.

(c) Where the deliverables have a limited shelf life, with the cure date/date of manufacture or expiry date expressed as months and years.

41. Where it is not possible to mark a deliverable with the required particulars, these should be included on the package in which the deliverable is packed.

42. **Packaging of Deliverables**. The Bidder shall pack or have packed the deliverables, as applicable: -

(a) In accordance with DEFSTAN 81-041 (Part 1)/STANAG-4280 or equivalent Military Standard.

(b) To ensure that each deliverable may be transported in an undamaged and serviceable condition.

43. The Bidder shall ensure that each package containing the deliverable is labeled to include: -

(a) The name and address of the consigner and consignee including

(i) The delivery destination/address if not of the consignee

(ii) Transit destination/address (for aggregation/disaggregation, onward shipment etc)

(b) The description and quantity of the deliverables.

(c) The full part number in accordance with codification details.

(d) The makers part, catalogue, serial, batch number, as appropriate.

(e) The contract number.

(f) Any statutory hazard markings and any handling markings including the mass of any package which exceeds 3 kgs.

(g) The Packaging Label (military J, N or P, special H, commercial A, C etc) (specify reference to DEFSTAN 81-041 (Part 1)/STANAG-4280 or equivalent Military Standard.)

PART III - COMMERCIAL REQUIREMENTS

44. The third part of the RFP consists of the commercial clauses and Standard clauses of contract. The bidders are required to give confirmation of their acceptance of these clauses.

Commercial Bid

45. The Bidder is requested to take into consideration the ***Commercial Clauses and Payment Terms*** given at **Appendix G** to this RFP while formulating the Commercial Offers. The bidders are required to quote their price in Price bid format given in **Appendix H** to this RFP.

46. The Commercial Offer must be firm and fixed and should be valid for at least 06 months from the last date of bid submission.

Commercial Bid Opening

47. The Commercial Offers will be opened only of the vendors whose equipment is found Technically and demonstration compliant by the Empowered Committee or the representative nominated by the Empowered Committee if Bidder desires he may depute his representative, duly authorised in writing, to be present at the time of opening of the offers.

48. The date, time and venue fixed for this purpose will be intimated separately.

49. The Empowered committee will determine the lowest bidder (L1).

Additional Aspects

50. **Standard Conditions of RFP.** The Government of India desires that all actions regarding procurement of any equipment are totally transparent and carried out as per established procedures. The bidder is required to accept our standard conditions furnished at **Appendix J** to this RFP regarding Agents, penalty for use of undue influence and Integrity Pact, access to books of accounts, arbitration and clauses related to Law. These conditions along with other clauses of the Contract form the Standard Contract Document (as at **Chapter VI** of DAP 2020) indicates the general conditions of contract that would be the guideline for all acquisitions. The draft contract would be prepared as per these guidelines. In addition, **'Termination Clause'** as given in **Para 8** of **Appendix J** to this **RFP** will be applicable.

PART IV: BID EVALUATION AND ACCEPTANCE CRITERIA

51. A list of documents/details to be submitted along with the bids is placed at **Appendix M** as a reference to help in completeness of bid and meeting the procurement process schedule.

52. The bids shall be unconditional and unqualified. Any condition or qualification or any other stipulation contained in the bid shall render the bid liable to rejection as a non-responsive bid.

53. The bid and all communications in relation to or concerning the bidding documents shall be in English language.

54. **Evaluation and Acceptance Process**.

(a) **Evaluation of Technical Proposals**. The technical proposals forwarded by the Bidders will be evaluated by the Empowered Committee (EC) on all parameters of the RFP, including Operational Characteristics and Features as given in Appendix A to this RFP. The Empowered Committee will examine the extent of variations/differences, if any, in the technical characteristics of the equipment offered by various Bidders with reference to the Operational and Technical Requirements and prepare a ‘‘Compliance Statement” for shortlisting the Bidders. The compliance would be determined only on the basis of the parameters specified in the RFP by the Empowered Committee. The Evaluation will shortlist the equipment recommended for introduction into service.

(b) **Evaluation of Commercial Bid**. The Commercial bids of only those bidders will be opened, whose technical bids and demonstration have been found compliant by the Empowered Committee. . Comparison of bids would be done on the basis of Evaluation criteria given in **Appendix H** to this RFP. The L-1 bidder would be determined by Empowered Committee on the basis of **Appendix H** to this RFP. Only L-1 bidder would be invited for negotiations by Empowered Committee.

(c) **Contract Conclusion/Placement of Order**. The successful conclusion of Contract Negotiation will be followed by contract conclusion/placement of order.

Appendix A
(Refers to Para 25, 26, 27, 29, 30 & 37 of RFP)

OPERATIONAL CHARACTERISTICS AND FEATURES

1. Operational characteristics and features of Family of Software Defined Radio Sets are enclosed as per Annexures given below: -

(a)	Annexures I	-	Handheld SDR Sets.
(b)	Annexures II	-	Manpack SDR Sets.
(c)	Annexures III	-	Vehicle Based SDR Sets
(d)	Annexures IV	-	Clause for Interoperability with Armed AFV SDR Sets being procured under Current EP and interoperability with Legacy Sets (STARS V and CNR 900).
(e)	Annexure V	-	Certification for Receipt of Requisite Data for Ensuring Interoperability

Annexures I to Appendix A
(Refers to Para 1 (a) of Appendix A)

BROADBAND IP SOFTWARE DEFINED RADIO – HAND HELD OPERATIONAL REQUIREMENT

Ser No	Operative Requirements
1.	The V/UHF Hand Held (HH) SDR is envisaged to be used for the following applications in the Indian Army :- (a) Clear and Secure Combat Net Radio for voice and data communication. (b) Clear and Secure Mobile Adhoc Networks (MANET) and for networked voice, data and video communication.
2.	**Frequency Range** 30-512 MHz
3.	**Power Output.** The power output of the Hand-Held V/UHF SDR should be 4W or greater.
4.	**Communication Ranges**. The Hand-Held radio set should be able to provide a communication range of 3 Km or greater in line of sight in Narrow Band & Wideband waveforms in LoS mode.
5.	**Power Source.** The handheld form factor radio should be capable of working continuously for a minimum period of **10** hours at **1:1:8 or better** (TX: RX: Wait Ratio) with rechargeable and disposable batteries.
6.	**Battery Charging** battery charger with suitable connectors should be provided.
7.	**Waveforms**. The waveforms for the V/UHF SDR in all modes of operation (Clear - Fixed Frequency and Frequency Hopping Secure - Fixed Frequency and Frequency Hopping) are as under :– (a) **Voice**. Provides voice communication for ground to ground application. (b) **Narrow Band (NB) Data**. Provides voice and throughput data of 100 Kbps or more (with channel bandwidth of upto 250 KHz or less). (c) **Wide Band (NB) Data**. Provides voice and through put data of 1.0 Mbps or more (with channel bandwidth upto 2.5 MHz or less).
8.	The HH SDR should have the capability to load additional waveforms. The Handheld form factor should be capable of storing multiple waveforms as necessary. It should be possible to load and work with the desired waveform without switching off or rebooting the radio set.
9.	**Waveform Loading and Waveform Development Tool.** The HH SDR should be provided with a waveform loading mechanism and waveform development tool or fill gun or both. The waveform loading mechanism will enable loading of new waveforms into the SDR to be carried in the field.
10.	**Modes of Operation.** The SDR should be provided with the Squelch mode of operation.
11.	**Data Capabilities.** (a) The V/UHF HH SDR should support data transmission at following data rates:-

Ser No	Operative Requirements
	(i) **Narrow Band**. Provides voice and throughput data of 100 Kbps or more (with channel bandwidth atleast 25 KHz.) (ii) **Wide Band.** Provides voice and throughput data of 1.0 Mbps or more (with channel bandwidth atleast 2.5 MHz). (b) The equipment should be able to transmit voice, data and video simultaneously. It should be possible to transmit data in Net Radio Mode of operation (one to one or one to many or one to all) as well as in MANET mode (unicast, multicast and broadcast).
12.	**Mobile Adhoc Network (MANET)** :- (a) The SDR should be able to establish MANET. The requirement of number of modes is 16 or more in Narrow Band MANET and 32 or more Nodes in Wide Band MANET. (b) The MANET should support adaptive bandwidth allocation and master less dynamic architecture. The details of MANET working are enumerated below :- **Voice** (i) MANET parameters of Narrow Band Voice- 03 Hops (Min) with Minimum Range Point to point distance of at least 3 km and 9 km over 3 hops in clear line of sight conditions. (ii) MANET parameters of Wide Band Voice - 03 Hops (Min) with Minimum Range Point to point distance of at least 3 km and 6km over 3 hops in clear line of sight conditions.. **Data** (i) MANET parameters of Narrow Band Data 03 Hops (Min) with minimum Range Relay data to a distance of at least 7 km and atleast 9 km over 05 hops in clear line of sight conditions. (ii) MANET parameters of Wide Band of data 03 Hops (Min) with minimum Range Relay data to a distance of at least 7 km and atleast 10 km over 05 hops in clear line of sight conditions.
13.	**BER**. The SDR should have built in FEC to be able to Detect and correct channel BER.
14.	**ECCM (Anti Jamming and Anti Detection).** The SDR shall provide Frequency Hopping (FH) with a Hop rate of demo Hops or more per second in entire frequency band. The Radio set shall have the capability to have at least 10 preset user selectable and configurable frequency tables with at least 50 frequencies spot in a table.
15.	**Antenna.** The SDR should have suitable antennas which cover the entire V/UHF frequency range for the radio set.
16.	**Interfaces**. The equipment should have the interfaces for the following:– (a) Ethernet.

Ser No	Operative Requirements
	(b) Interfaces required for exploiting full functionality of the equipment.
17.	The SDR interfaces, accessories, cables, cords, switches and displays will have ruggedisation in accordance with minimum Mil Standard 810-F.
18.	**Booting and Switching Time.** <= 120 secs.
19.	It should be possible to load the waveforms without power - off and rebooting. The SDR should have at least 10 Pre-set channels operable by knob.
20.	On powering up. The SDR should offer selection of the last operated waveform, or any other waveform residing in the SDR.
21.	Applications should be provided to exploit the SDR data capability.
22.	**Data Terminal Equipment (DTE).** Ruggedized DTE will be supplied with the Handheld and should support the following :- (a) Be of such form factor that is wearable by soldier in his forearm. (b) Facilitate sending of voice, video, short messages and data. (c) Map based GUI giving geographical location of radio sets in the network. (d) GUI based management of radio network. (e) Applications should be provided for exploitation of the functions given above.
23.	The display unit should have a full HD display of (not greater than) 7" LED screen, touch screen operable with finger and stylus. The DTE should have Processor of at least 64 Bit, 2 Ghz or better, RAM - 4 GB or better, Memory - 64 GB or better. The weight of the DTE including battery should not exceed 1 Kg (excluding connectors). There should be suitable carrying case provided for the DTE. DTE should be Mil Std 810 F/ 810 G.
24.	The networking protocol suite should employ Internet Protocol (IP). IPV4 will be supported. Ancillaries and accessories as required to interface with the SDR should be provided.
25.	**Positioning, Navigation and Timing** (a) **GPS**. The SDR should have an inbuilt GNSS receiver catering to multiple GNSS services like GPS. (b) **Synchronization**. The SDR should support synchronization.
26.	**Software Communication Architecture (SCA).** The SDR system architecture should be in accordance with the **SCA version 2.2.2** or later**.**
27.	**Security.** The equipment should support the following:- Industrial grade secrecy be provided to the secure information being passed on the SDR. AES 256 and another equivalent algorithm to be provided for secrecy.
28.	**Key Management**. The cryptographic algorithms and keys shall be capable of being loaded into the security module via a key loading device.

<table>
<tr><th>Ser No</th><th>Operative Requirements</th></tr>
<tr><td>29.</td><td>Physical and Electrical Characteristics. The set should have following electrical characteristics : -

(a) Transmitter.

<table>
<tr><th>Ser No</th><th>Characteristic</th><th>Values</th></tr>
<tr><td>(i)</td><td>Frequency Accuracy</td><td>+ 1 ppm</td></tr>
<tr><td>(ii)</td><td>Harmonics</td><td>As per Mil Std 461 F</td></tr>
<tr><td>(iii)</td><td>Spurious Emission</td><td>As per Mil Std 461 F</td></tr>
<tr><td>(iv)</td><td>RF Head</td><td>One</td></tr>
<tr><td>(v)</td><td>Self-Protection</td><td>VSWR and Automatic power reduction in event of excess temperature</td></tr>
</table>

(b) Receiver.

<table>
<tr><th>Ser No</th><th>Characteristic</th><th>Values</th></tr>
<tr><td>(i)</td><td>Sensitivity</td><td>10 dB SINAD (min) for RF input level of 0.7 micro volt</td></tr>
</table>
</td></tr>
<tr><td>30.</td><td>Weight. Less than or equal to 1.5 Kg including Battery</td></tr>
<tr><td>31.</td><td>Physical Dimensions (HxWxD) in cm. Less than or equal to 15 x 10 x 6 without battery.</td></tr>
<tr><td>32.</td><td>Connectors. The SDR should provide interface connectors for connecting data terminal and other accessories and parts of the equipment.</td></tr>
<tr><td>33.</td><td>Controls. The HH SDR should have a front panel having control and selector knobs. Selective entry of key and other data should be possible with the help of suitable loading device. The display should have antiglare feature for daytime function and be such that it is visible at night also. The data and radio parameters should not be lost when changing battery and turning the radio off.
To facilitate the operation, the SDR should incorporate a display which displays status as necessary for efficient working including battery status, freq ch being used etc.</td></tr>
<tr><td>34.</td><td>EMI/EMC Specifications. The EMI/EMC standards as per Mil Std 461F or better should be complied with. There should be no interference when radio systems are co - located and being used concurrently.</td></tr>
<tr><td>35.</td><td>Field Operating Temperature. The equipment should be capable of functioning satisfactorily under all prevailing conditions The equipment should be able to withstand following - Field Operating Temperature’ conditions Between -20°C to +55°C</td></tr>
<tr><td>36.</td><td>Environmental Standards. All the environments tests including temperature shall be carried out in accordance with MIL STD 810 G.</td></tr>
<tr><td>37.</td><td>Emergency Erasure. Facility for emergency erasure should be inbuilt to erase all the keys and algorithm.</td></tr>
<tr><td>38.</td><td>Repair and Maintenance. Equipment should be modular in construction. Essential spare parts, SMT/STE/TJs, Training Aggregate. Technical Literature and ancillaries for carrying out repairs and maintenance of SDR should be provided.</td></tr>
<tr><td>39.</td><td>BITE. Built in Test (BITE) supporting diagnostics should be provided It should be</td></tr>
</table>

Ser No	**Operative Requirements**
	able to diagnose a fault down to card level.
40.	**Visual Alarm Features.** Visual alarm features should be provided for self – test failure.
41.	**Reliability**. The equipment shall be capable of continuous operations for atleast 72 Hrs on a single set basis
42.	**Diagnostic Facility.** The SDR should have the facility of carrying out diagnostics. Complete software of the SDR should be restorable in field conditions during maintenance with manual intervention.
43.	**Interoperability:-** HH SDR should be interoperable in all mode of operations with the Manpack & Vehicle Based SDR sets.
44.	**Shelf Life.** 10 Yrs.

Annexures II to Appendix A
(Refers to Para 1 (b) of Appendix A)

OPERATIONAL REQUIREMENT MANPACK SOFTWARE DEFINED RADIO (SDR)

Ser No	Operational Requirement	Remarks
1.	The V/UHF SDR is envisaged to be used for the following applications in the Indian Army :- (a) Clear and Secure Combat Net Radio for voice and data Communication. (b) Clear and Secure Mobile Adhoc Networks (MANET) and for networked voice, data and video communication.	
2.	**Frequency Range**. 30 – 512 MHz	
3.	**Power Output**. The power output of the Man Pack V/UHF should be 10W or grater with minimum two lower power output configurations.	
4.	**Communication Ranges**. The Man-Pack radio set should be able to provide a communication range of 10 km or greater in line of sight with road antenna.	
5.	**Power Source**. The Man-Pack form factor radio should be capable of working continuously for a minimum period of 8 hours at **1:1:8 or better** (TX: RX: Wait Ratio) with rechargeable and disposable batteries and for 12 hrs with 12V 75 AHC secondary batteries. The Man-Pack radio should also have the facility to work off 230±20% volt AC at 50Hz±10% using provided adaptor (adaptor forms part of the equipment).	
6.	**Battery Charging**. Suitable charger should be provided to charge the batteries from AC Mains. It should be able to charge at least two batteries at the same time.	
7.	**Waveforms**. The waveforms for the V/UHF SDR in all modes of operation (Clear - Fixed Frequency and Frequency Hopping Secure - Fixed Frequency and Frequency Hopping) are as under :– (a) **Voice**. Provides voice communication for ground to ground application. (b) **Ground to Air Voice**. Provide voice communication for ground to air application. (c) **Narrow Band (NB) Data**. Provides voice and throughput data of 100 Kbps or more (with channel bandwidth of upto 250 KHz or less). (d) **Wide Band (WB) Data**. Provides voice and throughput data of 1.0 Mbps or more (with channel bandwidth upto 2.5 MHz or less).	
8.	The SDR should have the capability to load additional waveforms. The Man-Pack form factor should be capable of storing multiple waveforms as necessary. It should be possible to load and work with the desired waveform without switching off or rebooting the radio set.	
9.	**Waveform Loading and Waveform Development Tool**. The SDR should be provided with a waveform loading and waveform development tool or fill gun or both. The waveform loading tool will enable loading of new waveforms into the SDR to be carried out in the field.	

10.	**Modes of Operation**. The SDR should be provided with Squelch mode of operation.	
11.	**Data Capabilities.** (a) The V/UHF SDR should support data transmission at following data rates:– (i) **Narrow Band**. 100 Kbps throughput or more (with channel bandwidth atleast 25KHz) (ii) **Wide Band**. 1.0 Mbps throughput or more (with channel bandwidth atleast 2. 5 MHz) (b) The equipment should be able to transmit voice, data and video. It should be possible to transmit data in Net Radio Mode of operation as well as in MANET mode.	
12.	**Mobile Adhoc Network (MANET).** (a) The SDR should be able to establish MANET. The requirement of number of modes is 16 or more is Narrow Band MANET and 32 or more Nodes in Wide Band MANET. (b) The MANET should support adaptive bandwidth allocation and master less dynamic architecture. The details of MANET working are enumerated below :- **Voice** (i) MANET parameters of Narrow Band Voice 03 Hops (Min) with Minimum Range Point to point distance of at least 10 km and 30 km over 3 hops in clear line of sight conditions. (ii) MANET parameters of Wide Band Voice 03 Hops (Min) with Minimum Range of point to point distance of at least 10 km and 30 km over 3 hops in clear line of sight conditions. **Data** (i) MANET parameters of Narrow Band Data 05 Hops (Min) with minimum Range Relay data to a distance of at least 50km over 05 hops in clear line of sight conditions. (ii) MANET parameters of Wide Band of data 05 Hops (Min) with Minimum Range of Relay data to a distance of at least 35km over 05 hops in clear line of sight conditions.	
13.	**BER**. The SDR should have built in FEC to be able to detect and correct channel BER.	
14.	**ECCM (Anti Jamming and Anti Detection).** The SDR shall provide Frequency Hopping (FH) with a Hop rate of 250 Hops or more per second in entire frequency band. The Radio set shall have the capability to have at least 10 preset user selectable and configurable frequency tables with at least 50 frequencies spot in a table.	

15.	**Antenna**. The SDR should have broadband antennas which cover the entire V/UHF frequency range for the radio set. All aerials / antennas for the Man-Pack radios should be of variable height and have a flexible mount. Man-Pack radio set should be provided with Tape/Whip antenna of 3.1m or less and rod or long whip antenna of length not more than 5m. The following types of antennas should be provided: - (a) Antennas which are suitably integrated in Man-Pack version. (b) GNSS antenna.	
16.	**Interfaces**. The equipment should have the interfaces for the following:– (a) Ethernet. (b) Interfaces required for exploiting full functionality of the equipment.	
17.	The SDR, interfaces, accessories, cables, cords, switches and displays will have ruggedization in accordance with latest version of Mil Std 810 F as applicable.	
18.	**Accessories** **Handset**. The SDR should have a handset.	
19.	**Loud Speaker**. A loud speaker for field combat use with a facility to attach to the belt or harness should be provided.	
20.	**Carrying Harness**. The weight of the carrying harness should be less than 2.5kgs. Harness must be made of strong material and the frame must be comfortable to wear during long marches.	
21.	Any other accessories that facilitate in the efficient functioning of the SDR to be provided, conforming to Mil Std 810 F as applicable.	
22.	**Booting and Switching Time.** <= 120 secs.	
23.	It should be possible to load the waveforms without power–off and rebooting. The SDR should have at least 10 preset channels.	
24.	Applications should be provided to exploit the SDR data capability. The SDR should provide for user defined and free message formats.	
25.	**Data Terminal Equipment (DTE)**. Ruggedized DTE will be supplied with the Man-Pack and should support the following:– (a) Facilitate sending of voice, video, short messages and data. (b) GUI based management of radio network. (c) Applications should be provided for exploitation of the functions given above. (d) Map based GUI giving geographical location of radio sets in the network.	
26.	The display unit of DTE should have a full HD display of (at least) 7” LED screen which is anti–glare, sunlight readable, touch screen operable with finger and stylus. The DTE should have Processor of at least 64 Bit, 2 Ghz or	

<table>
<tr><td></td><td>better, RAM – 8 GB or better, Memory – 64 GB or better. The weight of the DTE including battery should not exceed 1 kg. There should be suitable carrying case provided for the DTE. DTE should be MIL STD 810F/ 810 G compliant.</td><td></td></tr>
<tr><td>27.</td><td>The networking protocol suite should employ Internet Protocol (IP). IPV4 will be supported. Ancillaries and accessories as required to interface with the SDR should be provided.</td><td></td></tr>
<tr><td>28.</td><td><u>Positioning, Navigation and Timing</u>

(a) <u>GPS</u>. The SDR should have an inbuilt GNSS receiver catering to multiple GNSS services like GPS.

(b) <u>Synchronization</u>. The SDR should support synchronization.</td><td></td></tr>
<tr><td>29.</td><td><u>Navigation</u>. The SDR should support integrating Map based navigation system, in the form of a suitable application within the supplied data terminal equipment (DTE).</td><td></td></tr>
<tr><td>30.</td><td><u>Software Communication Architecture (SCA).</u> The SDR system architecture should be in accordance with the SCA version 2.2.2 or later.</td><td></td></tr>
<tr><td>31.</td><td><u>Security</u>. The equipment should support the following:-
Industrial grade secrecy be provided to the secure information being passed on the SDR. AES 256 and another equivalent algorithm to be provided for secrecy.</td><td></td></tr>
<tr><td>32.</td><td><u>Key Management</u>. The cryptographic algorithms and keys shall be capable of being loaded into the security module via Key loading device.</td><td></td></tr>
<tr><td>33.</td><td><u>Key Handling and Storage</u>. The SDR shall support key loading using key loading device The SDR shall be capable of secure storage of key material for duration as specified by user.</td><td></td></tr>
<tr><td>34.</td><td><u>User Authentication</u>. The SDR should be password protected for normal usage.</td><td></td></tr>
<tr><td>35.</td><td><u>Physical and Electrical Characteristics</u>. The set should have following electrical characteristics:-

(a) <u>Transmitter</u>.

<table>
<tr><th><u>Ser</u></th><th><u>Characteristic</u></th><th><u>Values</u></th></tr>
<tr><td>(i)</td><td>Frequency Accuracy</td><td><u>+</u> 1 ppm</td></tr>
<tr><td>(ii)</td><td>Harmonics</td><td>As per MIL STD 461E</td></tr>
<tr><td>(iii)</td><td>Spurious Emission</td><td>As per MIL STD 461E</td></tr>
</table>

(b) <u>Receiver</u>.

<table>
<tr><th><u>Ser</u></th><th><u>Characteristic</u></th><th><u>Values</u></th></tr>
<tr><td>(i)</td><td>Sensitivity</td><td>10 dB SINAD (min) for RF input level of 0.7 micro volt</td></tr>
</table>
</td><td></td></tr>
<tr><td>36.</td><td><u>Weight.</u> Less than 5 kg including battery (less other accessories).</td><td></td></tr>
<tr><td>37.</td><td><u>Physical Dimensions (HxWxD) in mm</u>. 370 x260x110 including battery.</td><td></td></tr>
<tr><td>38.</td><td><u>Connectors</u>. The SDR should have a front panel having control and selector knobs, display and keypad for SDR functioning and programming of parameters. Selective entry of key and other data should be possible with the help of keypad or fill–gun. The display should have antiglare feature for daytime function and be such that it is visible at night also. The data and radio parameters should not be lost when changing battery and turning the radio off.</td><td></td></tr>
</table>

	To facilitate the operation, the SDR should incorporate a display which displays status as necessary for efficient working including battery status, freq ch being used etc.	
39.	**Controls**. The SDR should have a front panel having control and selector knobs for SDR functioning and programming of parameters.	
40.	**EMI/EMC Specifications**. The EMI/EMC standards as per MIL STD 461E or better and ESD test (MIL STD 464) should be complied with. There should be no interference when radio systems are co-located and being used concurrently.	
41.	**Field Operating Temperature**. The equipment should be capable of functioning satisfactorily under all prevailing conditions. The equipment should be able to with stand following 'Field Operating Temperature' conditions:- (a) Minimum Temperature: Between minus 20^0C to minus 10^0C. (b) Maximum Temperature : Between 40^0 C to 45^0 C.	
42.	**Environmental Standards**. All the environments tests including temperature shall be carried out in accordance with MIL STD 810 F.	
43.	**Reliability, Maintenance and Miscellaneous Safety**. The equipment should have safeguards against the following:– (a) Reverse polarity. (b) Power and line surge spikes. (c) Short /open circuit antenna connection. (d) An adaptor which can be fitted in SDR to protect against lighting protection. (e) Over voltage/under voltage protection.	
44.	**Emergency Erasure**. Facility for emergency erasure should be inbuilt to erase all the keys and algorithm.	
45.	**Repair and Maintenance**. Equipment should be modular in construction. Essential spare parts, SMT/STE/TJs, Training Aggregate. Technical Literature and ancillaries for carrying out repairs and maintenance of SDR should be provided.	
46.	**BITE**. Built in Test (BITE) supporting diagnostics provided should be able to diagnose fault down to card level.	
47.	**POST**. The SDR should perform Power On Self-Test (POST) functions to determine the health status of the equipment.	
48.	**Visual Features**. Visual features should be provided for self-test failure.	
49.	**Reliability**. The equipment shall be capable of continuous operations for atleast 72 Hrs on a single set basis.	
50.	**Diagnostic Facility**. The SDR should have the facility of carrying our diagnostics. It should be possible to initiate the diagnostics feature after an authentication password. Complete software of the SDR should be restorable in field conditions during maintenance with manual intervention	
51.	**Interoperability:-** Manpack SDR sets should be interoperable in all mode of operations with the Hand Held & Veh Based SDR sets.	
52.	**Shelf Life.** 10 Yrs.	

Annexures III to Appendix A
(Refers to Para 1 (c) of Appendix A)

OR FOR 'B' VEHICLE BASED SOFTWARE DEFINED RADIO SETS

S No	Operating Requirements	Remarks
1.	**Frequency Range**. 30 – 512 MHz	
2.	**Power Output**. The power output of the SDR should be more than 50W with minimum two lower power output configurations.	
3.	**RF Head.** SDR should provide one RF head.	
4.	**Communication Ranges**. The radio should be able to provide a communication range of atleast 15 Km or greater in line of sight with rod Antenna.	
5.	**Power Source**. Nominal 24 V (or higher)	
6.	**Waveforms**. The waveforms for the V/UHF SDR in all modes of operation (Clear – Fixed Frequency and Frequency Hopping; Secure - Fixed Frequency and Frequency Hopping) should support the following:– (a) **Voice**. Provides voice communication for ground to ground application in AM and FM. (b) **Narrow Band (NB) Data**. Provides voice and throughput data of 100 Kbps or more (with channel bandwidth of atleast 25 KHz). (c) **Wide Band (WB) Data**. Provides voice and throughput data of 1.0 Mbps or more (with channel bandwidth atleast 2.5 MHz).	
7.	The SDR should have the capability to load additional waveforms. The 'B' Vehicle form factor should be capable of storing multiple waveforms as necessary. It should be possible to load and work with the desired waveform without switching off or rebooting the radio set.	
8.	**Waveform Loading and Waveform Development Tool**. The SDR should be provided with a waveform loading tool or fill gun or both. The waveform loading tool will enable loading of new waveforms into the SDR to be carried out in the field.	
9.	**Modes of Operation**. The SDR should be provided with the Squelch mode of operation.	
10.	**Data Capabilities.** (a) The SDR should support data transmission at following data rates:- (i) **Narrow Band**. 100 Kbps throughput or more. (ii) **Wide Band**. 1.0 Mbps throughput or more. (b) The equipment should be able to transmit voice, data and video. It should be possible to transmit data in Net Radio Mode of operation as well as in MANET mode.	
11.	**Mobile Adhoc Network (MANET)** The SDR should be able to establish MANET with 16 or more radios in NB and	

	32 or more in WB. The MANET should support adaptive bandwidth allocation and master-less dynamic architecture. **Voice** (i) MANET parameter of Narrow Band Voice 03 Hops (Min) with Minimum Range Point to point distance of at least 10 km and 30 km over 3 hops in clear line of sight conditions. (ii) MANET parameter of Wide Band Voice 03 Hops (Min) with Minimum Range of Point to point distance of at least 10 km and 30 km over 3 hops in clear line of sight conditions. **Data** (i) MANET parameters of Narrow Band Data 04 Hops (Min) with minimum Range Relay data to a distance of at least 40 km over 04 hops in clear line of sight conditions. (ii) MANET parameters of Wide Band of data 05 Hops (Min) with Minimum Range of Relay data to a distance of at least 50km over 05 hops in clear line of sight conditions.	
12.	**BER**. The SDR should have built in FEC to be able to detect and correct channel BER.	
13.	**ECCM (Anti Jamming and Anti Detection).** The SDR shall provide Frequency Hopping (FH) with a Hop rate of 250 Hops or more per second in entire frequency band. The Radio set shall have the capability to have at least 10 preset user selectable and configurable frequency tables with at least 50 frequencies spot in a table.	
14.	**Antenna**. The SDR should have broadband antennas which cover the entire V/UHF frequency range for the radio set. All aerials / antennas for the radios should be of variable height and have a flexible mount. The following types of antennas should be provided:– (a) Radio Set should be provided with Rod or long whip antenna. (b) Antennas including GNSS antenna which are suitably integrated in 'B' Vehicle.	
15.	**Interfaces**. The equipment should have the interfaces for the following:– (a) Ethernet. (b) Interfaces required for exploiting full functionality of the equipment.	
16.	The SDR, interfaces, accessories, cables, cords, switches and displays will have ruggedisation in accordance with Mil Std 810 F as applicable.	
17.	**Handset**. The SDR should have a handset.	
18.	Any other accessories that facilitate in the efficient functioning of the SDR to be provided, conforming to Mil Std 810 F as applicable.	
19.	**Booting and Switching Time.** <= 120 secs.	
20.	It should be possible to load the waveforms without power–off and rebooting.	

21.	On powering up, the SDR should offer selection of the last operated waveform, or any other waveform residing in the SDR.	
22.	Applications should be provided to exploit the SDR data capability. The SDR should provide for user defined and free message formats.	
23.	**Data Terminal Equipment (DTE)**. Ruggedized DTE will be supplied with the Man-Pack and should support the following:– (a) Facilitate sending of voice, video, short messages and data. (b) GUI based management of radio network. (c) Applications should be provided for exploitation of the functions given above. (d) Map based GUI giving geographical location of radio sets in the network.	
24.	The display unit should have a full HD display of (at least) 7" LED screen which is anti–glare, sunlight readable, touch screen operable with finger and stylus. The DTE should have Processor of at least 64 Bit, 2 Ghz or better, RAM – 8 GB or better, Memory – 64 GB or better. The weight of the DTE including battery should not exceed 1 kg. There should be suitable carrying case provided for the DTE. DTE should be Mil Std 810 F / 810G compliant.	
25.	The networking protocol suite should employ Internet Protocol (IP). IPV4 will be supported. Ancillaries and accessories as required to interface with the SDR should be provided.	
26.	**Positioning, Navigation and Timing.** (a) **GPS**. The SDR should have an inbuilt GNSS receiver catering to multiple GNSS services like GPS. (b) **Synchronization**. The SDR should support synchronization.	
27.	**Navigation**. The SDR should support integrating Map based navigation system, in the form of a suitable application within the supplied data terminal equipment (DTE).	
28.	**Software Communication Architecture (SCA).** The SDR system architecture should be in accordance with the SCA version 2.2.2 or later.	
29.	**Security.** The equipment should support the following:- Industrial grade secrecy be provided to the secure information being passed on the SDR. AES 256 and another equivalent algorithm to be provided for secrecy.	
30.	**Algo Handling and Storage**. Algo should be user selectable. Provision for additional algo loading should be provided. Emergency erasure facility should be provided.	

<table>
<tr><td>31.</td><td><u>Physical and Electrical Characteristics</u>. The set should have following electrical characteristics:-

(a) <u>Transmitter</u>.

<table>
<tr><th><u>Ser No</u></th><th><u>Characterstic</u></th><th><u>Values</u></th></tr>
<tr><td>(i)</td><td>Frequency Accuracy</td><td><u>+</u> 1 ppm</td></tr>
<tr><td><u>(ii)</u></td><td>Harmonics</td><td>As per Mil Std 461E</td></tr>
<tr><td><u>(iii)</u></td><td>Spurious Emission</td><td>As per Mil Std 461E</td></tr>
</table>

(b) <u>Receiver</u>.

<table>
<tr><th><u>Ser No</u></th><th><u>Characterstic</u></th><th><u>Values</u></th></tr>
<tr><td>(i)</td><td>Sensitivity</td><td>10 dB SINAD (min) for RF input level of 0.7 micro volt</td></tr>
</table>
</td><td></td></tr>
<tr><td>32.</td><td><u>Weight.</u> Less than 30 kg including battery (less other accessories).</td><td></td></tr>
<tr><td>33.</td><td><u>Physical Dimensions (HxWxD) Radio Sets (RS)</u>. Less than or equal to the following dimensions:-

(a) Width - 350 mm.

(b) Height - 250 mm.

(c) Depth – 400 mm.</td><td></td></tr>
<tr><td>34.</td><td><u>Connectors</u>. The SDR should provide interface connectors for connecting data terminal and other accessories and parts of the equipment.</td><td></td></tr>
<tr><td>35.</td><td><u>Controls</u>. The SDR should have a front panel having control and selector knobs, display and keypad for SDR functioning and programming of parameters. Selective entry of key and other data should be possible with the help of keypad or fill–gun. The display should have antiglare feature for daytime function and be such that it is visible at night also. The data and radio parameters should not be lost when changing battery and turning the radio off.

To facilitate the operation, the SDR should incorporate a display which displays status as necessary for efficient working including battery status, freq ch being used etc.</td><td></td></tr>
<tr><td>36.</td><td><u>EMI/EMC Specifications</u>. The EMI/EMC standards as per Mil Std 461E or better and ESD test (Mil Std 464) should be complied with. There should be no interference when radio systems are co-located and being used concurrently.</td><td></td></tr>
<tr><td>37.</td><td><u>Field Operating Temperature</u>. The equipment should be capable of functioning satisfactorily under all prevailing conditions. The equipment should be able to withstand following ‘Field Operating Temperature’ conditions:-

(a) <u>Minimum Temperature</u>: Between minus 20^0C to minus 10^0C.

(b) <u>Maximum Temperature</u>: Between 40^0 C to 45^0 C.</td><td></td></tr>
<tr><td>38.</td><td><u>Environmental Standards</u>. All the environment tests including temperature shall be carried out in accordance with the latest version of Mil Std 810 - F as applicable.</td><td></td></tr>
</table>

39.	**Reliability, Maintenance and Miscellaneous Safety**. The equipment should have safeguards against the following:– (a) Reverse polarity. (b) Power and line surge spikes. (c) Short /open circuit antenna connection. (d) Over voltage / under voltage protection.	
40.	**Emergency Erasure**. Facility for emergency erasure should be inbuilt to erase all the keys and algorithms.	
41.	**Repair and Maintenance**. Warranty for two years and maintenance subsequently through ESP. 'O' and 'I' level repairs by EME and beyond 'I' level repairs by OEM..	
42.	**BITE**. Built in Test (BITE) supporting diagnostics should be provided. It should be able to diagnose a fault down to card level.	
43.	**POST**. The SDR should perform Power On Self-Test (POST) functions to determine the health status of the equipment.	
44.	**Visual Features**. Visual should be provided for self-test failure.	
45.	**Interoperability**. Veh based SDR should be interoperable in all mode of operations with the Manpack & Hand Held SDR sets.	
46.	**Shelf Life.** 10 Yrs.	

Annexures IV to Appendix A
(Refers to Para 1 (d) of Appendix A)

CLAUSE FOR INTEROPERABILITY FOR INFANTRY SDRs

Interoperability and Compatibility

1. Directorate General of Armoured Corps is also in the process of procuring Software Defined Radios (SDRs) for their Armoured Fighting Vehicles (AFVs) under the current Emergency Procurement and it is **preferable that the SDRs procured by Directorate General of Infantry and Directorate General of Armoured Corps are interoperable in SECURE VOICE (using AES 256 bit encryption) communication**.

2. In the event that the same vendor/OEM contracts both the SDR procurement cases, interoperability in SECURE voice communication between all the form factors i.e Hand-Held, Manpack, Truck/Ground and the AFV SDRs shall be demonstrated at the PDI stage by the SELLER.

3. In case the contract of the two procurement cases are awarded to two different vendors/OEM, then in order to achieve interoperability in SECURE voice communication the following actions shall be undertaken:-

(a) The SELLER of the Infantry SDRs is required to share necessary source code data of the voice waveform, waveform porting details, encryption software and algorithm including design and necessary documentation required for porting of the voice waveform in an Software Defined Radio which is SCA 2.2.2 (or better) compliant **within thirty days** of the signing of the contract with the User.

(b) Prior to the delivery of the first lot of Infantry SDRs (all form factors), the SELLER will be **required to make and port an interoperable voice waveform for SECURE mode** for the SDRs being procured by the Directorate General of Armoured Corps in the present Emergency Procurement. The SELLER will be facilitated with necessary data, as mentioned at Para 3(b) above, for the development of the interoperable secure voice waveform of the SDRs being procured by the Armoured Corps. This interoperable waveform will be **developed within six months** of receiving the said data and this aspect of interoperability in SECURE voice would be checked at the PDI stage.

4. However, incase proc case of AFV SDR Sets does not fructify, the clause of interoperability with SDRs being procured by Directorate General of Armoured Corps shall not apply.

5. **Interoperability with STARS V & CNR 900 Sets**. It is preferable that Infantry SDR Sets are 'Interoperable in Clear Voice' with STARS V Sets of Infantry & CNR 900 Sets of Armd Dte. This interoperability will be checked at the time of First 'PDI'.

Annexure V to Appendix A
(Refers to Para 3 (b) of Annexure IV to Appendix A)

CERTIFICATION FOR RECEIPT OF REQUISITE DATA FOR ENSURING INTEROPERABILITY

This is certified that the seller of Inf SDR Sets, M/s _____ has received all the requisite data from the seller of AFV SDR Sets, M/s _____ required for 'Making and porting an interoperable voice wave form in secure mode for the AFV SDR Sets' of M/s _____.

M/s _____
(Seller Inf SDR Sets)
Rep Inf Dte

M/s _____
(Seller AFV SDR Sets)
Rep Armd Dte

Appendix B
(Refers to Para 25, 29(b) & 30 of RFP)

COMPLIANCE TABLE

For Procurement of Family of Software Defined Radio Sets comprising Hand Held Radio Sets, Manpack Radio Sets and Vehicle Based Radio Sets

Ser No	Requirement as per the RFP	Compliance/ Partial Compliance	Indicate references of Paras/Sub Paras of the Main Technical Document
General Conditions of RFP (Para 1 to 54)			
Technical Parameters as per Appendix A			
	Essential Parameters 'A'		
Commercial Parameters as per RFP			
	Performance-cum-Warranty Bank Guarantee as per Para 2 of Appendix G of RFP		
	Advance Payment Bank Guarantee as per Para 1.3.3 of Appendix G of RFP		
	EMD of Rs Seventy (70) Lakhs as per Para 19 of RFP		

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Appendix C
(Refers to Para 11 of RFP)

WARRANTY CLAUSE

1. The **SELLER** warrants that the goods/services supplied under this contract conform to technical specifications prescribed and shall perform according to the said Technical Specifications.

2. The **SELLER** warrants for a period of 24 months from the date of acceptance deliverables post Joint Receipt Inspection that the goods/stores/services supplied under this contract and each component used in the manufacture thereof should be free from all types of defects/failures.

3. If within the period of warranty, the goods/stores are reported by the **BUYER** to have failed to perform as per the specifications, the **SELLER** shall either replace or rectify the same free of charge, maximum within 30 days of notification of such defect by the **BUYER** provided that the goods are used and maintained by the **BUYER** as per instructions contained in the Operating Manual. No spares will be drawn during the warranty period from the MRLS. **Warranty repair will be carried out in-situ. However, in case certain locations are inaccessible for the seller, then the buyer will relocate the stores to nearest Repair points from where the seller will collect the stores for warranty Repairs. Decision of Buyer with respect to accessibility of location where defective item is held will be final & binding on seller.** Warranty of the equipment would be extended by duration of downtime if not repaired within 30 days. Record of the down time would be maintained by user in log book. Spares **and all consumables** required for warranty repairs shall be provided free of cost by **SELLER**. The **SELLER** also warrants that the special oils and lubricants required for the warranty repair of the equipment shall be provided by the **SELLER** himself. **All activities including diagnosis, rectification, calibration, transportation etc, required for making equipment serviceable and available would be the SELLER's responsibility.** The **SELLER** also undertakes to diagnose, test, adjust, calibrate and repair/replace the goods/equipment arising due to accidents by neglect or misuse by the operator or damage due to transportation of the goods during the warranty period, at the cost mutually agreed to between the **BUYER** and the **SELLER**. The **SELLER** shall intimate the assignable cause of the failures.

4. **Cost towards all scheduled servicing during the warranty period will be borne by the SELLER to include spares.**

5. If a particular equipment/goods fails frequently and/or, the cumulative down time exceeds 10% of the warranty period **or a common defect is noticed in more than 05 % of the quantity of goods with respect to a particular item/component/sub-component, that** complete **item**/ equipment shall be replaced free of cost by the **SELLER** within a stipulated period of 30 days of receipt of the notification from the **BUYER** duly modified/upgraded through design improvement in all equipment supplied/yet to be supplied and ESP supplied/yet to be supplied.

6. **SELLER shall associate technical personnel of maintenance agency and QA of BUYER during warranty repair and shall provide complete details of defect, reasons and remedial actions for averting recurrence of such defects.**

7. In case the complete delivery of the Engineering Support Package is delayed beyond the period stipulated in this contract, then the **SELLER** undertakes that the warranty period for the goods/stores shall be extended to that extent.

8. **The SELLER warrants that the goods supplied will conform to the Temperature and Humidity conditions as mentioned at Appendix A to RFP.**

Note: Vendor to provide Warranty Card alongwith each equipment giving out Terms and Conditions of Warranty.

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Appendix D
(Refers to Para 31 of RFP)

CERTIFICATE: MALICIOUS CODE

(To be rendered on the Company Letter head)

1. This is to certify that the Hardware and the Software being offered, as part of the Contract, does not contain embedded malicious code that would activate procedures to:-

(a) Inhibit the desired and designed function of the equipment.

(b) Cause physical damage to the user or equipment during the exploitation.

(c) Tap information resident or transient in the equipment / networks.

2. The firm will be considered to be in breach of the procurement contract, in case physical damage, loss of information or infringements related to copyright and Intellectual Property Rights (IPRs) are caused due to activation of any such malicious code in embedded software.

(Signed)

Designation / Name / Address of firm

Date:

Place:

Appendix E
(Refers to Para 33 & 34 of RFP)

PRODUCT SUPPORT

1. **Maintenance Philosophy**. Maintenance of the equipment is structured under three different levels. The Maintenance philosophy for Family of SDR can be categorised into 'O' & 'I' levels depending upon the technological complexity of the equipment as under:-

(a) '**O' Level/Field Repairs**. These are **r**epairs carried out at field level by technician specially trained for this purpose and where the required special tools and spares have to be provided. These repairs comprise replacement of common Line Replaceable Units (LRUs), sub-modules, other components which may require Special Maintenance Tools (SMTs) supported by diagnostics using Special Test Equipment's (STEs). The vendor may also include Built in Test Equipment (BITE) facility to identify faulty up to field level. The manufacturer is required to provide the following:-

(i) Quantity and specification of spares up to sub-Module level, other replaceable components that need to be stocked for a specified population and class of the equipment.

(ii) Additional Special Maintenance Tools and Test Equipment needed for each such field work shop.

(b) **'I' Level Repairs**. Includes 3rd level Intermediate Repairs by Corps Zone workshop. These are extensive or special repairs carried out to include **Component Level Repairs. This level of repair envisages special diagnosis and repairs of the repairable inventory up to Printed Circuit Board (PCB) level, major assemblies, interface equipment/software and other components beyond the scope of field level repairs**. These repairs are carried out in the designated workshops by technicians specially trained for this purpose requiring special tools and spares and the number of such facilities will be stated based on equipment deployment pattern. The manufacturer is required, among others, to provide the following:-

(i) Quantity and specification of **components/spares up to PCB level** that need to be stocked for a population of the equipment.

(ii) Special Maintenance Tools and Test Equipment that has to be provided to each of these workshops.

(iii) Oils and lubricants necessary for Servicing.

(iv) All necessary technical literature.

(v) Calibration facilities for test equipment, where applicable.

(c) **Repairs beyond Intermediate level repairs will be undertaken by the OEM.** Separate contract will be signed for the same.

Engineering Support Package (ESP)

2. ESP is the basic engineering support the Seller needs to provide to the Buyer for undertaking essential repairs and maintenance of the equipment during its exploitation. These repairs and maintenance would be in consonance with the Maintenance Philosophy enunciated above. ESP would constitute the following aspects:-

(a) Spares.

(b) SMTs/STEs test set-up.

(c) Technical Literature.

(d) Training and training aggregates.

3. **Spares.**

(a) **Manufacturer's Recommended List of Spares (MRLS)**. This is the list of spares, recommended by the manufacturer, for maintaining operational serviceability of the equipment and sustains it for the period as stipulated in the RFP. Based on the explanation given above, the Bidder is to provide **MRLS to sustain the equipment for a period of 02 years for various level of repair as per format given at Annexure I to Appendix 'E'**. Cost of the MRLS, along with likely consumption rate of spares is to be provided with the technical proposal. MRLS would be provided separately for each such sub system including those for STEs. For STEs also, the spares would be categorized as field replaceable**.** ***In order to prevent manipulation of the quantum of MRLS for commercial competitiveness or overload unnecessary MRLS, 'Adequacy' Clause and 'Buy Back' clause are being co-opted in the contract*** as under:-

(i) **'Adequacy' Clause**. The Bidder will confirm to the Buyer that the range and depth of Accompanied Accessories/ User Replaceable Parts/ Expendable, Spares and SMTs/STEs being supplied are complete and adequate for carrying out repairs on the equipment **up to the component level**. Any Bidder found to be providing lesser ESP/MRLS in terms of range and depth will have to make good the deficiency at **No Extra Cost**. The Bidder will also commit that any additional items, spares, tools and equipment needed for use, maintenance and repairs will be supplied by the vendor at prices and within a period as specified in the contract, on receipt of notification from the Buyer for the Life-Cycle Support period. The Bidder will confirm that, if two different prices have been given for the same/similar item, then the lower price quoted will prevail. In case, the quoted accessories has several items viz, Sampling Accessory Kit and add up price of these items is higher than the quoted price of the accessory, then the price would be lowered / adjusted proportionately for the items.

(ii) '**Buy Back' Clause**. The Buyer shall have the option to amend the Manufacturer's Recommended List of Spares (MRLS) proposed by the Bidder within a period of the **two years** post expiry of the warranty period. The Bidder needs to agree to either 'Buy Back' the spares rendered surplus or exchange them on 'cost-to-cost' basis with the spares, as required by the Buyer. The said spares would be purchased / replaced by the Bidder, based on the prices negotiated in the contract.

(b) The spares are required to be categorized in four categories as follows:-

(i) Manufactured by Bidder as OEM and can be sourced as per Part No.

(ii) Bought out items and customized by the OEM for the specific purpose and such customization would require OEM intervention.

(iii) Bought out from other OEMs/Third Party as specialised items and used without any customization. Such items can be sourced by quoting their Part No./Identification No. as given by OEM/Third Party and directly utilised.

(iv) General Engineering items / COTs which can be sourced by stating the relevant standards and item description.

4. **Special Maintenance Tools / Special Test Equipment and Test Jigs (SMTs/STEs/Test Jigs).** SMTs and STEs are essential tools required to undertake effective engineering support / repairs on the equipment and its systems. Based on the Maintenance Philosophy Bidder is required to provide SMTs and STEs for repair **upto 'I' level repairs**. This would be formulated in a similar manner as explained as per the suggested format at **Annexure II to Appendix 'E'**. **SMTs and STEs Jigs will be provided and installed by the Bidder at designated repair points**. The list of equipment required to be supplied will incorporate Adequacy Clause, as elaborated above SMTs/STEs would also be subjected to demonstration on maintenance aspects.

5. **Technical Documentation.** The Bidder will be required to provide the technical literature. The details of technical literature to be supplied with the system should be listed as per the suggested format at **Annexure III to Appendix 'E'.** This should be provided with both Technical and Commercial Proposals. The cost column may be left blank in the Technical Proposal. An illustrated list of documents which may be submitted by the Seller is as under:-

(a) User Handbook/ Operators Manual in English.

(b) **Technical Manuals**. (As per governing JSG/Guide for other technologies)

(i) **Part I**. Tech description and functioning of various systems.

(ii) **Part II**. Inspection/ Maintenance tasks repair procedures, materials used, fault diagnosis and use of Special Maintenance Tools (SMTs)/Special Test Equipment (STEs).

(iii) **Part III**. Procedure for assembly/disassembly, repair up to field level, safety precautions.

(iv) **Part IV**. List of SMTs/ STEs Test Bench.

(v) Rotable list, norms of consumption, mandatory/ non-mandatory spares list for each system.

(c) Table of Tools & Equipment (TOTE) & carried spares.

(d) Complete Equipment Schedule.

(e) Repair and Servicing schedule.

(f) Design Specifications.

(g) Technical Manual on STEs with drawing references.

(h) IETM of Class III & above.

(j) Condemnation limits.

(k) Packing specifications /instructions.

(l) Any additional information suggested by the OEM.

6. **Training.** A training package for maintenance personnel to undertake operation and maintenance of equipment at 'O'& 'I' level along with tools and test equipment training would be required to be carried out in English and Hindi language. Requirements such as training aids, projection system, complete equipment with accessories, technical literature, spares, test equipment, test set up, charts, training handouts, power point presentations, Computer Based Training (CBT), Documentation etc will be provided by the Bidder for the conduct of training. Training should preferably be conducted six months prior to expiry of warranty period. The Bidder will provide the Operation and Maintenance & Repair training, for the duration, strength and locations specified in the RFP and Contract. The following may also be noted:-

(a) Details of training to be as per Para 1 above and **Annexure IV to Appendix 'E'**.

(b) The training should meet the needs of repair and maintenance of the complete equipment, use of SMTs/ STEs, test set up, assemblies/ sub-assemblies as per the stipulated repair philosophy. In addition to training on operation and diagnosis using STEs, training would also cover repair of STEs using procured spares for STEs.

(c) Training content should commensurate with the proposed Permissible Repair Schedule (PRS).

(d) The trained personnel should be able to vet the MRLS to align it to actual on ground requirement. The training should bring out utilization of provided MRLS items including procedure of their fitment/ repair.

(e) A movie should be made of entire training class with titles for reference in future. Movie should also include stepwise use of SMTs/ STEs.

(f) The costs for aggregates and training must only be indicated in the commercial proposal.

7. **Sufficiency Clause**. Bidder will give an undertaking that the proposed Engineering Support Package (ESP) is sufficient and agree to carry out any change to the ESP (to include Technical Literature and Training Aggregates) under the provisions of this clause within the existing commercial quotes. On termination of training, technicians should be capable of carrying out stipulated maintenance/repair to the full system. Else training will be repeated by the vendor **without any additional cost**.

8. **Itemised Spare Parts Price Lists (ISPPL**). ISPPL for all Spares or Line Replaceable Units (LRUs) of the equipment along with their Base price, annual escalation, delivery period and the MTBF be provided, at the time of submission of offer. The ISPPL shall also include details of the

source, especially for items which are COTS, bought-out, proprietary, etc. ISPPL shall also indicate interoperability of spares across projects, in case spares/equipment is already inducted in the Indian Armed Forces. The Bidder would submit a comprehensive Itemised Spare Parts Price Lists (ISPPL) comprising the following: -

(i) Complete Part Identification List (PIL) for all Spares or Line Replaceable Units (LRUs), along with corresponding unique part numbers. The list is not to be limited to

MRLS (Depot spares) or On-board Spares (spares along with the system) and should comprise entire list of spares of the equipment.

(ii) Base Price list of each of the spares along with annual escalation at time of submission of the offer.

(iii) Delivery Period of each spare after receipt of Order.

(iv) Mean Time Between Failure (MTBF), where applicable.

(v) Terms and conditions for supply of spares.

Illustrative Format for Submitting Details of Spares.

Ser No	Part No	Description	Qty/ MoQ (where applicable)	Unit Price List (along with annual escalation)	Delivery Period	If Recommended, as MRLS

Note :- The following details be included in the spare parts submission offer :-

(vi) Sourcing of spares wrt COTS and Proprietary.

(vii) Interoperability of spares across projects, in case the part/system/ subsystem, etc. is already inducted in some other equipment currently in service with the Indian Armed Forces, or has been contracted for supply to the Indian Armed Forces.

Annexure I to Appendix 'E'
(Refers to Para of 3 (a) of Appendix 'E')

MANUFACTURER'S RECOMMENDED LIST OF SPARES (MRLS)

Equipment : **Family of Software Defined Radio**

Original Equipment Manufacturer (OEM) : _____

Ser No	Manufacturer's Part No	Source of Supply	Nomenclature	No fitted in one equipment	Illustrated Spare Parts List (ISPL) Reference	Vital/ Essential/ Desirable (V/E/D)	Unit Cost	Recommended scale for Quantity 930 Equipment for two years			Total Cost			Remarks
								Field Repair (15)	I Level Repair (01)	Total	Field Repair (15)	I Level Repair (01)	Total	

Note 1

1. Maintenance spares/stores like lubricants, sealing compound, gases should be given separately giving source of supply and their Indian equivalent.

2. Spares for Major Unit Assemblies (MUAs)/ components repairs should be included under the column of Fd Repair as suggested by OEM.

3. In 'Remarks' column following information (if applicable) be given:-

   (a) If an item has a shelf/operational life it be marked as 'G' and life indicated.

   (b) Matching set of components be indicated.

   (c) Item which can be locally manufactured should be marked 'LM'.

   (d) Items which cannot be manufactured in India due to sophisticated design/technology may be marked as 'SI' (special item).

(e) If a component/assembly is common to-any other equipment earlier offered by the OEM-the same-be marked ‘CM’ and name of the equipment be indicated.

4. MRLS should be drawn out of the ‘Part List’ of the equipment, which should be given separately as part of Technical Manual Part IV.

5. If the main equipment consists of certain other supporting equipment like generator sets then MRLS should be prepared under respective heads.

6. MRLS is prepared as per the maintenance concept of the customer (Appendix ‘K’ to this RFP).

7. Items provided along with the equipment as spares should also be included in MRLS.

8. Modules/Shop Replaceable Unit (SRU)/ assemblies should be listed and their components should be included under them as to relate each item of spare to the module/ SRU/ assembly.

9. Complete MRLS should be costed separately for Field repairs as it is required to be included as part of ‘Total Costed Engineering Support Package’ (ESP). OEM may give cost details in confidence to Contract Negotiation Committee (CNC), but other details as above be provided during Maintainability Evaluation Trial (MET).

10. MRLS for any Test equipment being offered should also be provided on similar format as main equipment.

11. The list of spares should indicate Vital, Essential and Desirable as V/E/D as per details given below:-

(a) **Vital**. Items which are operationally critical to functioning of Equipment/Vehicle, where no redundancy is available or its failure endanger the Equipment / Operator’s safety. Generally, the percentage of such items will be up to 10% of the total range of items in the scales.

(b) **Essential**. Items whose failure although result in significant deterioration of Performance or failure of equipment, but their higher level assemblies/rotables are also included in the scales. Such items will be approx upto 80% of the total range of items in the scales.

(c) **Desirable**. These items are generally meant for ease of operation of equipment and failure of these does not result in significant reduction of performance of the equipment. The range of such items should be approx 10% of the total range of items included in the scales.

Annexure II to Appendix 'E'
(Refers to Para of 4 of Appendix 'E')

LIST OF SMT/STEs AND INFRASTRUCTURE

Equipment : **Family of Software Defined Radio Sets**

Original Equipment Manufacturer (OEM) : _____

Ser No	Manufacturer's Part No	Designation	Unit Cost	Nos Required			Brief Purpose	Remarks
				Field Repair (15)	I Level Repair (01)	Total		

Note 1

1. Prepare separate sheet for each type of equipment.

2. Specify in remarks column whether the Special Test Equipment (STE)/Special Maintenance Tools (SMT) can be used as general purpose equipment on any other kind of equipment.

3. For field repair quantity required should be for repair of one equipment at a time.

4. If test equipment is commercially available ex India, the source of supply be specified.

5. Test equipment for calibrating the STEs should be included in the list above.

6. Test equipment which is required to be provided by the customer should also be included in the list above.

7. Diagnostic software, including test fixtures for use on existing Automated Test Equipment, if any, also be included in the list above.

8. Infrastructure requirement if any for effective repair and maintenance be mentioned as a separate heading.

9. Installation of the SMTs/STEs/TJs will be done by the vendor at designated repair points at no additional cost.

10. Payment for SMTs/STEs/TJs will be done post installation and on receipt of satisfactory certificate by maintenance agency/EME.

Annexure III to Appendix 'E'
(Refers to Para of 5 of Appendix 'E')

TECHNICAL LITERATURE

Equipment : **Family of Software Defined Radio Sets**

Original Equipment Manufacturer (OEM) : _____

Ser No	Technical Literature	Unit Cost	Nos reqd for EME	Total Cost	Remarks
1.	User Handbook /Operators Manual		20		
2.	Design Specifications		01		
3.	Technical Manual. (a) Part I. Tech description, specifications, functioning of various Systems. (b) Part II. Inspection standards/ Maintenance tasks Repair procedures, materials used, fault diagnosis and use of Special Maintenance Tools (SMTs)/ Special Test Equipment (STE)s. (c) Part III. Procedure assembly/disassembly, repair up to Fd level, safety precautions. (d) Part IV. (i) Part list with drawing reference. (ii) List of SMT/STEs with Test Bench		20		
4.	Manufacturer's Recommended List of Spares(MRLS)		04		
5.	Illustrated Spare Parts list (ISPL)		20		
6.	Technical Manual on STE with drawing reference		As per distribution of STE + 03		
7.	CDs/ DVDs on the above Tech literature		20		
8	IETM of Class III & above		20		

Notes: 1. If certain technical literature is being provided free of cost it should be indicated in the remarks column.

Annexure IV to Appendix 'E'
(Refers to Para of 6(a) of Appendix 'E')

TRAINING & TRAINING AGGREGATES

Equipment: **Family of Software Defined Radio Sets**
Original Equipment Manufacturer (OEM): _____

Ser No	Description of Training Aggregate	**Scale for 930 Family of SDR Sets**	Unit Cost	Total Cost	Remarks
1.	Sectionised Equipment	-			
2.	Shop Replaceable Unit (SRU)/PCB/ Modules/assemblies as under :- (a) (b)	01 Set of each PCB			
3.	Computer Based Training package based on interactive multimedia to include :- (a) Full graphics, Animation test and sound. (b) Symptoms – fault correlation (expert system).	20			
4.	Training aids to include ;- (a) Charts (b) Slides (c) Training Broachers (d) Blow up diagram of each sub system. (e) Video film on repair/ maintenance demonstration	20			
5.	Cost of repair/ maintenance training for 34 technicians at OEM Premises.	(i) 'O' level training for 30 technicians for 6 x working days at OEM premises in two batches. (ii) 'I' level training for 04 x technicians for 12 working days at OEM premises in one batch.			
6.	Any other				

Total Cost _____

Appendix F
(Refers to Para 32 of RFP)

DEMONSTRATION METHODOLOGY

1. Demonstration will be conducted on a 'No Cost No Commitment' (NCNC) basis under the aegis of IHQ of MoD (Army). The broad plan for demonstration is given at **Annexure** to this methodology.

2. **Demo Location**. Infantry School, Mhow

3. **Demonstration Equipment**. Quantity Four (04) each of Handheld, Manpack and Vehicle based SDR Sets

4. **Terrain and Crew**. Terrain for demonstration will be selected at the discretion of the Empowered Committee. Crew for operating the demonstration equipment will be provided by the vendor. Adequate training & familiarization of crew will be carried out by the OEM.

5. **Transportation of Equipment**. Whenever movement of demonstration equipment is being undertaken by the vendors from one demonstration location to another, the equipment will be suitably sealed to prevent tampering. Being **NCNC** demonstration, all charges for transportation including freight, insurance, custom, octroi duties and any other local taxes shall be borne by the vendors. A representative of vendor shall accompany the equipment being transported at all times.

6. **Qualified Vendor Representatives**. The representatives of vendors present during demonstration should have adequate knowledge about the equipment to give the complete details of the equipment including stripping and assembling, testing procedures, SMTs/STEs etc. Observations and recommendations will be conveyed to respective vendors and the vendors will sign for the same.

7. **Security Clearance**. A maximum of eight (08) representatives per OEM will be allowed to witness the demonstration. The details of representatives who would attend the demonstration will be forwarded to Empowered Committee 30 days in advance. Non-receipt of details may result in delays in security clearance and will lead to non-attendance of the OEM representative.

8. **Retention and Returning of Equipment**. The demonstration equipment (One Set each of Handheld SDR, Manpack SDR and Vehicle Based SDR) of the L1 vendor will be retained by Empowered Committee till PDI.

DEMONSTRATION METHODOLOGY: SOFTWARE DEFINED RADIO (SDR) (HAND HELD)

Ser No	Parameter to be Demonstrated	Demonstration Method
1.	The V/UHF Hand Held (HH) SDR is envisaged to be used for the following applications in the Indian Army :- (a) Clear and Secure Combat Net Radio for voice and data communication. (b) Clear and Secure Mobile Adhoc Networks (MANET) and for networked voice, data and video communication.	
2.	**Frequency Range** 30-512 MHz	Demo by undertaking comn at 20 frequencies incl 30 MHz and 512 MHz.
3.	**Power Output.** The power output of the Hand-Held V/UHF SDR should be 4W or greater.	Demo
4.	**Communication Ranges**. The Hand-Held radio set should be able to provide a communication range of 3 Km or greater in line of sight in Narrow Band & Wideband waveforms in LoS mode.	Demo
5.	**Power Source.** The handheld form factor radio should be capable of working continuously for a minimum period of **10** hours at **1:1:8 or better** (TX: RX: Wait Ratio) with rechargeable and disposable batteries.	Demo
6.	**Battery Charging** battery charger with suitable connectors should be provided.	Visual Inspection
7.	**Waveforms**. The waveforms for the V/UHF SDR in all modes of operation (Clear - Fixed Frequency and Frequency Hopping Secure - Fixed Frequency and Frequency Hopping) are as under :– (a) **Voice**. Provides voice communication for ground to ground application. (b) **Narrow Band (NB) Data**. Provides voice and throughput data of 100 Kbps or more (with channel bandwidth of upto 250 KHz or less). (c) **Wide Band (NB) Data**. Provides voice and through put data of 1.0 Mbps or more (with channel bandwidth upto 2.5 MHz or less).	Demo alongwith CoC & internal test reports
8.	The HH SDR should have the capability to load additional waveforms. The Handheld form factor should be capable of storing multiple waveforms as necessary. It should be possible to load and work with the desired waveform without switching off or rebooting the radio set.	Vendor/ OEM CoC
9.	**Waveform Loading and Waveform Development Tool.** The HH SDR should be provided with a waveform loading mechanism and waveform development tool or fill gun or both. The waveform loading mechanism will enable loading of new waveforms into the SDR to be carried in the field.	Demo

Ser No	Parameter to be Demonstrated	Demonstration Method
10.	**Modes of Operation.** The SDR should be provided with the Squelch mode of operation.	Demo
11.	**Data Capabilities.** (a) The V/UHF HH SDR should support data transmission at following data rates:- (i) **Narrow Band**. Provides voice and throughput data of 100 Kbps or more (with channel bandwidth atleast 25 KHz.) (ii) **Wide Band.** Provides voice and throughput data of 1.0 Mbps or more (with channel bandwidth atleast 2.5 MHz). (b) The equipment should be able to transmit voice, data and video simultaneously. It should be possible to transmit data in Net Radio Mode of operation (one to one or one to many or one to all) as well as in MANET mode (unicast, multicast and broadcast).	Demo
12.	**Mobile Adhoc Network (MANET)** :- (a) The SDR should be able to establish MANET. The requirement of number of modes is 16 or more in Narrow Band MANET and 32 or more Nodes in Wide Band MANET. (b) The MANET should support adaptive bandwidth allocation and master less dynamic architecture. The details of MANET working are enumerated below :- **Voice** (i) MANET parameters of Narrow Band Voice-03 Hops (Min) with Minimum Range Point to point distance of at least 3 km and 9 km over 3 hops in clear line of sight conditions. (ii) MANET parameters of Wide Band Voice - 03 Hops (Min) with Minimum Range of point to point distance of at least 6 km over 3 hops in clear line of sight conditions. **Data** (i) MANET parameters of Narrow Band Data 03 Hops (Min) with minimum Range Relay data to a distance of at least 7 km and atleast 9 km over 05 hops in clear line of sight conditions. (ii) MANET parameters of Wide Band of data 03 Hops (Min) with minimum Range Relay data to a distance of at least 7 km and atleast 10 km over 05 hops in clear line of sight conditions.	Demo over min 3 Hops to be given and Vendor/ OEM CoC for balance alongwith test reports

Ser No	Parameter to be Demonstrated	Demonstration Method
13.	**BER**. The SDR should have built in FEC to be able to Detect and correct channel BER.	Vendor/ OEM CoC
14.	**ECCM (Anti Jamming and Anti Detection).** The SDR shall provide Frequency Hopping (FH) with a Hop rate of 250 Hops or more per second in entire frequency band. The Radio set shall have the capability to have at least 10 preset user selectable and configurable frequency tables with at least 50 frequencies spot in a table.	Demo & Vendor coC
15.	**Antenna.** The SDR should have suitable antennas which cover the entire V/UHF frequency range for the radio set.	Demo
16.	**Interfaces**. The equipment should have the interfaces for the following:– (a) Ethernet. (b) Interfaces required for exploiting full functionality of the equipment.	Demo
17.	The SDR interfaces, accessories, cables, cords, switches and displays will have ruggedization in accordance with minimum Mil Standard 810-F.	Vendor/ OEM CoC & QA
18.	**Booting and Switching Time.** <= 120 secs.	Demo
19.	It should be possible to load the waveforms without power - off and rebooting. The SDR should have at least 10 Pre-set channels operable by knob.	Demo
20.	On powering up. The SDR should offer selection of the last operated waveform, or any other waveform residing in the SDR.	Demo
21.	Applications should be provided to exploit the SDR data capability.	Demo
22.	**Data Terminal Equipment (DTE).** Ruggedized DTE will be supplied with the Handheld and should support the following :- (a) Be of such form factor that is wearable by soldier in | his forearm. (b) Facilitate sending of voice, video, short messages and data. (c) Map based GUI giving geographical location of radio sets in the network. (d) GUI based management of radio network. (e) Applications should be provided for exploitation of the functions given above.	Demo
23.	The display unit should have a full HD display of (not greater than) 7" LED screen, touch screen operable with finger and stylus. The DTE should have Processor of at least 64 Bit, 2 Ghz or better, RAM - 4 GB or better, Memory - 64 GB or better. The weight of the DTE including battery should not exceed 1 Kg (excluding connectors). There should be suitable carrying case provided for the DTE. DTE should be Mil Std 810 F/ 810 G.	(a) Functioning of DTE – Demo (b) Balance – Vendor/ OEM CoC
24.	The networking protocol suite should employ Internet Protocol (IP). IPV4 will be supported. Ancillaries and accessories as required to interface with the SDR should be provided.	Demo

<table>
<tr><th>Ser No</th><th>Parameter to be Demonstrated</th><th>Demonstration Method</th></tr>
<tr><td>25.</td><td><u>Positioning, Navigation and Timing</u>

(a) <u>GPS</u>. The SDR should have an inbuilt GNSS receiver catering to multiple GNSS services like GPS.

(b) <u>Synchronization</u>. The SDR should support synchronization.</td><td>Demo & Vendor/ OEM CoC</td></tr>
<tr><td>26.</td><td><u>Software Communication Architecture (SCA)</u>. The SDR system architecture should be in accordance with the SCA version 2.2.2 or later.</td><td>Vendor/ OEM CoC with test reports, if available</td></tr>
<tr><td>27.</td><td><u>Security</u>. The equipment should support the following:-
Industrial grade secrecy be provided to the secure information being passed on the SDR. AES 256 and another equivalent algorithm to be provided for secrecy.</td><td>Demo &
Vendor/ OEM CoC</td></tr>
<tr><td>28.</td><td><u>Key Management</u>. The cryptographic algorithms and keys shall be capable of being loaded into the security module via a key loading device.</td><td>Demo &
Vendor/ OEM CoC</td></tr>
<tr><td>29.</td><td><u>Physical and Electrical Characteristics</u>. The set should have following electrical characteristics : -

(a) <u>Transmitter</u>.

<table>
<tr><th>Ser No</th><th>Characteristic</th><th>Values</th></tr>
<tr><td>(i)</td><td>Frequency</td><td>+ 1 ppm</td></tr>
<tr><td>(ii)</td><td>Harmonics</td><td>As per Mil Std 461 F</td></tr>
<tr><td>(iii)</td><td>Spurious Emission</td><td>As per Mil Std 461 F</td></tr>
<tr><td>(iv)</td><td>RF Head</td><td>One</td></tr>
<tr><td>(v)</td><td>Self-Protection</td><td>VSWR and Automatic power reduction in event of excess temperature</td></tr>
</table>
(b) <u>Receiver.</u>

<table>
<tr><th><u>Ser No</u></th><th><u>Characteristic</u></th><th><u>Values</u></th></tr>
<tr><td>(i)</td><td>Sensitivity</td><td>10 dB SINAD (min) for RF input level of 0.7 micro volt</td></tr>
</table></td><td>Vendor/ OEM CoC with test reports, if available</td></tr>
<tr><td>30.</td><td><u>Weight</u>. Less than or equal to 1.5 Kg including Battery</td><td>Physical Measurement</td></tr>
<tr><td>31.</td><td><u>Physical Dimensions (HxWxD) in cm</u>. Less than or equal to 15 x 10 x 6 without battery.</td><td>Physical Measurement</td></tr>
<tr><td>32.</td><td><u>Connectors</u>. The SDR should provide interface connectors for connecting data terminal and other accessories and parts of the equipment.</td><td>Demo</td></tr>
</table>

Ser No	Parameter to be Demonstrated	Demonstration Method
33.	**Controls** The HH SDR should have a front panel having control and selector knobs. Selective entry of key and other data should be possible with the help of suitable loading device. The display should have antiglare feature for daytime function and be such that it is visible at night also. The data and radio parameters should not be lost when changing battery and turning the radio off. To facilitate the operation, the SDR should incorporate a display which displays status as necessary for efficient working including battery status, freq ch being used etc.	Demo
34.	**EMI/EMC Specifications** The EMI/EMC standards as per Mil Std 461F or better should be complied with. There should be no interference when radio systems are co - located and being used concurrently.	Vendor/ OEM CoC with test reports, if available
35.	**Field Operating Temperature** The equipment should be capable of functioning satisfactorily under all prevailing conditions The equipment should be able to withstand following - Field Operating Temperature' conditions Between -20°C to +55°C	Vendor/ OEM CoC
36.	**Environmental Standards**. All the environments tests including temperature shall be carried out in accordance with MIL STD 810 G.	Vendor/ OEM CoC
37.	**Emergency Erasure** Facility for emergency erasure should be inbuilt to erase all the keys and algorithm.	Demo & Vendor/ OEM CoC
38.	**Repair and Maintenance** Equipment should be modular in construction. Essential spare parts, SMT/STE/TJs, Training Aggregate. Technical Literature and ancillaries for carrying out repairs and maintenance of SDR should be provided.	Demo All aspects of ESP to be ratified by EME rep
39.	**BITE** Built in Test (BITE) supporting diagnostics should be provided It should be able to diagnose a fault down to card level.	Demo All aspects of ESP to be ratified by EME rep
40.	**Visual Alarm Features:** Visual alarm features should be provided for self – test failure.	Demo
41.	**Reliability**. The equipment shall be capable of continuous operations for atleast 72 Hrs on a single set basis	Vendor/ OEM CoC.
42.	**Diagnostic Facility.** The SDR should have the facility of carrying out diagnostics. Complete software of the SDR should be restorable in field conditions during maintenance with manual intervention.	Demo All aspects of ESP to be ratified by EME rep
43.	**Interoperability:-** HH SDR should be interoperable in all mode of operations with the Manpack & Veh Based SDR sets.	Common Demonstration among Handheld, Manpack & Veh based SDR Sets

DEMONSTRATION METHODOLOGY: SOFTWARE DEFINED RADIO (SDR) MANPACK VERSION

Ser No	Parameter to be Demonstrated	Demonstration Method
1.	The V/UHF SDR is envisaged to be used for the following applications in the Indian Army :- (a) Clear and Secure Combat Net Radio for voice and data Communication. (b) Clear and Secure Mobile Adhoc Networks (MANET) and for networked voice, data and video communication.	
2.	**Frequency Range**. 30 – 512 MHz	Demo by undertaking comn at 20 frequencies incl 30 MHz and 512 MHz.
3.	**Power Output**. The power output of the Man Pack V/UHF should be 10W or grater with minimum two lower power output configurations.	Demo
4.	**Communication Ranges**. The Man-Pack radio set should be able to provide a communication range of 10 km or greater in line of sight with road antenna.	Demo
5.	**Power Source**. The Man-Pack form factor radio should be capable of working continuously for a minimum period of 8 hours at **1:1:8 or better** (TX: RX: Wait Ratio) with rechargeable and disposable batteries and for 12 hrs with 12V 75 AHC secondary batteries. The Man-Pack radio should also have the facility to work off 230±20% volt AC at 50Hz±10% using provided adaptor (adaptor forms part of the equipment).	Demo
6.	**Battery Charging**. Suitable charger should be provided to charge the batteries from AC Mains. It should be able to charge at least two batteries at the same time.	Visual Inspection
7.	**Waveforms**. The waveforms for the V/UHF SDR in all modes of operation (Clear - Fixed Frequency and Frequency Hopping Secure - Fixed Frequency and Frequency Hopping) are as under :– (a) **Voice**. Provides voice communication for ground to ground application. (b) **Ground to Air Voice**. Provide voice communication for ground to air application. (c) **Narrow Band (NB) Data**. Provides voice and throughput data of 100 Kbps or more (with channel bandwidth of upto 250 KHz or less). (d) **Wide Band (WB) Data**. Provides voice and throughput data of 1.0 Mbps or more (with channel bandwidth upto 2.5 MHz or less).	Demo alongwith CoC & internal test reports
8.	The SDR should have the capability to load additional waveforms. The Man-Pack form factor should be capable of storing multiple waveforms as necessary. It should be possible to load and work with the desired waveform without switching off or rebooting the radio set.	Vendor/ OEM CoC

9.	**<u>Waveform Loading and Waveform Development Tool</u>**. The SDR should be provided with a waveform loading and waveform development tool or fill gun or both. The waveform loading tool will enable loading of new waveforms into the SDR to be carried out in the field.	Demo
10.	**<u>Modes of Operation</u>**. The SDR should be provided with Squelch mode of operation.	Demo
11.	**<u>Data Capabilities</u>.** (a) The V/UHF SDR should support data transmission at following data rates:– (i) **<u>Narrow Band</u>**. 100 Kbps throughput or more (with channel bandwidth atleast 25KHz) (ii) **<u>Wide Band</u>**. 1.0 Mbps throughput or more (with channel bandwidth atleast 2. 5 MHz) (b) The equipment should be able to transmit voice, data and video. It should be possible to transmit data in Net Radio Mode of operation as well as in MANET mode.	Demo
12.	**<u>Mobile Adhoc Network (MANET).</u>** (a) The SDR should be able to establish MANET. The requirement of number of modes is 16 or more is Narrow Band MANET and 32 or more Nodes in Wide Band MANET. (b) The MANET should support adaptive bandwidth allocation and master less dynamic architecture. The details of MANET working are enumerated below :- **<u>Voice</u>** (i) MANET parameters of Narrow Band Voice 03 Hops (Min) with Minimum Range Point to point distance of at least 10 km and 30 km over 3 hops in clear line of sight conditions. (ii) MANET parameters of Wide Band Voice 03 Hops (Min) with Minimum Range of point to point distance of at least 10 km and 30 km over 3 hops in clear line of sight conditions. **<u>Data</u>** (i) MANET parameters of Narrow Band Data 05 Hops (Min) with minimum Range Relay data to a distance of atleast 50km over 05 hops in clear line of sight conditions. (ii) MANET parameters of Wide Band of data 05 Hops (Min) with Minimum Range of Relay data to a distance of at least 35km over 05 hops in clear line of sight conditions.	Demo over min 3 Hops to be given and Vendor/ OEM CoC for balance alongwith test reports
13.	**<u>BER</u>**. The SDR should have built in FEC to be able to detect and correct channel BER.	Vendor/ OEM CoC

14.	**ECCM (Anti Jamming and Anti Detection).** The SDR shall provide Frequency Hopping (FH) with a Hop rate of 250 Hops or more per second in entire frequency band. The Radio set shall have the capability to have at least 10 preset user selectable and configurable frequency tables with at least 50 frequencies spot in a table.	Demo & Vendor coC
15.	**Antenna**. The SDR should have broadband antennas which cover the entire V/UHF frequency range for the radio set. All aerials / antennas for the Man-Pack radios should be of variable height and have a flexible mount. Man-Pack radio set should be provided with Tape/Whip antenna of 3.1m or less and rod or long whip antenna of length not more than 5m. The following types of antennas should be provided: - (a) Antennas which are suitably integrated in Man-Pack version. (b) GNSS antenna.	Demo
16.	**Interfaces**. The equipment should have the interfaces for the following:– (a) Ethernet. (b) Interfaces required for exploiting full functionality of the equipment.	Demo
17.	The SDR, interfaces, accessories, cables, cords, switches and displays will have ruggedization in accordance with latest version of Mil Std 810 F as applicable.	Vendor/ OEM CoC & QA
18.	**Accessories** **Handset**. The SDR should have a handset.	Demo
19.	**Loud Speaker**. A loud speaker for field combat use with a facility to attach to the belt or harness should be provided.	Demo
20.	**Carrying Harness**. The weight of the carrying harness should be less than 2.5kgs. Harness must be made of strong material and the frame must be comfortable to wear during long marches.	Demo & Vendor/OEM CoC
21.	Any other accessories that facilitate in the efficient functioning of the SDR to be provided, conforming to Mil Std 810 F as applicable.	Vendor/ OEM CoC & QA
22.	**Booting and Switching Time.** <= 120 secs.	Demo
23.	It should be possible to load the waveforms without power–off and rebooting. The SDR should have at least 10 preset channels.	Demo & Vendor/ OEM CoC
24.	Applications should be provided to exploit the SDR data capability. The SDR should provide for user defined and free message formats.	Demo
25.	**Data Terminal Equipment (DTE)**. Ruggedized DTE will be supplied with the Man-Pack and should support the following:– (a) Facilitate sending of voice, video, short messages and data. (b) GUI based management of radio network. (c) Applications should be provided for exploitation of the functions given above. (d) Map based GUI giving geographical location of radio sets in the network.	Demo
26.	The display unit of DTE should have a full HD display of (at least) 7" LED screen which is anti–glare, sunlight readable, touch screen operable with finger and stylus. The DTE should have Processor of at least 64 Bit, 2 Ghz or better, RAM – 8 GB or better, Memory – 64 GB or better. The weight of	(a) Functioning of DTE – Demo

<table>
<tr><td></td><td>the DTE including battery should not exceed 1 kg. There should be suitable carrying case provided for the DTE. DTE should be MIL STD 810F/ 810 G compliant.</td><td>(b) Balance – Vendor/ OEM CoC</td></tr>
<tr><td>27.</td><td>The networking protocol suite should employ Internet Protocol (IP). IPV4 will be supported. Ancillaries and accessories as required to interface with the SDR should be provided.</td><td>Demo</td></tr>
<tr><td>28.</td><td><u>Positioning, Navigation and Timing</u>

(a) <u>GPS</u>. The SDR should have an inbuilt GNSS receiver catering to multiple GNSS services like GPS.

(b) <u>Synchronization</u>. The SDR should support synchronization.</td><td>Demo & Vendor/ OEM CoC</td></tr>
<tr><td>29.</td><td><u>Navigation</u>. The SDR should support integrating Map based navigation system, in the form of a suitable application within the supplied data terminal equipment (DTE).</td><td>Demo & Vendor/ OEM CoC</td></tr>
<tr><td>30.</td><td><u>Software Communication Architecture (SCA).</u> The SDR system architecture should be in accordance with the SCA version 2.2.2 or later.</td><td>Vendor/ OEM CoC with test reports, if available</td></tr>
<tr><td>31.</td><td><u>Security</u>. The equipment should support the following:-
Industrial grade secrecy be provided to the secure information being passed on the SDR. AES 256 and another equivalent algorithm to be provided for secrecy.</td><td>Demo & Vendor/ OEM CoC</td></tr>
<tr><td>32.</td><td><u>Key Management</u>. The cryptographic algorithms and keys shall be capable of being loaded into the security module via Key loading device.</td><td>Demo & Vendor/ OEM CoC</td></tr>
<tr><td>33.</td><td><u>Key Handling and Storage</u>. The SDR shall support key loading using key loading device The SDR shall be capable of secure storage of key material for duration as specified by user.</td><td>Demo & Vendor/ OEM CoC</td></tr>
<tr><td>34.</td><td><u>User Authentication</u>. The SDR should be password protected for normal usage.</td><td>Demo & Vendor/ OEM CoC</td></tr>
<tr><td>35.</td><td><u>Physical and Electrical Characteristics</u>. The set should have following electrical characteristics:-
(a) <u>Transmitter</u>.
<table><tr><th><u>Ser</u></th><th><u>Characteristic</u></th><th><u>Values</u></th></tr><tr><td>(i)</td><td>Frequency Accuracy</td><td><u>+</u> 1 ppm</td></tr><tr><td>(ii)</td><td>Harmonics</td><td>As per MIL STD 461E</td></tr><tr><td>(iii)</td><td>Spurious Emission</td><td>As per MIL STD 461E</td></tr></table>(b) <u>Receiver</u>.
<table><tr><th><u>Ser</u></th><th><u>Characteristic</u></th><th><u>Values</u></th></tr><tr><td>(i)</td><td>Sensitivity</td><td>10 dB SINAD (min) for RF input level of 0.7 micro volt</td></tr></table></td><td>Vendor/ OEM CoC with test reports, if available</td></tr>
<tr><td>36.</td><td><u>Weight.</u> Less than 5 kg including battery (less other accessories).</td><td>Physical Measurement</td></tr>
<tr><td>37.</td><td><u>Physical Dimensions (HxWxD) in mm</u>. 370 x260x110 including battery.</td><td>Physical Measurement</td></tr>
<tr><td>38.</td><td><u>Connectors</u>. The SDR should have a front panel having control and selector knobs, display and keypad for SDR functioning and programming</td><td>Demo</td></tr>
</table>

	of parameters. Selective entry of key and other data should be possible with the help of keypad or fill–gun. The display should have antiglare feature for daytime function and be such that it is visible at night also. The data and radio parameters should not be lost when changing battery and turning the radio off. To facilitate the operation, the SDR should incorporate a display which displays status as necessary for efficient working including battery status, freq ch being used etc.	
39.	**Controls**. The SDR should have a front panel having control and selector knobs for SDR functioning and programming of parameters.	Demo
40.	**EMI/EMC Specifications**. The EMI/EMC standards as per MIL STD 461E or better and ESD test (MIL STD 464) should be complied with. There should be no interference when radio systems are co-located and being used concurrently.	Vendor/ OEM CoC with test reports, if available
41.	**Field Operating Temperature**. The equipment should be capable of functioning satisfactorily under all prevailing conditions. The equipment should be able to withstand following 'Field Operating Temperature' conditions:- (a) Minimum Temperature: Between minus 20^0C to minus 10^0C. (b) Maximum Temperature : Between 40^0 C to 45^0 C.	Vendor/ OEM CoC
42.	**Environmental Standards**. All the environments tests including temperature shall be carried out in accordance with MIL STD 810 F.	Vendor/ OEM CoC
43.	**Reliability, Maintenance and Miscellaneous Safety**. The equipment should have safeguards against the following:– (a) Reverse polarity. (b) Power and line surge spikes. (c) Short /open circuit antenna connection. (d) An adaptor which can be fitted in SDR to protect against lighting protection. (e) Over voltage/under voltage protection.	Demo All aspects of ESP to be ratified by EME rep
44.	**Emergency Erasure**. Facility for emergency erasure should be inbuilt to erase all the keys and algorithm.	Demo & Vendor/ OEM CoC
45.	**Repair and Maintenance**. Equipment should be modular in construction. Essential spare parts, SMT/STE/TJs, Training Aggregate, Technical Literature and ancillaries for carrying out repairs and maintenance of SDR should be provided.	Demo All aspects of ESP to be ratified by EME rep
46.	**BITE**. Built in Test (BITE) supporting diagnostics provided should be able to diagnose fault down to card level.	Demo All aspects of ESP to be ratified by EME rep
47.	**POST**. The SDR should perform Power On Self-Test (POST) functions to determine the health status of the equipment.	Demo All aspects of ESP to be ratified by EME rep

48.	**<u>Visual Features</u>**. Visual features should be provided for self-test failure.	Demo
49.	**<u>Reliability</u>**. The equipment shall be capable of continuous operations for atleast 72 Hrs on a single set basis.	Vendor/ OEM CoC
50.	**<u>Diagnostic Facility</u>**. The SDR should have the facility of carrying our diagnostics. It should be possible to initiate the diagnostics feature after an authentication password. Complete software of the SDR should be restorable in field conditions during maintenance with manual intervention	Demo All aspects of ESP to be ratified by EME rep
51.	**Interoperability:-** Manpack SDR sets should be interoperable in all mode of operations with the Hand Held & Veh Based SDR sets.	Common Demonstration among Handheld, Manpack & Veh based SDR Sets

DEMONSTRATION METHODOLOGY: SOFTWARE DEFINED RADIO (SDR) (VEHICLE BASED)

Ser No	Parameter to be Demonstrated	Demonstration Method
1.	**Frequency Range**. 30 – 512 MHz	Demo by undertaking comn at 20 frequencies incl 30 MHz and 512 MHz.
2.	**Power Output**. The power output of the SDR should be more than 50W with minimum two lower power output configurations.	Demo
3.	**RF Head.** SDR should provide one RF head.	Demo
4.	**Communication Ranges**. The radio should be able to provide a communication range of atleast 15 Km or greater in line of sight with rod Antenna.	Demo
5.	**Power Source**. Nominal 24 V (or higher)	Visual Inspection
6.	**Waveforms**. The waveforms for the V/UHF SDR in all modes of operation (Clear – Fixed Frequency and Frequency Hopping; Secure - Fixed Frequency and Frequency Hopping) should support the following:– (a) **Voice**. Provides voice communication for ground to ground application in AM and FM. (b) **Narrow Band (NB) Data**. Provides voice and throughput data of 100 Kbps or more (with channel bandwidth of atleast 25 KHz). (c) **Wide Band (WB) Data**. Provides voice and throughput data of 1.0 Mbps or more (with channel bandwidth atleast 2.5 MHz).	Demo alongwith CoC & internal test reports
7.	The SDR should have the capability to load additional waveforms. The 'B' Vehicle form factor should be capable of storing multiple waveforms as necessary. It should be possible to load and work with the desired waveform without switching off or rebooting the radio set.	Vendor/ OEM CoC
8.	**Waveform Loading and Waveform Development Tool**. The SDR should be provided with a waveform loading tool or fill gun or both. The waveform loading tool will enable loading of new waveforms into the SDR to be carried out in the field.	Demo
9.	**Modes of Operation**. The SDR should be provided with the Squelch mode of operation.	Demo
10.	**Data Capabilities.** (a) The SDR should support data transmission at following data rates:– (i) **Narrow Band**. 100 Kbps throughput or more. (ii) **Wide Band**. 1.0 Mbps throughput or more. (b) The equipment should be able to transmit voice, data and video. It should be possible to transmit data in Net Radio Mode of operation as well as in MANET mode.	Demo

11.	**Mobile Adhoc Network (MANET)** The SDR should be able to establish MANET with 16 or more radios in NB and 32 or more in WB. The MANET should support adaptive bandwidth allocation and master-less dynamic architecture. (a) **Voice.** (i) MANET parameter of Narrow Band Voice 03 Hops (Min) with Minimum Range Point to point distance of at least 10 km and 30 km over 3 hops in clear line of sight conditions. (ii) MANET parameter of Wide Band Voice 03 Hops (Min) with Minimum Range of Point to point distance of at least 10 km and 30 km over 3 hops in clear line of sight conditions. (b) **Data.** (i) MANET parameters of Narrow Band Data 04 Hops (Min) with minimum Range Relay data to a distance of at least 40 km over 04 hops in clear line of sight conditions. (ii) MANET parameters of Wide Band of data 05 Hops (Min) with Minimum Range of Relay data to a distance of at least 50km over 05 hops in clear line of sight conditions.	Demo over min 3 Hops to be given and Vendor/ OEM CoC for balance alongwith test reports
12.	**BER**. The SDR should have built in FEC to be able to detect and correct channel BER.	Vendor/ OEM CoC
13.	**ECCM (Anti Jamming and Anti Detection).** The SDR shall provide Frequency Hopping (FH) with a Hop rate of 250 Hops or more per second in entire frequency band. The Radio set shall have the capability to have at least 10 preset user selectable and configurable frequency tables with at least 50 frequencies spot in a table.	(a) Demo & Vendor CoC
14.	**Antenna**. The SDR should have broadband antennas which cover the entire V/UHF frequency range for the radio set. All aerials / antennas for the radios should be of variable height and have a flexible mount. The following types of antennas should be provided:– (a) Radio Set should be provided with Rod or long whip antenna. (b) Antennas including GNSS antenna which are suitably integrated in 'B' Vehicle.	Demo
15.	**Interfaces**. The equipment should have the interfaces for the following:– (a) Ethernet. (b) Interfaces required for exploiting full functionality of the equipment.	Demo

16.	The SDR, interfaces, accessories, cables, cords, switches and displays will have ruggedization in accordance with Mil Std 810 F as applicable.	Vendor/ OEM CoC & QA
17.	**Handset**. The SDR should have a handset.	Demo
18.	Any other accessories that facilitate in the efficient functioning of the SDR to be provided, conforming to Mil Std 810 F as applicable.	Vendor/ OEM CoC & QA
19.	**Booting and Switching Time.** <= 120 secs.	Demo
20.	It should be possible to load the waveforms without power–off and rebooting.	Demo
21.	On powering up, the SDR should offer selection of the last operated waveform, or any other waveform residing in the SDR.	Demo
22.	Applications should be provided to exploit the SDR data capability. The SDR should provide for user defined and free message formats.	Demo
23.	**Data Terminal Equipment (DTE)**. Ruggedized DTE will be supplied with the Man-Pack and should support the following:– (a) Facilitate sending of voice, video, short messages and data. (b) GUI based management of radio network. (c) Applications should be provided for exploitation of the functions given above. (d) Map based GUI giving geographical location of radio sets in the network.	Demo
24.	The display unit should have a full HD display of (at least) 7" LED screen which is anti–glare, sunlight readable, touch screen operable with finger and stylus. The DTE should have Processor of at least 64 Bit, 2 Ghz or better, RAM – 8 GB or better, Memory – 64 GB or better. The weight of the DTE including battery should not exceed 1 kg. There should be suitable carrying case provided for the DTE. DTE should be Mil Std 810 F / 810G compliant.	(a) Functioning of DTE – Demo (b) Balance – Vendor/ OEM CoC
25.	The networking protocol suite should employ Internet Protocol (IP). IPV4 will be supported. Ancillaries and accessories as required to interface with the SDR should be provided.	Demo
26.	**Positioning, Navigation and Timing** (a) **GPS**. The SDR should have an inbuilt GNSS receiver catering to multiple GNSS services like GPS. (b) **Synchronization**. The SDR should support synchronization.	Demo & Vendor/ OEM CoC
27.	**Navigation**. The SDR should support integrating Map based navigation system, in the form of a suitable application within the supplied data terminal equipment (DTE).	Demo & Vendor/ OEM CoC
28.	**Software Communication Architecture (SCA).** The SDR system architecture should be in accordance with the SCA version 2.2.2 or later.	Vendor/ OEM CoC with test reports, if available
29.	**Security.** The equipment should support the following:- Industrial grade secrecy be provided to the secure information being passed on the SDR. AES 256 and another equivalent algorithm to be provided for secrecy.	Demo & Vendor/ OEM CoC

<table>
<tr><td>30.</td><td><u>Algo Handling and Storage</u>. Algo should be user selectable. Provision for additional algo loading should be provided. Emergency erasure facility should be provided.</td><td>Demo & Vendor/ OEM CoC</td></tr>
<tr><td>31.</td><td><u>Physical and Electrical Characteristics</u>. The set should have following electrical characteristics:-
(a) <u>Transmitter</u>.
<table><tr><th><u>Ser</u></th><th><u>Characterstic</u></th><th><u>Values</u></th></tr><tr><td>(i)</td><td>Frequency Accuracy</td><td><u>+</u> 1 ppm</td></tr><tr><td>(ii)</td><td>Harmonics</td><td>As per Mil Std 461E</td></tr><tr><td>(iii)</td><td>Spurious Emission</td><td>As per Mil Std 461E</td></tr></table>(b) <u>Receiver</u>.
<table><tr><th><u>Ser</u></th><th><u>Characterstic</u></th><th><u>Values</u></th></tr><tr><td>(ii)</td><td>Sensitivity</td><td>10 dB SINAD (min) for RF input level of 0.7 micro volt</td></tr></table></td><td>Vendor/ OEM CoC with test reports, if available</td></tr>
<tr><td>32.</td><td><u>Weight.</u> Less than 30 kg including battery (less other accessories).</td><td>Physical Measurement</td></tr>
<tr><td>33.</td><td><u>Physical Dimensions (HxWxD) Radio Sets (RS)</u>. Less than or equal to the following dimensions:-
(a) Width - 350 mm
(b) Height - 250 mm
(c) Depth – 400 mm</td><td>Physical Measurement</td></tr>
<tr><td>34.</td><td><u>Connectors</u>.The SDR should provide interface connectors for connecting data terminal and other accessories and parts of the equipment.</td><td>Demo</td></tr>
<tr><td>35.</td><td><u>Controls</u>. The SDR should have a front panel having control and selector knobs, display and keypad for SDR functioning and programming of parameters. Selective entry of key and other data should be possible with the help of keypad or fill–gun. The display should have antiglare feature for daytime function and be such that it is visible at night also. The data and radio parameters should not be lost when changing battery and turning the radio off.

To facilitate the operation, the SDR should incorporate a display which displays status as necessary for efficient working including battery status, freq ch being used etc.</td><td>Demo</td></tr>
<tr><td>36.</td><td><u>EMI/EMC Specifications</u>. The EMI/EMC standards as per Mil Std 461E or better and ESD test (Mil Std 464) should be complied with. There should be no interference when radio systems are co-located and being used concurrently.</td><td>Vendor/ OEM CoC with test reports, if available</td></tr>
<tr><td>37.</td><td><u>Field Operating Temperature</u>. The equipment should be capable of functioning satisfactorily under all prevailing conditions. The equipment should be able to withstand following ‘Field Operating Temperature’ conditions:-</td><td>Vendor/ OEM CoC</td></tr>
</table>

	(a) **Minimum Temperature**: Between minus 20^0C to minus 10^0C. (b) **Maximum Temperature**: Between 40^0 C to 45^0 C.	
38.	**Environmental Standards**. All the environment tests including temperature shall be carried out in accordance with the latest version of Mil Std 810 - F as applicable.	Vendor/ OEM CoC
39.	**Reliability, Maintenance and Miscellaneous Safety**. The equipment should have safeguards against the following:– (a) Reverse polarity. (b) Power and line surge spikes. (c) Short /open circuit antenna connection. (d) Over voltage / under voltage protection.	Demo All aspects of ESP to be ratified by EME rep
40.	**Emergency Erasure**. Facility for emergency erasure should be inbuilt to erase all the keys and algorithms.	Demo & Vendor/ OEM CoC
41.	**Repair and Maintenance**. Equipment should be modular in construction. Essential spare parts, SMT/STE/TJs, Training Aggregate, Technical Literature and ancillaries for carrying out repairs and maintenance of SDR should be provided.	Demo All aspects of ESP to be ratified by EME rep
42.	**BITE**. Built in Test (BITE) supporting diagnostics should be provided. It should be able to diagnose a fault down to card level.	Demo All aspects of ESP to be ratified by EME rep
43.	**POST**. The SDR should perform Power On Self-Test (POST) functions to determine the health status of the equipment.	Demo All aspects of ESP to be ratified by EME rep
44.	**Visual Features**. Visual should be provided for self-test failure.	Demo
45.	**Interoperability**. Veh based SDR should be interoperable in all mode of operations with the Manpack & Hand Held SDR sets.	Common Demonstration among Handheld, Manpack & Veh based SDR Sets

Appendix G
(Refers to Para 45 of RFP)

COMMERCIAL CLAUSES

1. **Payment Terms**

1.1 **INCOTERMS for Delivery**

The delivery of goods will be based on DDP INCOTERMS-2020 with ultimate consignee as under: -

1.1.1. SDR Sets – Leh,

1.1.2 MRLS, SMTs/STEs, Training Jigs & other product support – COD, Agra.

1.2. **Currency of Payment**

1.2.1 Indian bidders should submit their bids in Indian Rupees.

1.3 **Contract Price and Requirement of Bank Guarantees**

1.31. **Total Contract Price**. The Total Contract Price will be the final price negotiated by CNC including taxes and duties applicable at the time of signing of Contract.

1.3.2 **Base Contract Price**. The Base Contract Price will be considered as Total Contract Price excluding taxes and duties applicable at the time of signing of Contract.

1.3.3 **Bank Guarantee(s)**. For the purpose of payment of Advances to the Bidder and submission of various Bank Guarantees by the Bidder i.e Advance Payment Bank Guarantee (APBG) and Additional Bank Guarantee (ABG), as applicable, Base Contract price will be considered. For Performance cum Warranty Bank Guarantee (PWBG), Total Contract Price including taxes and duties is to be considered.

1.3.4 All Bank Guarantee(s) requirements viz Advance Payment Bank Guarantee (APBG), Performance-cum-Warrantee Bank Guarantee (PWBG), Performance Bank Guarantee (PBG) etc are to be submitted as per following:-

1.3.4.1 The Bank Guarantee(s) shall be from any Indian Public or Private Scheduled Commercial Bank.

1.4 **The schedule for payments will be based on the Buyers requirements, enumerated at succeeding Paragraphs. The summary of delivery schedule, payments to be made and schedule of submission/release of Advance Bank guarantee (s), as applicable, is specified at Annexure V to Appendix G.**

1.4.1 **Advance Payment**. Fifteen (15) % of the Base Contract Price shall be paid within thirty (30) days of submission of claim and a Bank Guarantee for the equivalent amount and Performance-Cum Warranty Bank Guarantee, subject to correction and acceptability of the documents submitted. The prescribed format of the Advance Payment Bank Guarantee (APBG) is placed at **Annexure II to Appendix G**. The Advance Payment Bank Guarantee (APBG) will deemed to be proportionately and automatically reduced until full extinction along with and prorate to value of each delivery, as evidenced by corresponding copy of document proving delivery and invoices of goods/services supplied/provided. The date of delivery would be reckoned from the date of Signing of Contract (T_0).

1.4.2 **<u>On Dispatch</u>**. Sixty **60** % of the Base Contract price of deliverables and 100% of associated taxes and levies excluding cost of training shall be paid on proof of dispatch of deliverables to the consignee and on production of an inspection note issued by the buyer designated inspection agency on pro rata basis. Number and date of the Railway/Road/Air Transport receipt under which the deliverables charged for in the bill are dispatched by rail/road/Air and the number and date of letter with which such receipt is forwarded to the consignee, should be quoted on the bill. The payment will be made by PCDA/CDA through cheque/Electronic Fund Transfer (EFT) on submission of following documents: -

1.4.2.1 Ink-signed copy of Seller's bill.

1.4.2.2 Ink-signed copy of Commercial invoice.

1.4.2.3 The relevant Transport Receipt.

1.4.2.4 Inspection Acceptance Certificate of Buyer's QA agency demonstrating compliance with the technical specifications of the contract.

1.4.2.5 Packing List.

1.4.2.6 Certificate of Origin.

1.4.2.7 Claim for statutory and other levies to be supported with requisite documents/GST invoice (with QR code, when made applicable)/proof of payment, as applicable.

1.4.2.8 Exemption certificate for taxes/duties, if applicable.

1.4.2.9 Warranty certificate from the SELLER.

1.4.3 In case of failure of the Seller to deliver the deliverables to the Buyer or inordinate delay in the said delivery leading to Termination of the Contract in accordance with Article 22A.1 of SCD, the SELLER will be liable to return payments received against dispatch.

1.4.4 **<u>On Final Acceptance</u>.** The remaining Twenty Five (25) % of the Base Contract Price of deliverables excluding cost of training on pro-rata basis shall be paid within thirty (30) days of submission of documents post completion of JRI, post-delivery and issue of JRI Certificate/ Certified Receipt Voucher (CRV) issued by the Buyer and other relevant documents as mentioned above for final payment, but such payments will be subject to the deductions of such amounts as the Seller may be liable to pay under the agreed terms of the Contract. The concerned PCDA/CDA will release the payment through cheque/EFT.

1.4.5 **<u>Part-Dispatch/Part-Shipment</u>**. Part-dispatch or part-shipment of goods is permitted and corresponding payment will be released to the Seller. However, where permitted, the minimum quantity for using this facility on each occasion will not be less than quantity 100 for Hand Held and Manpack and 50 for Veh based SDR or balance of the lot. Transhipment may not be permitted for certain deliverables and/or under certain situations.

1.4.6 **<u>Payment of Taxes and Duties</u>**. Payment of taxes, duties and statutory levies will be made on submission of requisite documentary proof to Paying authority. Reimbursement of taxes and duties will be as per rates and amounts indicated in the

commercial bid/contract or as per actuals whichever is lower. Custom duty is not reimbursable on input material.

1.4.7 **Exchange Rate Variation**. Exchange Rate variation shall be applicable for Rupee contracts with Indian Vendors, based on RFPs issued under all categories of capital acquisitions mentioned at Para 6 8 to 11 12 of Chapter I of DAP. The indigenous & import components as also the various currencies (of the import components) for ERV purposes, must be determined in advance. The guidelines on protection of Exchange Rate Variation are given at **Annexure I to this Appendix**.

1.4.8 **Payment for Training. 85% payment (including 100% taxes/ levies)** for training, shall be paid on submission of Certificate from Buyers representative that training program has been completed and issued by the Buyer/its representative with requisite documents for payment.

2. **Performance-cum-Warranty Bank Guarantee Clause**. A Performance-cum-Warranty Bank Guarantee (PWBG) of 3 % of value of the Total Contract Price would be furnished by the Bidder in the form of a Bank Guarantee to sequentially act as Performance Bank guarantee till the delivery and as Warranty Bank Guarantee on delivery. The PWBG shall be submitted by the Bidder within one month of signing of contract and shall be valid for a period, until three months beyond the warranty period, as specified in the RFP. If at any stage, the Performance Guarantee is invoked by the Buyer either in full or in part, the Bidder shall make good the shortfall in PWBG within 30 days by an additional Bank Guarantee for equivalent amount. In the event of failure to submit the required Bank Guarantee against invoked Performance Guarantee, equivalent amount will be withheld from the next stage payment till the shortfall in the Bank Guarantee is made good by the Bidder. The prescribed format of the Performance-cum-Warranty Bank Guarantee is placed at **Annexure III to Appendix G**.

3. **Inspection**. Pre Dispatch Inspection (PDI) would be at the discretion of the Buyer. In addition Joint Receipt Inspection (JRI) may also be carried out. If it is PDI, the Bidder should intimate at least 45 days prior to the day when the equipment is to be offered for PDI to enable Buyer's QA personnel to be available for inspection. All the expenses towards PDI will be borne by the Bidder except transportation and accommodation of Buyer's PDI team, which will be deputed at Buyer' expense. In case of rejection of Goods during PDI, re-PDI will be undertaken at Bidder's premises at Buyer's sole discretion. All expenses including transportation and accommodation of Buyer's PDI team will be borne by the Bidder. Towards this, the expenses towards transportation and accommodation of Buyer's PDI team will be initially done by the Buyer and subsequently reimbursed by the Bidder either by remittance or by recovery from the Balance Payment/PWBG. In the event of a failed PDI, the Bidder shall consult the Buyer for rescheduling re-PDI. In case of JRI, the representative of the Seller may be present for inspection after the equipment reaches the concerned destination. The Seller would be informed of the date for JRI.

4. **Liquidated Damages (LD)**. In the event of the Bidder's failure to submit the Bonds, Guarantees and Documents, supply the stores/ goods, perform services, conduct trials, installation of equipment, training and MET as per schedule specified in this contract, the BUYER may, at his discretion withhold cost of the specific lot/batch or 1% of the Project cost, whichever is higher, until the completion of the contract. The BUYER may also deduct from the SELLER as agreed, liquidated damages to the sum of 1.5% for every week of delay or part of a week, subject to the maximum value of the Liquidated Damages being not higher than **15%** of the contract price of the value of delayed stores/ services (Any extension given by the Buyer for delay attributable to Buyer or Force Majeure Clause to be factored in delivery period).

5. **Denial Clause**. In case the delay in delivery is attributable to the Seller or a non-force majeure event, the Buyer may protect himself against extra expenditure during the extended period

by stipulating a denial clause (over and above levy of LD) in the letter informing the Seller of extension of the delivery period. In the denial clause, any increase in statutory duties and/or upward rise in prices due to the Price Variation Clause (PVC) and/or any adverse fluctuation in foreign exchange are to be borne by the Seller during the extended delivery period, while the Buyer reserves his right to get any benefit of downward revisions in statutory duties, PVC and foreign exchange rate. Thus, PVC, other variations and foreign exchange clauses operate only during the original delivery period. The format for extension of delivery period/performance notice under the Denial clause is at **Annexure IV to Appendix G**.

Annexure I to Appendix G
(Refers to Para 1.4.7 of Appendix **G**)

GUIDELINES OF PROTECTION OF EXCHANGE RATE VARIATION IN CONTRACTS

1. Parameters to be kept in view while formulation ERV Clause.

(a) In contracts with Indian Vendors in all categories of capital acquisitions where there is an import content, ERV clause will be provided. However, ERV clause shall not be applicable to contracts in following conditions:-

(i) The delivery period is less than one year; or

(ii) The rate of exchange variation is within the band of +/- 2.5%.

(b) ERV clause will be framed according to the specific requirements of the contract. While calling for information at the RFP stage/formulation of ERV clauses in the contracts, the following factors are to be taken into consideration depending upon the requirements of the individual contracts:-

(i) Year wise and major currency wise import break up is to be indicated.

(ii) Detailed time schedule for procurement of imported material/Services and their value at the FE rates adopted for the contract is to be furnished by the vendor as per the format given below:-

Year	Total cost of imported material/ services (in rupees)	Fe content-out flow (Equivalent in Rupees ₹ in Crore)			
		Dollar Denominated	Euro Denominated	Pounds Denominated	Other Currencies Denominated (as applicable)

(iii) ERV clause will not be applicable in case delivery periods for imported content are subsequently to be refixed/extended unless the reasons for delivery period extension are attributable to the buyer.

(iv) For purposes of ensuring uniformity, the Base Exchange Rate on the ERV reckoning date will be adopted for each of the major foreign currencies. The Base Exchange Rate will be the BC Selling Rate of the Parliament Street Branch of State Bank of India, New Delhi. The ERV reckoning date will be the last date of submission of commercial bids as per RFP. In cases where Option Clause is exercised, the date of reckoning of ERV will be the last date of submission of bids for the RFP of the Original Procurement Case.

(v) ERV clause in the contract is to clearly indicate that ERV is payable/ refundable depending upon exchange rate as prevalent on the date of transaction with reference to Base Exchange Rate on the ERV reckoning date.

(vi) Other issues which are peculiar to the contract.

2. **Methodology For Claiming ERV**. "The prices finalised in the contract are based on the base exchange rates indicated in the contract. The year-wise amount of foreign exchange component of the imported items as indicated in the contract shall be adjusted for the impact of exchange Rate Variation of the Rupee based on the exchange rate prevailing on the date of each transaction, as notified by the SBI, Parliament Street Branch, New Delhi. The impact of notified Exchange Rate Variation shall be computed on an yearly basis for the outflow as tabulated in Annexure….. (The table at Para 1(b) (ii) is to be an Annexure to the contract) and shall be paid/refunded before the end of the financial year based on the certification of Finance Head of the concerned Division…..".

3. Paying authority is to undertake a pre-audit of the documents before payment.

4. Documentation for Claiming ERV. The following documents would need to be submitted in support of the claim on account of ERV:-

(a) A bill of ERV claim enclosing worksheet.

(b) Banker's Certificate/debit advice detailing Foreign Exchange paid and Exchange rate as on date of transaction.

(c) Copies of import orders placed on the suppliers.

(d) Invoice of supplier for the relevant import orders.

****

Annexure II to Appendix G
(Refers to Para 1.4.1 of Appendix **G**)

BANK GUARANTEE FORMAT FOR ADVANCE

To

The _____
Ministry of _____
Government of India
_____ (complete postal address of the beneficiary)

1. "Whereas President of India represented by the _____Ministry of _____ Government of India (hereinafter referred to as BUYER) have entered into a Contract No. _____ (No. of Contract), dated _____ (Date of Contract) with M/s _____ (Name of SELLER) (referred to as SELLER) and whereas according to the said Contract the BUYER has undertaken to make an advance payment of Rs/ US $/Euro/PS £/Yen/AUD/SGD _____ being payment of _____% of the total value of Rs/ US $/Euro/PS £/Yen/AUD/SGD _____ of the said Contract, against issuance of an advance guarantee by a bank."

2. We _____ (indicate the name of the bank) do hereby undertake to pay the amounts due and payable under this guarantee without any demur, merely on a demand from the BUYER intimating that the SELLER is in breach of the Contractual obligations stipulated in the said Contract. Any such demand made on the bank shall be conclusive as regards the amount due and payable by the Bank under this guarantee. However, our total liability under this guarantee shall be restricted to an amount not exceeding Rs/ US $/Euro/PS £/Yen/AUD/SGD _____.

3. We undertake to pay to the BUYER any money so demanded notwithstanding any dispute or disputes raised by the SELLER in any suit or proceedings pending before any Court or Tribunal relating thereto our liability under this present being absolute and unequivocal. The payment so made by us under this bond shall be valid discharge of our liability for payment there under and the SELLER shall have no claim against us for making such payment.

4. We, further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said Contract and that it shall continue to be enforceable till all the dues of the BUYER under or by virtue of the said Contract have been fully paid and its claims satisfied or discharged or till _____ office / Department / Ministry of _____ certifies that the terms and conditions of the said Contract have been fully and properly carried out by the said SELLER and accordingly discharges this guarantee.

5. We, further agree with the BUYER that the BUYER shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said Contract or to extend time of performance by the said SELLER from time to time or to postpone for any time or from time to time any of the powers exercisable by the BUYER against the said SELLER and to forbear or enforce any of the terms and conditions relating to the said Contract and we shall not be relieved from our liability by reason of any such variation, Amendment issued vide MoD ID No. 4(50)/D(Acq)/08 dated 20.06.2016 or extension being granted to the said SELLER or for any forbearance, act or omission on the part of the BUYER or indulgence

by the BUYER to the said SELLER or by any such matter or thing whatsoever which under law relating to sureties would, but for this provision, have effect of so relieving us.

6. The amount of this guarantee will be progressively reduced by (percentage of advance) _____ of total value of each part shipment/services against the stage payment released by the BUYER for that shipment/services made by the SELLER and presentation to us of the payment documents.

7. This guarantee will not be discharged due to the change in the constitution of the bank or the BUYER/SELLER.

8. We, undertake not to revoke this guarantee during the currency except with the previous consent of the BUYER in writing.

9. Notwithstanding anything contained herein above:-

(a) Our liability under this Guarantee shall not exceed Rs/ US $/Euro/PS £/Yen/AUD/SGD _____ (in words)_____

(b) This Bank Guarantee shall remain valid until _____ (hereinafter the expiry date of this guarantee) the Bank Guarantee will cease to be valid after _____ irrespective whether the Original Guarantee is returned to us or not.

(c) We are liable to pay guaranteed amount or any part thereof under this Bank Guarantee only and only if you serve upon us a written demand or a claim in writing on or before _____(Expiry Date).

Dated the _____day of _____ (month and year)

Place :

Signed and delivered by _____ (Name of the bank)

Through its authorised signatory

(Signature with seal)

****

Annexure III to Appendix G
(Refers to Para 2 of Appendix G)

BANK GUARANTEE FORMAT FOR PERFORMANCE-CUM-WARRANTY

To

The _____
Ministry of _____
Government of India
_____ (complete postal address of the beneficiary)

Dear Sir,

1. Whereas President of India represented by the _____ Ministry of _____, Government of India (hereinafter referred to as BUYER) have entered into a Contract No. _____dated _____ (hereinafter referred to as the said Contract) with M/s. _____ (hereinafter referred to as the SELLER) for supply of goods as per Contract to the said BUYER and whereas the SELLER has undertaken to produce a bank guarantee amounting to Rs/ US $/Euro/PS £/Yen/AUD/SGD _____ which is 3% of the Total Contract Price (including taxes and duties) to cover 3% of Total Contract Price (including taxes and duties) each for Performance and Warranty in sequence, to secure its obligations towards Performance-cum-Warranty to the BUYERs.

2. We, the _____ bank hereby expressly, irrevocably and unreservedly undertake the guarantee as principal obligors on behalf the SELLER that, in the event that the BUYER declares to us that the amount claimed is due by way of loss or damage caused to or would be caused or suffered by the BUYER by reason of breach/failure to perform by the said SELLER of any of the terms and conditions in the Contract related to Performance and Warranty clauses, we will pay you, on demand and without demur, all and any sum up to {3% of Total Contract Price (including taxes and duties)} _____ Rupees/ US $/Euro/PS £/Yen/AUD/SGD only at any instance under this Guarantee. Your written demand shall be conclusive evidence to us that such repayment is due under the terms of the said Contract. We shall not be entitled to ask you to establish your claim or claims under this guarantee but will pay the same forthwith without any protest or demur. We undertake to effect payment upon receipt of such written demand.

3. We shall not be discharged or released from the undertaking and guarantee by any arrangements, variations made between you and the SELLER, indulgence to the SELLER by you, or by any alterations in the obligations of the SELLER or by any forbearance whether as to payment, time performance or otherwise.

4. We further agree that any such demand made by the BUYER on the Bank shall be conclusive, binding, absolute and unequivocal notwithstanding any difference or dispute or controversy that may exist or arise between you and the SELLER or any other person.

5. In no case shall the amount of this guarantee be increased.

6. This Performance-cum-Warranty guarantee shall remain valid for a period until three months beyond the warranty period as specified in the Contract i.e. up to _____.

7. Subject to the terms of this Bank Guarantee, the issuing bank hereby irrevocably authorizes the beneficiary to draw the amount of up to Rs/ US $/Euro/PS £/Yen/AUD/SGD _____ {3% of Total Contract Price (including taxes and duties)} for breach/failure to perform by the SELLER of

any of the terms and conditions of the Contract related to performance and warranty clause. Partial drawings and multiple drawings under this Bank Guarantee are allowed within the above stated cumulative amount subject to each such drawing not exceeding 3% of the Total Contract Price (including taxes and duties) (Rs/ US $/Euro/PS £/Yen/AUD/SGD _____ only) (Mention BG amount).

8. This guarantee shall be continuing guarantee and shall not be discharged by any change in the constitution of the Bank or in the constitution of M/s _____. We undertake not to revoke this guarantee during the currency except with previous consent of BUYER in writing.

9. Notwithstanding anything contained herein above:

(a) Our liability under this Guarantee shall not exceed Rs/ US $/Euro/PS £/Yen/AUD/SGD _____ (Rupees _____ only (in words).

(b) This Bank Guarantee shall remain valid until 3 months from the date of expiry of warranty period of the Contract, i.e up to _____ (mention the date) which is 3 months after expiry of the warranty period and the BG shall cease to be valid after _____ irrespective whether the Original Guarantee is returned to us or not.

(c) We are liable to pay guaranteed amount or any part thereof under this Bank Guarantee only and only if you serve upon us a written demand or a claim in writing on or before _____ (Expiry Date).

Dated the _____ day of _____ (month and year)

Place :

Signed and delivered by _____ (name of the bank)

Through its authorised signatory
(Signature with seal)

Annexure IV to Appendix G
(Refers to Para 5 of Appendix G)

FORMAT FOR EXTENSION OF DELIVERY PERIOD/PERFORMANCE NOTICE

Name of the Procuring Entity.....

Extension of Delivery Period/Performance Notice

To
M/s (name and address of firm)

Sub: Contract No..... dated.....for the supply of.....

Ref: Your letter no. ..... dated: .....

Dear Sir,

1. You have failed to deliver {the (fill in qty.) of Stores/the entire quantity of Stores} within the contract delivery period [as last extended up to] (fill in date). In your letter under reply you have asked for [further] extension of time for delivery. In view of the circumstances stated in your said letter, the time for delivery is extended from (fill in date) to (fill in date).

2. Please note that notwithstanding the grant of this extension in terms of Clause (fill in clause number) of the subject contract an amount equivalent to ..... % (..... per cent) of the delivered price of the delayed goods for each week of delay or part thereof (subject to the ceiling as provided in the aforesaid clause) beyond the original contract delivery date/the last unconditionally re-fixed delivery date (as & if applicable), viz., (fill in date) will be recovered from you as liquidated damages. You may now tender the Stores for inspection [balance of the Stores] in terms of this letter. Stores if any already tendered by you for inspection but not inspected will be now inspected accordingly.

3. You are also required to extend the validity period of the performance guarantee for the subject contract from (fill in present validity date) to (fill in required extended date) within15 (fifteen) days of issue of this amendment letter.

4. The above extension of delivery date will also be subject to the following Denial Clause:-

(a) That no increases in price on account of any statutory increase in or fresh Imposition of customs duty, GST or on account of any other taxes/duty, including custom duty), leviable in respect of the Stores specified in the said contract which takes place after (insert the original delivery date) shall be admissible on such of the said Stores, as are delivered after the said date; and,

(b) That notwithstanding any stipulation in the contract for increase in price on any other ground including foreign exchange rate variation, no such increase which takes place after (insert the reckoning date as per DAP 2020) shall be admissible on such of the said Stores as are delivered after the said date.

(c) But nevertheless, the Buyer shall be entitled to the benefit of any decrease in price on account of reduction in or remission of customs duty, GST or on account of any other Tax or

duty or on any other ground as stipulated in the price variation clause or foreign exchange rate variation which takes place after (insert the original delivery date).

5. All other terms and conditions of the contract remain unaltered. This is without any prejudice to Buyer's rights under the terms and conditions of the subject contract.

6. Please intimate your unconditional acceptance of this amendment letter within 10 (ten) days of the issue of this letter failing which the contract will be cancelled at your risk and expense without any further reference to you.

Yours faithfully,
(Authorised Officer)
Duly authorised,
for and on behalf of
The President of India

Note: Select one option within { } brackets; delete portion within [ ] brackets, if not applicable; fill in ( ) brackets. Brackets and this note are not to be typed.

Substitute following first para instead of first para in format above, for issuing a performance notice.

1. You have failed to deliver {the (fill in qty.) of Stores/the entire quantity of Stores} within the contract delivery period [as last extended up to] (fill in date). In spite of the fact that the time of delivery of the goods stipulated in the contract is deemed to be of the essence of the contract, it appears that (fill in the outstanding quantity) are still outstanding even though the date of delivery has expired. Although not bound to do so, the time for delivery is extended from (fill in date) to (fill in date) and you are requested to note that in the event of your failure to deliver the goods within the delivery period as hereby extended, the contract shall be cancelled for the outstanding goods at your risk and cost.

Annexure V to Appendix G
(Refers to Para 9 of RFP and Para 1.4 of App G)

DELIVERY SCHEDULE AND STAGES OF PAYMENT

1. The terms of payment may vary between each project depending upon a variety of factors such as complexity of equipment/system, requirement of validation trials for establishing 'proof of concept', delivery period, integration requirements etc. However, some broad guidelines for payments terms are appended in subsequent Paras.

2. **For Delivery in Lots/ Batches**

Ser No	Activity	Delivery Timelines (T_0 + Months)	Scheme for Payment	Scheme for submission and Return of Advance Payment Bank Guarantees	Remarks
(a)	Signing of contract	T_0	15% of the Base Contract Price	APBG of equivalent amount to be submitted	T_0 is date of Signing of Contract
(b)	**On Dispatch of all equipment/system**				
(i)	Software Defined Radio Sets comprising Hand Held Radio Sets, Manpack Radio Sets and Vehicle Based Radio Sets (Quantity 930)	T_0 to $T_0 + T_{12}$	60 % of Base Contract Price of deliverables and 100% of associated taxes and levies (less cost of training) on Pro-rata Basis and reimbursement of 100% taxes on pro rata basis		**Repository of fresh keys along with Key Generator Software and provisions to load these keys in the SDR will be provided**
(ii)	MRLS				
(iii)	SMT/STE Jigs and Fixtures				
(iv)	Training Aggregates and Training Literature				
(c)	**On Delivery/ Final Acceptance of all equipment/ system**				
(i)	Software Defined Radio Sets comprising Hand Held Radio Sets, Manpack Radio Sets and Vehicle Based Radio Sets (quantity 930)	T_0 to $T_0 + T_{12}$	25% of the Base Contract Price of deliverables excluding cost of training on Pro-rata Basis	APBG is to be returned on pro-rata basis on delivery of each lot/batch. APBG pertaining to documentation and training can be returned on delivery of a particular	**Repository of fresh keys along with Key Generator Software and provisions to load these keys in the SDR will be provided**
(ii)	MRLS				

Ser No	Activity	Delivery Timelines (T_0 + Months)	Scheme for Payment	Scheme for submission and Return of Advance Payment Bank Guarantees	Remarks
(iii)	SMT/STE Jigs and Fixtures			lot/batch.	
(iv)	Training Aggregates and Training Literature				
(d)	Completion of Training	As per Para 14	85% of the cost of Training and Taxes and levies		

Note: -

1. T_o is date of signing of contract

2. Delivery completion includes transportation of supplies by the vendor upto the consignee location and successful JRI. Transportation of equipment by the vendor up to the ultimate consignee Location will be the responsibility of SELLER.

3. Repository of fresh keys along with Key Generation Software and provisions to load these keys in the SDR will be provided with each SDR.

4. "**Engineering Support Package (ESP)**. Delivery of the deliverables pertaining to ESP shall be as under:-

(a) **MRLS.**

(i) MRLS to be delivered on pro rata basis and delivery to be completed by six months before the expiry of warranty period of the lot.

(b) All consumables & spares required for **scheduled maintenance & servicing** of SDR (as per Maintenance Philosophy of vendor) during warranty period will be provided by the bidder during the warranty period.

(c) **SMT/STEs, Technical Literature & Training Aggregate**. The entire quantity to be delivered along with **the first lot of equipment** and prior to the conduct of training by the OEM, whichever is earlier." (instillation of SMT/ STEs)

Appendix H
(Refers to Para 45 and 54 (b) of RFP)

EVALUATION CRITERIA AND PRICE BID FORMAT

1. **Evaluation Criteria**. The guidelines for evaluation of Bids will be as follows:-

1.1. Only those Bids will be evaluated, which are found to be fulfilling all the eligibility and qualifying requirements of the RFP, both technically and commercially. The bidder,

whose price is arrived as lowest as per Evaluation criteria given in this Appendix, will be declared as L-1 bidder by Buyer.

1.2. **In 'Buy (Indian)'**.

1.2.1 **Where DCF Technique as Given in Para 4 is Not Applicable**. L-1 bidder will be determined on the basis of quoted cost of all items including taxes and duties payable to Central/State/Local Governments but with exclusion of BNE items sourced from common single source in accordance with Para 109 of Chapter II of DAP-20. The scope of BNE cost shall include the basic cost of the Main Equipment and OEM Training, Training Aggregates, Documentation, SMT/STE, Freight and OBS as applicable/as indicated in the RFP, which are exclusively sourced from the nominated vendor (OEM). No other cost including the cost of items sourced directly from third parties and the cost of activities jointly undertaken by the Bidder/Bidder's sub vendor and the nominated vendor (OEM) or any third parties are to be included in the BNE cost. BNE rate would also be separately negotiated. However, payment will be made after adding the actual cost of BNE, at the time of purchase from OFB/DPSU/Private vendor, to the L1 cost determined as mentioned above.

1.3. Custom duty on input materials shall not be loaded by the Indian Bidders in their price bids, if they are exempted under the existing Notifications. In such cases, necessary Custom Duty Exemption Certificate (CDEC) shall be issued by the Buyer. In cases where Custom Duty is not exempted, Basic Custom Duty on input material is to be included in the cost of Basic Equipment, Installation/Commissioning/Integration, BNE, ToT, MRLS, SMT, STE, ESP and any other item listed at Column (ii) of Para 2 below.

1.4. If there is a discrepancy between the unit price and the total price that is obtained by multiplying the unit price and quantity, the unit price will prevail and the total price will be corrected based on indicative rates of taxes and duties at columns (vi) and (vii) of Para 2 below. If there is a discrepancy between words and figures, the amount in words will prevail for calculation of price.

2. **Price Bid Format**. The Price Bid Format is given below and Bidders are required to fill this correctly with full details. No column of the Bid format has to be left blank. The clubbing of serials/sub serials to indicate a consolidated cost is not acceptable. Columns of 'quantity', 'unit cost', 'total cost (including all taxes and duties)', 'GST/IGST (%) and Custom Duty (%) are to be filled up with '0', 'positive numerical values' or 'Not Applicable' at every row as applicable. If any column is not applicable and intentionally left blank, the reason for the same has to be clearly indicated in the remarks column.

Ser No	**Items**	**Qty**	**Unit Cost**	**Total Cost (iii) x (iv)**	**Indicative Rate of Taxes & Duties used to arrive at Total Cost (as applicable)**		**Total Cost (including all taxes & duties) (v) + (vi) +(vii)**	**Remarks**
					GST/ IGST (%)	**Custom Duty (%)**		
(i)	**(ii)**	**(iii)**	**(iv)**	**(v)**	**(vi)**	**(vii)**	**(viii)**	**(ix)**
A.	Cost of **Basic Equipment.** Full break-up details shall							

Ser No	Items	Qty	Unit Cost	Total Cost (iii) x (iv)	Indicative Rate of Taxes & Duties used to arrive at Total Cost (as applicable)		Total Cost (including all taxes & duties) (v) + (vi) +(vii)	Remarks
					GST/ IGST (%)	Custom Duty (%)		
(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)	(ix)
	be given.							
B.	Cost of **Installation / Commissioning/ Integration**							
C.	Cost of Interoperable wave form							• **Will be used for L1 determination**
D.	Cost of **Manufacturer's Recommended List of Spares** as per the format given at Annexure I to Appendix E. In case equipment is already in usage, the spare parts requirement must be specific rather than being based on MRLS.							
E.	Cost of **Special Maintenance Tools and Special Test Equipment** as per format given at Annexure II to Appendix E.							
F.	Cost of **Operator's Manual** and **Technical Literature** (in English Language) including Illustrated Spare Parts List as per Annexure III to Appendix E.							
G.	Cost of **Training Aids** such as simulators, cut out models, films, charts etc as recommended by the supplier as per Annexure IV to Appendix E.							

Ser No	Items	Qty	Unit Cost	Total Cost (iii) x (iv)	Indicative Rate of Taxes & Duties used to arrive at Total Cost (as applicable)		Total Cost (including all taxes & duties) (v) + (vi) +(vii)	Remarks
					GST/ IGST (%)	Custom Duty (%)		
(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)	(ix)
H.	Cost of recommended period of **Training** excluding the cost of travel and boarding and lodging.							
J.	**Any other** cost (to be specified).							
K.	**Freight and Transit Insurance** Cost (where applicable).							
L.	**Total Cost** (Total of Serial A to J)						#	# This will be used in determining L1 vendor (duly applying provisions of Para 1 above).
M.	**Foreign Exchange component** of the proposal. (for Indian Vendors only)							
N.	**CDEC (if applicable)**, its authority and amount for which required.							

***Note**: **Taxes and Duties**. All Indirect Taxes and Duties will be paid at actuals or as indicated in the Commercial bid by the Bidder, whichever is lower. In case of any change in the tax structure/rates by BUYER's Government, only incremental/decremented change will be paid.*

Appendix J
(Refers to Para 19 and 50 of RFP)

STANDARD CONDITIONS OF RFP

LAW

1. The present Contract shall be considered and made in accordance to the laws of Republic of India.

ARBITRATION

2.1 All disputes or differences arising out of or in connection with the present Contract, including the one connected with the validity of the present Contract or any part thereof, shall be settled by bilateral discussions.

2.2 Any dispute, disagreement of question arising out of or relating to this Contract or relating to construction or performance (except as to any matter the decision or determination whereof is provided for by these conditions), which cannot be settled amicably, shall within sixty (60) days or such longer period as may be mutually agreed upon, from the date on which either party informs the other in writing by a notice that such dispute, disagreement or question exists, will be referred to the Arbitration Tribunal consisting of three arbitrators.

2.3 Within sixty (60) days of the receipt of the said Notice, one arbitrator shall be nominated in writing by SELLER and one arbitrator shall be nominated by BUYER.

2.4 The third arbitrator, shall be nominated by the parties within ninety (90) days of the receipt of the notice mentioned above, failing which the third arbitrator may be nominated under the provision of Indian Arbitration and Conciliation Act, 1996 (as amended from time to time) or by dispute resolution institutions like Indian Council of Arbitration or ICADR, at the request of either party, but the said nomination would be after consultation with both the parties. The arbitrator nominated under this Clause shall not be regarded nor act as an umpire.

2.5 The Arbitration Tribunal shall have its seat in New Delhi or such other place in India as may be decided by the arbitrator.

2.6 The Arbitration Proceedings shall be conducted in India under the Indian Arbitration and Conciliation Act, 1996 (as amended from time to time) and the award of such Arbitration Tribunal shall be enforceable in Indian Courts only.

2.7 The decision of the majority of the arbitrators shall be final and binding on the parties to this contract.

2.8 Each party shall bear its own cost of preparing and presenting its case. The cost of arbitration including the fees and expenses of the third arbitrator shall be shared equally by the SELLER and the BUYER.

2.9 In the event of a vacancy caused in the office of the arbitrators, the party which nominated such arbitrator, shall be entitled to nominate another in his place and the arbitration proceedings shall continue from the stage they were left by the retiring arbitrator.

2.10 In the event of one of the parties failing to nominate its arbitrator within sixty (60) days

as above or if any of the parties does not nominate another arbitrator within sixty (60) days of the place of arbitrator falling vacant, then the other party shall be entitled after due notice of at least thirty (30) days to request dispute resolution institutions in India like Indian Council of Arbitration and ICADR to nominate another arbitrator as above.

2.11 If the place of the third arbitrator falls vacant, his substitute shall be nominated according to the provisions herein above stipulated.

2.12 The parties shall continue to perform their respective obligations under this contract during the pendency of the arbitration proceedings except in so far as such obligations are the subject matter of the said arbitration proceedings.

FORCE MAJEURE

3.1 Should any force majeure circumstances arise, each of the contracting party shall be excused for the non-fulfilment or for the delayed fulfilment of any of its contractual obligations, if the affected party within (30 days) of its occurrence informs in a written form the other party.

3.2 Force majeure shall mean fires, floods, natural disasters or other acts such as war, turmoil, strikes, sabotage, explosions, beyond the control of either party.

3.3 Provided the acts of The Government or any state parties of the seller which may affect the discharge of the Seller's obligation under the contract shall not be treated as Force Majeure.

PENALTY FOR USE OF UNDUE INFLUENCE

4.1 The Seller undertakes that he has not given, offered or promised to give, directly or indirectly any gift, consideration, reward, commission, fees brokerage or inducement to any person in service of the Buyer or otherwise in procuring the Contracts or forbearing to do or for having done or for borne to do any act in relation to the obtaining or execution of the Contract or any other Contract with the Government for showing or forbearing to show favour or disfavour to any person in relation to the Contract or any other Contract with the Government. Any breach of the aforesaid undertaking by the seller or any one employed by him or acting on his behalf (whether with or without the knowledge of the seller) or the commission of any offence by the seller or anyone employed by him or acting on his behalf, as defined in Chapter IX of the Indian Penal Code, 1860 or the Prevention of Corruption Act, 1988 or any other Act enacted for the prevention of corruption shall entitle the Buyer to cancel the contract and all or any other contracts with the seller and recover from the seller the amount of any loss arising from such cancellation. A decision of the buyer or his nominee to the effect that a breach of the undertaking had been committed shall be final and binding on the Seller.

4.2 Giving or offering of any gift, bribe or inducement or any attempt at any such act on behalf of the seller towards any officer/employee of the buyer or to any other person in a position to influence any officer/employee of the Buyer for showing any favour in relation to this or any other contract, shall render the Seller to such liability/penalty as the Buyer may deem proper, including but not limited to termination of the contract, imposition of penal damages, forfeiture of the Bank Guarantee and refund of the amounts paid by the Buyer.

INTEGRITY PACT

5.1 Further signing of an 'Integrity Pact' would be considered between government department and the bidder for schemes exceeding ₹ **20 Crores**. The Integrity Pact is a binding agreement between the agency and bidders for specific contracts in which the agency promises that it will not accept bribes during the procurement process and bidders promise that they will not offer bribes. Under the IP, the bidders for specific services or contracts agree with the procurement agency or office to carry out the procurement in a specified manner. The essential elements of the IP are as follows:-

(a) A pact (contract) between the Government of India (Ministry of Defence) (the authority or the "principal") and those companies submitting a tender for this specific activity (the "bidders");

(b) An undertaking by the principal that its officials will not demand or accept any bribes, gifts, etc., with appropriate disciplinary or criminal sanctions in case of violation;

(c) A statement by each bidder that it has not paid and will not pay, any bribes;

(d) An undertaking by each bidder that he shall not pay any amount as gift, reward, fees, commission or consideration to such person, party, firm or institution (including Agents and other as well as family members, etc., of officials), directly or indirectly, in connection with the contract in question. All payments made to the Agent 12 months prior to tender submission would be disclosed at the time of tender submission and thereafter an annual report of payments would be submitted during the procurement process or upon demand of the MoD.

(e) The explicit acceptance by each bidder that the no-bribery commitment and the disclosure obligation as well as the attendant sanctions remain in force for the winning bidder until the contract has been fully executed;

(f) Undertakings on behalf of a bidding company will be made "in the name and on behalf of the company's chief executive officer";

(g) The following set of sanctions shall be enforced for any violation by a bidder of its commitments or undertakings:

(i) Denial or loss of contract;

(ii) Forfeiture of the and Guarantee for Performance-cum-Warranty Bond (after signing of contract).

(iii) Payment to the Buyer of any such amount paid as gift, reward, fees or consideration along with interest at the rate of 2% per annum above LIBOR rate.

(iv) Refund of all sums already paid by the Buyer along with interest at the rate of 2% per annum above LIBOR rate.

(v) Recovery of such amount, referred to in (iii) and (iv) above, from other contracts of the Seller with the Government of India.

(vi) At the discretion of the Buyer, the Seller shall be liable for action as per extant policy on Putting on Hold, Suspension and Debarment of Entities.

(h) Bidders are also advised to have a company code of conduct (clearly rejecting the use of bribes and other unethical behaviour) and a compliance program for the implementation of the code of conduct throughout the company.

(j) The draft Pre-Contract Integrity Pact is attached as **Annexure I to this Appendix.** The vendors are required to sign them and submit separately along with the technical and commercial offers.

5.2 In respect of bids from DPSUs, the concerned DPSU shall enter in to a Pre-Contract Integrity Pact, on the same lines with their sub-vendors individually, in case the estimated value of each sub-contract(s) exceed ₹ 20 Crore and such subcontract(s) are required to be entered in to by the DPSU with a view to enable DPSU to discharge the obligations arising out of their bid in question in response to this RFP.

AGENTS

6. The Seller confirms and declares to the Buyer that the Seller is the original manufacturer of the stores referred to in this contract. The Seller confirms that he has not engaged any person, party, firm or institution as an Agent including his Agents already intimated to MoD; to, influence, manipulate or in any way to recommend to any functionaries of the Government of India, whether officially or unofficially, to the award of the contract to the Seller, or to indulge in corrupt and unethical practices. The Seller has neither paid, promised nor has the intention to pay to any person, party, firm or institution in respect of any such intervention or manipulation. The Seller agrees that if it is established at any time to the satisfaction of the buyer that the present declaration is in any way incorrect or if at a later stage it is discovered by the Buyer that Seller has engaged any such person, party, firm or institution and paid, promised or has intention to pay any amount, gift, reward, fees, commission or consideration to such person, party, firm or institution, whether before or after the signing of this contract, the Seller will be liable for any or all of the following actions:-

(a) To pay to the Buyer any such amount paid as gift, reward, fees or consideration along with interest at the rate of 2% per annum above LIBOR rate.

(b) The Buyer will also have a right to put on hold or cancel the Contract either wholly or in part, without any entitlement or compensation to the Seller who shall in such event be liable to refund all payments made by the Buyer in terms of the Contract along with interest at the rate of 2% per annum above LIBOR rate

(c) The Buyer will also have the right to recover any such amount referred in (a) and (b) above from other contracts of the Seller with the Government of India.

(d) At the discretion of the Buyer, the Seller shall be liable for action as per extant policy on Putting on Hold, Suspension and Debarment of Entities

7. In case it is found to the satisfaction of the BUYER that the SELLER has engaged an Agent, or paid commission or influenced any person to obtain the contract as described in clauses relating to Agents and clauses relating to Penalty for Use of Undue Influence, the SELLER, on demand of the BUYER shall provide necessary information/inspection of the relevant financial documents/ information, including a copy of the contract(s) and details of payment terms between the vendors and Agents engaged by him.

TERMINATION OF CONTRACT

8. **Termination Clause**. The contract may be terminated by the Buyer in the following cases :-

(a) The delivery of the material is delayed for causes not attributable to Force Majeure for more than Six months after the scheduled date of delivery.

(b) The Seller is declared bankrupt or becomes insolvent.

(c) The 'Buyer' has noticed that the seller has utilised the services of an Agent in getting this contract and paid any commission to such individual / company etc.

****

Annexure I to Appendix J
(Refers to Para 5.1 (j) of Appendix J)

PRE-CONTRACT INTEGRITY PACT

General

1. Whereas the PRESIDENT OF INDIA, represented by Joint Secretary & Acquisition Manager (Army/Air Force/Maritime & Systems)/Major General & equivalent, Service Headquarters./Coast Guard, Ministry of Defence, Government of India, hereinafter referred to as the Buyer and the first party, proposes to procure (Name of the Equipment), hereinafter referred to as Defence Stores and M/s ___ _____ represented by,_____ Chief Executive Officer (which term, unless expressly indicated by the contract, shall be deemed to include its successors and its assignees), hereinafter referred to as the Bidder/Seller and the second party, is willing to offer/has offered the Defence stores.

2. Whereas the Bidder is a private company/public company/partnership/registered export agency, constituted in accordance with the relevant law in the matter and the Buyer is a Ministry of the Government of India performing its functions on behalf of the President of India.

Objectives

3. Now, therefore, the Buyer and the Bidder agree to enter into this pre-contract agreement, hereinafter referred to as Integrity Pact, to avoid all forms of corruption by following a system that is fair, transparent and free from any influence/unprejudiced dealings prior to, during and subsequent to the currency of the contract to be entered into with a view to:

3.1 Enabling the Buyer to obtain the desired defence stores at a competitive price in conformity with the defined specifications of the Services by avoiding the high cost and the distortionary impact of corruption on public procurement

3.2 Enabling Bidders to abstain from bribing or any corrupt practice in order to secure the contract by providing assurance to them that their competitors will also refrain from bribing and other corrupt practices and the Buyer will commit to prevent corruption, in any form, by their officials by following transparent procedures.

Commitments of the Buyer

4. The Buyer commits itself to the following:-

4.1 The Buyer undertakes that, no official of the Buyer, connected directly or indirectly with the contract will demand, take a promise for or accept, directly or through intermediaries, any bribe, consideration, gift, reward, favour or any material or immaterial benefit or any other advantage from the Bidder**,** either for themselves or for any person, organisation or third party related to the contract in exchange for an advantage in the bidding process, bid evaluation, contracting or implementation process related to the Contract.

4.2 The Buyer will, during the pre-contract stage, treat all Bidders alike and will provide to all Bidders the same information and will not provide any such information to any particular Bidder which could afford an advantage to that particular Bidder in comparison to other Bidders.

4.3 All the officials of the Buyer will report to the appropriate Government office any attempted or completed breaches of the above commitments as well as any substantial suspicion of such a breach.

5. In case of any such preceding misconduct on the part of such official(s) is reported by the Bidder to the Buyer with full and verifiable facts and the same is prima facie found to be correct by the Buyer, necessary disciplinary proceedings, or any other action as deemed fit, including criminal proceedings may be initiated by the Buyer and such a person shall be debarred from further dealings related to the contract process. In such a case while an enquiry is being conducted by the Buyer the proceedings under the contract would not be stalled.

Commitments of Bidders

6. The Bidder commits himself to take all measures necessary to prevent corrupt practices, unfair means and illegal activities during any stage of his bid or during any pre-contract or post-contract stage in order to secure the contract or in furtherance to secure it and in particular commits himself to the following:

6.1 The Bidder will not to offer, directly or through intermediaries, any bribe, gift, consideration, reward, favour, any material or immaterial benefit or other advantage, commission, fees, brokerage or inducement to any official of the Buyer, connected directly or indirectly with the bidding process, or to any person, organisation or third party related to the contract in exchange for any advantage in the bidding, evaluation, contracting and implementation of the Contract.

6.2 The Bidder further undertakes that he has not given, offered or promised to give, directly or indirectly any bribe, gift, consideration, reward, favour, any material or immaterial benefit or other advantage, commission, fees, brokerage or inducement to any official of the Buyer or otherwise in procuring the Contract or forbearing to do or having done any act in relation to the obtaining or execution of the Contract or any other Contract with the Government for showing or forbearing to show favour or disfavour to any person in relation to the Contract or any other Contract with the Government.

6.3 The Bidder will not collude with other parties interested in the contract to impair the transparency, fairness and progress of the bidding process, bid evaluation, contracting and implementation of the contract.

6.4 The Bidder will not accept any advantage in exchange for any corrupt practice, unfair means and illegal activities.

6.5 The Bidder further confirms and declares to the Buyer that the Bidder is the original manufacturer/integrator/authorised government sponsored export entity of the Defence stores and has not engaged any individual or firm or company whether Indian or foreign to intercede, facilitate or in any way to recommend to the Buyer or any of its functionaries, whether officially or unofficially to the award of the contract to the Bidder, nor has any amount been paid, promised or intended to be paid to any such individual, firm or company or Agent in respect of any such intercession, facilitation or recommendation.

6.6 The bidder would not enter into conditional contract with any Agents, brokers or any other intermediaries wherein payment is made or penalty is levied, directly or indirectly, on success or failure of the award of the contract. The bidder while presenting the bid, shall disclose any payments he has made during the 12 months prior to tender submission or is

committed to or intends to make to officials of the buyer or their family members, Agents, brokers or any other intermediaries in connection with the contract and the details of such services agreed upon for such payments. Within the validity of PCIP, bidder shall disclose to MoD any payments made or has the intention to pay any amount, gift, reward, fees, commission or consideration to such person, party, firm or institution as an annual report during the procurement process.

6.7 The Bidder shall not use improperly, for purposes of competition or personal gain or pass on to others, any information provided by the Buyer as part of the business relationship regarding plans, technical proposals and business details, including information contained in any electronic data carrier. The Bidder also undertakes to exercise due and adequate care lest any such information is divulged.

6.8 The Bidder commits to refrain from giving any complaint directly or through any other manner without supporting it with full and verifiable facts. Complaint will be processed as per **Guidelines for Handling of Complaints** in vogue. In case the complaint is found to be vexatious, frivolous or malicious in nature, it would be construed as a violation of Integrity Pact.

6.9 The Bidder shall not instigate or cause to instigate any third person to commit any of the actions mentioned above.

7. **Previous Transgression**

7.1 The Bidder declares that no previous transgression occurred in the last three years immediately before signing of this Integrity Pact, with any other company in any country in respect of any corrupt practices envisaged hereunder or with any Public Sector Enterprise in India or any Government Department in India.

7.2 If the Bidder makes incorrect statement on this subject, Bidder can be disqualified from the tender process or the contract and if already awarded, can be terminated for such reason.

8. **Bid Security: Earnest Money Deposit**

8.1 Every bidder, while submitting commercial bid, shall submit Bid Security in the form of Earnest Money Deposit (EMD), in cases where applicable (as provided in Clause 8 herein).

(a) To safeguard against a bidder(s) withdrawing or altering its bid during the bid validity period, Bid Security (also known as EMD) is to be obtained from all bidders except for cases upto Rs. 100 Crores (i.e, all cases upto Rs. 100 crores of AoN will be exempted from payment of EMD) as follows:-

EMD TABLE

Estimated Cost of Procurement Scheme(Crore)		**EMD Amount**
Above (Not including)	**To (Including)**	
-	100	Nil
100	150	30 Lakh
150	300	70 Lakh
300	1000	2 Crore

1000	2000	5 Crore
2000	3000	10 Crore
3000	5000	15 Crore
5000	-	25 Crore

(b) EMD is not required from Micro and Small Enterprises (MSEs) as defined in MSE Procurement Policy issued by Department of Micro, Small and Medium Enterprises (MSME) or are registered with the Central Purchase Organisation or the concerned Ministry or Department or Startups as recognised by Department of Industrial Policy & Promotion (DIPP), in accordance with the Ministry of Finance office memorandum bearing No. No. F.20/2/2014-PPD (Pt.) dated July 25, 2017 (as amended from time to time).

(c) DPSUs are not required to submit EMD when nominated as ab-initio single vendor. DPSUs will submit all BGs and EMD as applicable while participating in multi vendor cases with private vendors.

(d) Format of EMD. The Bid Security may be accepted in the following forms, safeguarding the Buyer's interest in all respect:-

(i) Bank Guarantee from any Indian Public or Private Scheduled Commercial Bank notified by RBI or first-class banks of international repute. The format of the Bank Guarantee for Bid Security is provided at **Annexure 1** to **Appendix J**.

(ii) Insurance Surety Bond - The format and guidelines pertaining to the same shall be issued / notified by the Ministry of Defence.

(iii) Account Payee Demand Draft, Fixed Deposit Receipt, Banker's Cheque shall be payable in an acceptable form. The Beneficiary Bank Details for furnishing the same are as follows:

(IFSC Code - SBIN0000691)
State Bank of India New Delhi Main Branch
C Block, 11 Parliament Street
New Delhi, Pin: 110001

(e) Validity of EMD. The EMD will be valid for eighteen months or till signing of contract, whichever is later. The EMD shall be extended from time to time as required by the Buyer and agreed by the Bidder. No interest shall be payable by the Buyer to the Bidder(s) on the EMD for the period of its currency. For unsuccessful bidders EMD will be returned on declaration of successful bidder(s).

(f) Instances of Forfeiture of EMD.

(i) If the Bidder withdraws or amends, impairs or derogates from the Bid in any respect within the period of validity of this tender.

(ii) If the Bidder having been notified of the acceptance of his tender by the Buyer during the period of its validity.

(aa) If the Bidder fails to furnish the Performance Security for the due

performance of the contract.
(ab) Fails or refuses to accept/ execute the contract.

(iii) In case of violation of Pre-Contract Integrity Pact, EMD will be forfeited besides other legal penalties as may be decided by the Ministry of Defence.

8.2 In the case of successful bidder a clause would also be incorporated in the Article pertaining to Performance-cum-Warranty Bond in the Purchase Contract that the provisions of Sanctions for Violation shall be applicable for forfeiture of Performance Bond in case of a decision by the Buyer to forfeit the same without assigning any reason for imposing sanction for violation of this pact.

8.3 The provisions regarding Sanctions for Violation in Integrity Pact include forfeiture of Performance-cum-Warranty Bond in case of a decision by the Buyer to forfeit the same without assigning any reason for imposing sanction for violation of Integrity Pact.

8.4 No interest shall be payable by the Buyer to the Bidder(s) on EMD for the period of its currency.

9. **Company Code of Conduct**

9.1 Bidders are also advised to have a company code of conduct (clearly rejecting the use of bribes and other unethical behaviour) and a compliance program for the implementation of the code of conduct throughout the company.

10. **Sanctions for Violation**

10.1 Any breach of the aforesaid provisions by the Bidder or any one employed by him or acting on his behalf (whether with or without the knowledge of the Bidder) or the commission of any offence by the Bidder or any one employed by him or acting on his behalf, as defined in Chapter IX of the Indian Penal Code, 1860 or the Prevention of Corruption Act 1988 or any other act enacted for the prevention of corruption shall entitle the Buyer to take all or any one of the following actions, wherever required:

(i) To immediately call off the pre-contract negotiations without assigning any reason or giving any compensation to the Bidder. However, the proceedings with the other Bidder(s) would continue.

(ii) Performance-cum-Warranty Bond post signing of contract shall stand forfeited either fully or partially, as decided by the Buyer and the Buyer shall not be required to assign any reason therefore.

(iii) To immediately cancel the contract, if already signed, without any compensation to the Bidder.

(iv) To recover all sums already paid by the Buyer, in case of an Indian Bidder with interest thereon at 2% higher than the prevailing Base Rate of SBI and in case of a Bidder from a country other than India with interest thereon at 2% higher than the LIBOR. If any outstanding payment is due to the Bidder from the Buyer in connection with any other contract for any other defence stores, such outstanding payment could also be utilised to recover the aforesaid sum and interest.

(v) To encash the advance bank guarantee and Performance-cum-Warranty Bond if furnished by the Bidder, in order to recover the payments, already made by the Buyer, along with interest.

(vi) To cancel all or any other Contracts with the Bidder.

(vii) To Put on Hold or Suspend or Debar the bidder as per the extant policy.

(viii) To recover all sums paid in violation of this Pact by Bidder(s) to any Agent or broker with a view to securing the contract.

(ix) If the Bidder or any employee of the Bidder or any person acting on behalf of the Bidder, either directly or indirectly, is closely related to any of the officers of the Buyer, or alternatively, if any close relative of an officer of the Buyer has financial interest/stake in the Bidder's firm, the same shall be disclosed by the Bidder at the time of filing of tender. Any failure to disclose the interest involved shall entitle the Buyer to debar the Bidder from the bid process or rescind the contract without payment of any compensation to the Bidder. The term '**close relative**' for this purpose would mean spouse whether residing with the Government servant or not, but not include a spouse separated from the Government servant by a decree or order of a competent court; son or daughter or step son or step daughter and wholly dependent upon Government servant, but does not include a child or step child who is no longer in any way dependent upon the Government servant or of whose custody the Government servant has been deprived of by or under any law; any other person related, whether by blood or marriage, to the Government servant or to the Government servant's wife or husband and wholly dependent upon Government servant.

(x) The Bidder shall not lend to or borrow any money from or enter into any monetary dealings or transactions, directly or indirectly, with any employee of the Buyer and if he does so, the Buyer shall be entitled forthwith to rescind the contract and all other contracts with the Bidder. The Bidder shall be liable to pay compensation for any loss or damage to the Buyer resulting from such rescission and the Buyer shall be entitled to deduct the amount so payable from the money(s) due to the Bidder.

(xi) In cases where irrevocable Letters of Credit have been received in respect of any contract signed by the Buyer with the Bidder, the same shall not be opened.

10.2 The decision of the Buyer to the effect that a breach of the provisions of this Integrity Pact has been committed by the Bidder shall be final and binding on the Bidder, however, the Bidder can approach the Independent Monitor(s) appointed for the purposes of this Pact.

11. **Fall Clause**

11.1 The Bidder undertakes that he has not supplied/is not supplying the similar products, systems or subsystems at a price lower than that offered in the present bid in respect of any other Ministry/Department of the Government of India and if it is found at any stage that the similar system or sub-system was supplied by the Bidder to any other Ministry/Department of the Government of India at a lower price, then that very price, with due allowance for elapsed time, will be applicable to the present case and the difference in the cost would be refunded by the Bidder to the Buyer, even if the contract has already been concluded.

11.2 The Bidder shall strive to accord the most favoured customer treatment to the Buyer

in respect of all matters pertaining to the present case.

12. **Independent Monitors**

12.1 The Buyer has appointed Independent Monitors for this Pact in consultation with the Central Vigilance Commission. The names and addresses of nominated Independent Monitors (at the time of issue of RFP) are as follows (however the vendor must refer to the MoD website at www.mod.nic.in to check for changes to these details): -

(a) Shri Ravikant, IAS/ Bihar (1984) (Retd),
Apartment No 502, Tower-1, M3M Merlin,
Sector - 67, Gurugram-122001 (Haryana)
Mob: 9953555566
Email – 84ravikant@gmail.com

(b) Dr. Prabhat Kumar, IAS/ UP (1985) (Retd),
C-120, Sector-39, Noida-201301,
Gautam Budh Nagar (Uttar Pradesh)
Mob : 9810530048
Email – prabhatfamily@gmail.com

(c) Shri Chet Ram, IRS (1985) (Retd),
Flat No. A-203, Building Gemini, Gladys Alwares Marg,
Hiranandani Meadows, Off-Pokhran Road No 2,
Thane (W), Maharashtra-400610
Mob : 9869479987
Email – cr_koli@yahoo.com

12.1A All communications to Independent Monitors will be copied to Director (Vigilance). The Designation and Contact details of Director (Vigilance) are as follows:-

Director (Vigilance)
Room No 316,
B Wing, Sena Bhawan
New Delhi 110011
Tele No – 011-23012304

12.2 After the Integrity Pact is signed, the Buyer shall provide a copy thereof, along with a brief background of the case to the Independent Monitors, if required by them.

12.3 The Bidder(s), if they deem it necessary, may furnish any information as relevant to their bid to the Independent Monitors.

12.4 If any complaint with regard to violation of the IP is received by the buyer in a procurement case, the buyer shall refer the complaint to the Independent Monitors for their comments/enquiry.

12.5 If the Independent Monitors need to peruse the relevant records of the Buyer in connection with the complaint sent to them by the Buyer, the Buyer shall make arrangement for such perusal of records by the Independent Monitors.

12.6 The report of enquiry, if any, made by the Independent Monitors shall be submitted to the head of the Acquisition Wing of the Ministry of Defence, Government of India for a final and appropriate decision in the matter keeping in view the provision of this Pact.

13. **Examination of Books of Accounts**

In case of any allegation of violation of any provisions of this Integrity Pact or payment of commission, the Buyer or its agencies shall be entitled to examine the Books of Accounts of the Bidder and the Bidder shall provide necessary information of the relevant financial documents in English and shall extend all possible help for the purpose of such examination.

14. **Law and Place of Jurisdiction**

This Pact is subject to Indian Law. The place of performance and jurisdiction is the seat of the Buyer i.e. New Delhi.

15. **Other Legal Actions**

The actions stipulated in this Integrity Pact are without prejudice to any other legal action that may follow in accordance with the provisions of the extant law in force relating to any civil or criminal proceedings.

16. **Validity**

16.1 The validity of this Integrity Pact shall be from date of its signing and extend up to 5 years or the complete execution of the contract to the satisfaction of both the Buyer and the Bidder/Seller, whichever is later.

16.2 Should one or several provisions of this Pact turn out to be invalid; the remainder of this Pact remains valid. In this case, the parties will strive to come to an agreement to their original intentions.

17. The Parties hereby sign this Integrity Pact at _____ on

BUYER	BIDDER
_____	_____
MINISTRY OF DEFENCE, GOVERNMENT OF INDIA	CHIEF EXECUTIVE OFFICER
Witness 1. _____ 2. _____	Witness 1. _____ 2. _____

****

Refers to Para 8.1 of
Pre-Contract Integrity Pact

EMD BANK GUARANTEE FORMAT

Whereas ……(hereinafter called the "Bidder") has submitted their offer dated…….for the supply of …… (hereinafter called the "Bid") against the Buyer's Request for proposal No. …… KNOW ALL MEN by these presents that WE ……of …….. having our registered office at ……. are bound unto ……. (hereinafter called the "Buyer") in the sum of …… …… ……for which payment will and truly to be made to the said Buyer, the Bank binds itself, its successors and assigns by these presents.

Sealed with the Common Seal of the said Bank this…… day of …….20……

The conditions of obligations are:-

(1) If the Bidder withdraws or amends, impairs or derogates from the Bid in any respect within the period of validity of this tender.

(2) If the Bidder having been notified of the acceptance of his tender by the Buyer during the period of its validity.

(a) If the Bidder fails to furnish the Performance Security for the due performance of the contract.

(b) Fails or refuses to accept/execute the contract.

(3) If the bidder violates Pre-Contract Integrity Pact.

WE undertake to pay the Buyer up to the above amount upon receipt of its first written demand, without the Buyer having to substantiate its demand, provided that in its demand the Buyer will note that the amount claimed by it is due to it owing to the occurrence of above mentioned conditions, specifying the occurred condition or conditions.

This guarantee will remain in force upto and including 45 days after the period of 18 months/ contract signing whichever is later and any demand in respect thereof should reach the Bank not later than the above date.

…….

(Signature of the authorized officer of the Bank)

Name and designation of the officer

Seal, name & address of the Bank and address of the Branch

Appendix K
(Refers to Para 6 of RFP)

CRITERIA FOR VENDOR SELECTION / PRE-QUALIFICATION

1. The following parameters may be used, as a guideline.

Ser No	Parameter	Criteria
(a)	**General**	
(i)		Applicant Entity should be an Indian Vendor as defined at Paragraph 20 of Chapter I of DAP 2020.
(ii)		Business dealing with applicant Entity or any of its allied entities should not have been suspended or banned, by MoD/ SHQ or any Government Department or organization (as defined in Guidelines for Penalties in Business Dealings with Entities issued vide Ministry of Defence, D (Vigilance) MoD ID No 31013/I/2006-D(Vig) Vol II dated 21 Nov 2016). None of the Promoters and Directors of applicant entity should be a willful defaulter.
(iii)		"Entities" will include companies, with whom the Ministry of Defence has entered into, or intends to enter into, or could enter into contracts or agreements.
(iv)		"Applicant entity" may be a company, subsidiary, an associate company (as defined in the Companies Act, 2013), a consortium or a Joint Venture (JV).
(b)	**Financial**	
(i)	Credit Rating (Desirable Financial Parameter)	Long term credit rating equivalent to CRISIL rating on Corporate Credit Scale as CCR-BBB or better and SME-04 or better for SMEs issued by credit rating agencies recognized by SEBI. Credit rating should be as on 31st March of the previous financial year
(ii)	Average Annual Turn Over	Min Avg Annual Turnover for last 03 financial years, ending 31st March of the previous financial year, should not be less than 30% of estimated cost of project .
(iii)	Net Worth	Net worth of entities, ending 31st march of the previous financial year, should not be less than 5% of the estimated cost of the project.
(iv)	Insolvency	The entity should not be under insolvency resolution as per Indian Bankruptcy Code (IBC) at any stage of procurement process from the issuing of RFP to the signing of contract.
(c)	**Technical**	
(i)	Nature of Business	Vendor shall be a manufacturing entity or System Integrator of defence equipment and not a trading company, except in cases where the OEM participates only through its authorised Vendors.
(ii)	Experience in related field	Min 02 Yrs experience in broad areas like manufacturing/ integration/ fabrication of Software Defined Radio Sets. If not, then cumulative experience of at least three (03) years in above areas, resulting in gaining of competence for manufacturing software defined Radio Sets.
(iii)	Integration Experience	Where product involves integration, previous experience of not less than one

		year/ one project in integration of systems/ equipment shall be required.
(d)	**Others**	
(i)	Industrial License	Vendor should be either holding a valid defence industrial license or should have applied the same before responding to RFP. In case the vendor must confirm holding of IL before commencement of Demonstration. (Items requiring IL will be as per DIPP Press Note 3 of 2014 as amended from time to time).
(ii)	Registration	Registered for Min 02 Years(01 year for SMEs). Min no of years not applicable for JVs constituted specifically for a project.

Starts Ups/MSMEs.

(i) Start ups would be defined asper G.S.R. 127 E dated 19 Feb 2019 (as amended from time to time).

(ii) Note: Start Ups should not be confused with New entrants who may be high/ mid sized groups having financial support and manufacturing experiences and now venturing into Defence Production).

Appendix L
(Ref Para 39 of RFP)

DARFT ATP GUIDELINES

1. Draft Acceptance Test Procedure for the Equipment/ System should mainly consist of the following: -

(a) **Scope & Introduction.** Includes the scope, introduction & propose of the document and general information about the equipment.

(b) **Brief description of the Equipment/ System.** Brief description of the equipment/ system be highlighted indication the salient features, Equipment/ System configuration, interfaces involved and its compatibility and role in the main system where it is intended to be used.

(c) **Safety/ Security aspects, if any.**

(d) **Technical Specifications.** TS of the equipment be indicated along with dimension, weight of the equipment etc. operational requirements & Pictorial representation of the equipment/ system be provided under this section.

(e) **Reference documents including list of drawings, related Standards, Specifications etc.** Includes Reference documents/ drawings of the equipment, Standards/ Specifications up to which he equipment/ system is complied.

(f) **Bill of Materials**. BoM as per the following format be included.

S. No	Item Name/ Description	Part Number	NSN Number	Drawing Number	Manufacturer	Schematic Reference	Standard of Reference	Qty Nos	Mill/ Industrial/ Commercial

(g) **Test Instruments / Accessories required.** Test Instruments/ Accessories required for conduct of ATP be mentioned along with Part number, Make/ Model etc.

(h) **Qualification/ Environmental Tests.** Applicable class from relevant JSS, as per RFP for Environmental testing be mentioned along with test severities and procedures to be followed for the conduct of the test. Pre, in-situ & Post Performance test to check the performance of the equipment be included.

(j) **Acceptance/ Performance Tests.** Includes the Visual, Electrical & Functional tests. Functional Test procedure along with diagram showing Test set up to be mentioned. Final acceptance/ Performance checks comes under this section. Tests can be carried out under lab & field conditions needs to be mentioned separately.

(k) **Applicability of ESS/ Endurance test.** ESS procedure to be followed be mentioned and the procedure for carrying out the Endurance test be included.

(l) **Quality Audit points/ Checks/ Methodology including Real Time/ Online Audit activities & list of critical processes.** Process audit methodology to be carried by mentioned.

(m) **Quality Audit Flow Chart/ Process Monitor Points.** Mutually agreed Audit flow chart be mentioned by quoting Relevant ISO standards.

(n) **Operational checks/ Tests.** Includes Quick checks/ Tests with ATE/BITE/Processor based Auto Diagnostic checks on the store, if equipped with, before release of the store to the Consignee.

(o) **Test & Measurement Record (TMR).** TMR sheet with expected output be mentioned.

(p) **Acceptance criteria including Sampling Plan, if any.** Acceptance criteria be mentioned under this section.

Note

(i) Weight and dimension should have tolerance.

(ii) Weight of the system shall specify along with power systems including Genset/ UPS wherever required.

(iii) Sampling plans to be invoked whereas feasible.

(iv) Certain test requires permission from authorities such as long range comn, jamming tests, detection of drones, use of DEW etc. Necessary permissions need to be obtained by SELLER.

Appendix M
(Refers to Para 51 of RFP)

DOCUMENTS TO BE SUBMITTED BY THE BIDDER ALONG WITH THEIR TECHNO-COMMERCIAL PROPOSALS

The list of documents which needs to be mandatorily submitted by the Bidders as part of Technical Proposal are placed below. Non-submission of the documents may result in disqualification of the Bidder from the bidding process.

Ser No.	Reference	Document Description
1.	Para 5 of RFP	Declaration by Bidder : Debarment of vendors
2.	Para 16 of RFP	Declaration by Bidder: Government Regulation
3.	Para 17 of RFP	Declaration by Bidder: Obligations Relevant to Transfer of Conventional Arms
4.	Para 18 of RFP	Declaration by Bidder : Patent Rights
5.	Para 20 of RFP	Declaration by Bidder : Fall Clause
6.	Para 27 of RFP	Technical document covering performance parameters.
7.	Appendix B	Compliance Table
8.	Appendix C	Warranty Clause
9.	Appendix D	CERTIFICATE: Malicious Code
10.	Annexure I to Appendix E	Manufacturer’s Recommended List of Spares (MRLS)
11.	Annexure II to Appendix E	List of SMT/STEs, Jigs, Fixture and Infrastructure
12.	Annexure III to Appendix E	Technical Literature
13.	Annexure IV to Appendix E	Training Aggregates
14.	Appendix H	Price Bid
15.	Annexure I to Appendix J	Pre-Contract Integrity Pact
16.	Annexure I to Appendix J	EMD

Appendix N

GLOSSARY

AMC	Annual Maintenance Contract
AoN	Acceptance of Necessity
ATP	Acceptance Test Procedure
CAMC	Comprehensive Annual Maintenance Contract
CKD	Completely Knocked Down
CNC	Contract Negotiation Committee
DAC	Defence Acquisition Council
DGAQA	Director General of Aeronautical Quality Assurance
DGNAI	Director General Naval Armament Inspectorate
DGQA	Director General of Quality Assurance
DPB	Defence Procurement Board
DAP	Defence Acquisition Procedure
DRDO	Defence Research and Development Organisation
EMC	Electro Magnetic Compatibility
EMI	Electro Magnetic Interference
EPP	Enhanced Performance Parameters
ESP	Engineering Support Package
EMD	Earnest Money Deposit
FET	Field Evaluation Trials
GoI	Government of India
IC	Indigenous Content
ICG	Indian Coast Guard
IDDM	Indigenously Designed & Developed Manufactured
IM	Indigenously Manufactured
IP	Integrity Pact
LRU	Line Replaceable Unit
MET	Maintainability Evaluation Trial
MoD	Ministry of Defence
MRLS	Manufacturer Recommended List of Spares
M-ToT	Maintenance Transfer of Technology
NCNC	No Cost No Commitment
OEM	Original Equipment Manufacturer
OTE	Open Tender Enquiry
PA	Production Agency
PCIP	Pre Contract Integrity Pact
QA	Quality Assurance
RFP	Request for Proposal
SPB	Services Procurement Board.
SHQ	Service Headquarters
SKD	Semi Knocked Down
SRU	Shop Replaceable Unit
TEC	Technical Evaluation Committee
ToT	Transfer of Technology