



**Govt. of India
India Meteorological Department**

Tender Enquiry No. CPU/53/1218/1525 Dated: 06/12/2018

NOTICE INVITING TENDER (NIT)

1. Director General of Meteorology (DGM), India Meteorological Department (IMD), Government of India, on behalf of President of India invites ONLINE tenders in two bid systems i.e. (i) Technical bid & (ii) Price bid from eligible and qualified bidders, authorized Service Providers (ASPs) for

“Supply, Installation and Commissioning of 11 C-band Dual Polarized DWRs”.

2. Name of Service:

“Supply, Installation and Commissioning of 11 C-band Dual Polarized DWRs”

3. Tender schedule is as follows:

1.	PRE-BID Conference (A) Date & Time (B) Venue	21.12.2018 at 1100 Hrs in O/o D.G.M (UAID), I.M.D. Lodi Road, New Delhi- 110003.
2.	Closing date and time for submission of tender	31.01.2019 at 1700 Hrs
3.	Tender Opening date & time (Technical Bid)	05.02.2019 at 1000 Hrs
4.	Place of Tender opening	Central Purchase Unit, O/o DGM, IMD Lodi Road, New Delhi

4. Bidders shall ensure that their tenders are complete in all respects before uploading the same on CPP Portal.

5. Earnest Money Deposit (EMD) Rs.2,00,00,000/- (Rupees Two Crore only) or equivalent Foreign Currency as on date (US Dollar/Euro) should be submitted by the bidder in the form of Bank Guarantee or FDR only.

6. Bidder must submit copy of PAN issued by Income Tax department of India.
7. Bidder may submit combined quotes for A & B or separately for A or B.
8. Bidder may download the Tender Document from the Departmental web site www.imd.gov.in or from CPP Portal www.eprocure.gov.in and submit their online bid documents through CPP Portal www.eprocure.gov.in along with the Earnest Money Deposit (EMD) for the tender as mentioned above in the form of Bank Guarantee (BG)/FDR.
9. BG/ FDR drawn on a commercial bank in India, drawn in favour of “Administrative Officer (DDO), O/o Director General of Meteorology , India Meteorological Department, New Delhi” and payable at New Delhi.
10. All prospective bidders are requested to attend the Pre-Bid meeting as mentioned above. The venue, date and time are indicated in the Para-4 above.
11. In the event of the tender opening date being declared as holiday for the purchase organization, the tender will be opened on the next working day; the venue and time of tender opening will remain the same.
12. Clarification needed, if any, may be sent in writing/e-mail on or before 17.12.2018.
13. Reply in this regard shall be given to the bidders during Pre-Bid meeting. Minutes of the Pre-Bid meeting will be uploaded on CPP Portal and IMD Website. Bidders are advised to visit IMD Website/ CPP Portal.

Purchaser :

**The President of India
Through Central Purchase Unit,
Office of Director General of Meteorology,
India Meteorological Department,
Lodi Road, New Delhi-110003
Telefax No: 011-24698148, 011-43824389**

Consignee:

DGM (UAID), RADAR LAB,
India Meteorological Department,
Lodi Road, New Delhi-110003.
Phone no.: 01143824381

TENDER DOCUMENT FOR PROCUREMENT OF

**ELEVEN NUMBERS
OF
C – BAND DUAL POLARIZED
DOPPLER WEATHER RADAR
SYSTEMS**

30th Oct, 2018

**(Upper Air Instruments Division)
India Meteorological Department
Lodi Road,
New Delhi-110 003.**



TERMS & CONDITIONS AND TENDER DOCUMENT

- CHAPTER-1:** INSTRUCTIONS TO BIDDERS (ITB)
- CHAPTER-2:** CONDITIONS OF CONTRACT (CoC)
- CHAPTER-3:** SPECIAL CONDITIONS OF CONTRACT (SCC)
- CHAPTER-4:** SCHEDULE OF REQUIREMENTS AND SPECIFICATIONS & ALLIED
TECHNICAL DETAILS
- CHAPTER-5:** PRICE SCHEDULE
- CHAPTER-6:** OTHER STANDARD FORMS (Annexures)

**(Upper Air Instruments Division)
India Meteorological Department
Lodi Road,
New Delhi-110 003.**

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CHAPTER-1

INSTRUCTIONS TO BIDDERS (ITB)

1. Introduction:

The Purchaser has issued this Tender Enquiry document for purchase of goods/stores/articles and related services as mentioned in "Request for Proposal (TENDER DOCUMENT)" which also indicates, inter alia, the required stores, delivery schedule, terms and conditions and place of delivery etc. This section ("General Instructions to Bidders") provides the relevant information as well as instructions to assist the prospective bidders in preparation and submission of tenders.

Bidders shall have to agree/accept all the terms and conditions of tender including payment terms etc. Acceptance shall be unconditional and bidders shall have no claim and right in future on their terms if any.

2. Language of Tender:

The tender submitted by the bidder and all subsequent correspondence and documents relating to the tender exchanged between the bidder and the purchaser, shall be written in English language.

3. Eligible Goods and Services:

All goods and related services are to be supplied by the **Indian Equipment Manufacturing Firms or the System Integrator companies based in India.**

4. Suppliers of Imported Stores:

Firms having regular arrangement with a particular foreign manufacturer for supply of equipment and who adapt/ tropicalize the equipment to suit Indian conditions and can prove the performance of the same at their premises in India shall also be considered as suppliers.

They are required to produce documentary proof of import and certificate of origin at the time of supply. They are also required to have established facilities for after sales services for the equipment in India. The Firms are required to have valid agreements entered into between them and their foreign principals. Copy of such agreement, clearly indicating the responsibilities and duties of different partners is to be submitted along with the technical bid. Direct bid by Foreign technology partner is not acceptable.

5. Tendering Expense:

The bidder shall bear all the costs and expenditure incurred and/or to be incurred by them in preparation, and uploading their tender including attending the pre-bid conference and or arranging demonstration of Product/Services or Field trials that may be deemed necessary by the Purchaser.

6. Pre-Bid Conference:

Pre-bid conference shall be held as per Notice Inviting Tender (NIT) schedule so as to provide an opportunity to the participating bidders to interact with India Meteorological Department (IMD) with regard to various tender provisions/clauses, before the bids are submitted. Bidders

should depute their authorised representative for pre-bid meeting. In case, due to the points/doubts raised by the prospective bidders, tender needs to be modified, the same will be considered for modification. **After pre-bid conference, tender conditions will be frozen. No change will be permissible after opening of Bids.** Request for clarification needed if any may be sent by email before the commencement of pre-bid meeting, latest by 17-12-2018. Pre-Bid minutes shall be uploaded on e-procurement portal (eprocure.gov.in/eprocure). No reply in this regard shall be sent to individual bidders.

7. Regular visit of website:

Prospective bidders are advised to see Central Public Procurement (CPP) portal eprocure.gov.in/eprocure on regular basis for any change in NIT schedule like amendment / corrigendum in Tender Document including technical requirement and pre-bid minutes etc.

8. Amendments to Tender enquiry (TE) documents:

At any time, prior to the deadline for submission of tender, the purchaser may, for any reason deemed fit by it, modify the Tender Enquiry document by issuing suitable amendment(s) to it.

The amendment will be uploaded on CPP portal eprocure.gov.in/eprocure only. In order to provide reasonable time to the prospective bidders to take necessary action in preparing their tenders as per the amendment, the purchaser may, at its discretion extend the deadline for the submission of tenders and other allied time frames, which are linked with that deadline.

9. Documents Comprising the Tender:

The tender is to be submitted in Two Bid System. The "Techno - Commercial Bid" and "Price Bid" prepared by the bidder shall comprise the followings:

(A) Techno - Commercial Tender (Un-priced Tender):

The following documents are to be furnished by the bidder along with Technical Bid (Techno-Commercial Bid) as per the tender document:

Bidder shall upload following documents on CPP Portal eprocure.gov.in/eprocure

- a. Registration certificate of bidding firm with any state and central government body of India. Credential/document shall be attached.
- b. Checklist section (as per Annexure-I) properly filled and signed.
- c. Scanned copy of Earnest Money Deposit (EMD) in the form of Fixed Deposit Receipt/ Bank Guarantee (FDR/BG). Original EMD in physical form shall be submitted to Central Purchase Unit of IMD on or before opening of tender.
- d. Documentary evidence for fulfillment of Eligibility /Qualification criteria (s).
- e. Certificate issued by competent authority from Ministry of MSME/ National Small Industries Corporation shall be uploaded on eprocure.gov.in/eprocure (CPP Portal) and original shall be submitted in Central purchase Unit of IMD on or before opening of tenders.

- f. It is compulsory for manufacturing firms in India to quote in Indian currency, however, suppliers and integrators can quote partly in foreign currency for imported segment and partly in Indian currency for indigenous segment of equipments. They are required to submit a list of the items being imported along with the technical bid and have to produce documentary proof of import and certificate of origin at the time of supply. Joint inspection of the imported material will be done at the time of opening of the import consignment and JRI (as per format at Annexure V) will be signed by both the purchaser and the bidder. Use of the items mentioned in JRI will be verified later at the time of commissioning. However IMD will not make payment for the foreign components till the delivery of the complete radar system at site.
- g. Copy of agreement between bidding firm in India and their foreign principal indicating precise relationship between them and their mutual interest in this tender must be furnished along with their technical bid.
- h. Tender terms & Conditions Acceptance Form (as per Annexure-II) duly signed.
- i. Technical Bid.
- j. List of deliverable (un-priced/without price) shall be submitted with detailed make & model etc. This should be exactly same as attached in price bid.
- k. Pre Contract Integrity pact to be provided along with bid document. (as per Annexure-X)

The above documents must be signed & stamped and scanned & shall be attached in the beginning of technical bid.

- (B)** The following documents are to be furnished by the bidder along with Price Bid
- a. All pages of the price bid should be page numbered, indexed and signed with company/firm seal by authorized signatory.
 - b. Price Bid shall be preferred as per price schedule format (Chapter-5).
 - c. Costing of each and every item, sub items offered in bidder's technical bid, shall be done with all breakup prices. Cost of the imported segment (in foreign currency) and Indian segment (in Indian Rupees) are to be indicated separately.
 - d. The bidder shall indicate on the Price Schedule specifying all components (main units and sub units etc. of each item) of prices shown therein including the unit prices and total tender prices of the goods (Hardware & Software), services, packing, inland transportation/freight/insurance to the sites, GST or any other duties and taxes applicable against the requirement.
 - e. Wherever, the Purchaser's invitation to tender calls for installation and commissioning of the instrument/equipment by the bidder, the bidders must clearly and separately quote the prices for the supply of the stores and the charges and the terms for installation and commissioning as the case may be. The charges towards installation and commissioning should not be included in the price of the stores.
 - f. The Supplier shall bear all the taxes (GST/IGST/SGST/Income-tax /WCT/or any other taxes) levied by the state / central government in force in India, as per the rates prevailing at the time of undertaking the job in accordance with the Income-tax Act.
 - g. Comprehensive Annual Maintenance Contract (CAMC) shall be only for the maintenance of stores (equipment and software only) therefore prospective bidders are advised to quote CAMC charges accordingly and specifically for seven years after the expiry of warranty period. The charges are to be quoted for each year, on annual basis. It should not be quoted in terms of percentage of project cost. The cost of warranty charges, installation charges, training charges etc are not covered under CAMC. Price bids shall not be accepted if CAMC charges are quoted in percentage.

- h. In case any charges not mentioned in the price bid, it will be treated as all the charges are free of cost for that item.
- i. Vendors shall quote prices on F.O.R destination (at the sites of consignee) basis.
- j. IMD being a scientific department may provide custom duty exemption certificate for the items being imported for this tender. However IMD shall not be responsible for custom clearance. Prices quoted by the bidder shall remain firm and fixed during the period of the contract.
- k. Statutory levies, taxes and duties etc., if any, chargeable on the goods are payable on actual basis as applicable.
- l. If there is a discrepancy between the amount expressed in words and figures, the amount in words shall prevail.

Price bid shall prima-facia be rejected in case of any deviation from the un-priced bid given with the technical bid of the bidder.

10. Signing and Submission of Tender:

Properly signed and stamped tender on the company letterhead shall be uploaded ONLINE through CPP Portal, eprocure.gov.in/eprocure. Hard copy of bids shall not be accepted for submission. The tender shall not contain any over writing. Only pdf format of the tender shall be uploaded on CPP portal.

11. Alteration and Withdrawal of Tender :

The bidder after uploading its tender on CPP portal is permitted to alter / modify its tender within the deadline for submission of tenders.

12. Opening of Tenders:

The purchaser will open the tenders at the specified date and time and at the specified place as indicated in the NIT. In case the specified date of tender opening falls on / is subsequently declared a holiday or closed day for the purchaser, the tenders will be opened at the appointed time and place on the next working day. Authorized representatives of the bidders, who have submitted tenders on time may attend the tender opening, provided they bring with them letter of authority from the corresponding bidders.

Two Bid system will be as follows. The Technical Bids are to be opened in the first instance, at the prescribed time and date. These Tenders shall be scrutinized and evaluated by the competent committee/ authority with reference to parameters prescribed in the TE document. During the Technical Bids opening, the tender opening official(s) will read the salient features of the tenders like delivery period, Earnest Money Deposit and any other special features of the tenders, as deemed fit by the tender opening official(s). Thereafter, in the second stage, the Price Bids of technically qualified bidders only shall be opened for further scrutiny and evaluation on a date notified after evaluation of the techno commercial tender.

13. Scrutiny and Evaluation for acceptance of tender

- (A) **Unresponsive bids:** (Scrutiny separately carried out by a Bid acceptance mechanism prior to technical evaluation)

The tenders will be scrutinized to determine whether they are complete and meet the essential and important requirements, conditions etc. as prescribed in the TE document. The tenders are liable to be treated as non - responsive and will be summarily ignored if following are not essentially provided along with technical bids.

- a. *Registration certificate of bidding firm with any state and central government body of India. Credential/document shall be attached.*
- b. *Tender is unsigned or is incomplete, is not uploaded on e-procurement portal due to any reason with in stipulated period.*
- c. *Properly signed and stamped checklist (Annexure-I) and fully furnished compliance statement is not enclosed.*
- d. *Tender Acceptance Form (Annexure-II) not duly signed and stamped. (i:e all the terms & conditions of tender document are acceptable). Original Letter shall be enclosed in technical bid.*
- e. *Tender validity is shorter than the required period.*
- f. *Required EMD has not been provided unless exempted.*
- g. *Bidder has not agreed to give the required performance security.*
- h. *Copy of agreement of bidding firm from India with its foreign principal with the precise relationship between them and nature of services which would be available from bidding firm in India, is not attached with the tender.*

(B) Technical Evaluation:

After the tender acceptance, tenders shall be technically evaluated by the committee constituted by competent authority with reference to parameters prescribed in the TENDER DOCUMENT .

If during the preliminary examination, the purchaser finds any minor informality and/or irregularity and/or non-conformity regarding technical evaluation in a tender, the purchaser may waive the same provided it does not constitute any material deviation and has no financial impact and, also, does not prejudice or affect the ranking order of the bidders.

Wherever necessary, the purchaser will convey its observation on such 'minor' issues to the bidder asking the bidder to respond by a specified date. If the bidder does not reply by the specified date or gives evasive reply without clarifying the point at issue in clear terms, that tender will be liable to be ignored.

(C) Financial evaluation:

After Technical Evaluation, the Price Bids of only the technically qualified bidders shall be opened for further scrutiny and evaluation on a date notified after evaluation of the techno commercial tender. The purchaser shall evaluate the technically qualified **financial bids for deciding lowest bidder (L- I) on the basis of landing costs of the store including all applicable taxes/levies/duties etc.**

The cost of Warranty/Extended Warranty and CAMC charges etc will be added to evaluate financial bid for deciding lowest bidder L-1. Charges towards Insurance, Freight and transportation of goods up to delivery at sites etc applicable from time to time for taking purchase decision shall also be added. These should be clearly indicated by the bidder.

IMD may provide the CDEC for imported items. In case the CDEC is not accepted the payment of custom duty will be reimbursed to the bidder by IMD on proof of actual payment.

For other duties and taxes like GST, exemption certificates may be provided by IMD, however if the same is not agreed to by any government agency, the amount will be reimbursed to the vendor on submission of original receipt.

IF ANY CHARGES ARE NOT INDICATED SPECIFICALLY AND SEPARATELY IN THE BID, SAME WILL BE TREATED AS INCLUSIVE.

Conversion of currencies to Indian Rupees for Comparison of Tenders

In case the TE document permits the bidders to quote their prices in different currencies, all such quoted prices of the responsive bidders will be converted to a single currency viz., Indian Rupees for the purpose of equitable comparison and evaluation, as per the selling rate of exchange of State Bank of India prevailing on the date of opening of financial bids.

14. Packing and Marking:

The packing for the goods provided by the supplier should be strong and durable enough to withstand, without limitation, the entire journey during transit including transshipment (if any), rough handling, open storage etc. without any damage, deterioration etc.

15. Inspection, Testing and Factory acceptance test (FAT):

The purchaser/consignee reserves the right to inspect goods at factory site/supplier site before their dispatch if required and mentioned in technical requirement (TENDER DOCUMENT) section. Goods accepted by the purchaser/consignee and/or its inspector at initial inspection shall in no way dilute purchaser's/consignee's right to reject the same later, if found deficient in terms of the clause of the contract. Purchaser may not undertake any Pre dispatch inspection, unless mentioned, for imported stores in the suppliers country of origin and the equipment will be sent to the purchaser on the basis of supplier's own inspection at the premises and guarantee and warranty. The equipment will be accepted subject to final inspection and test on commissioning and before handing over the equipment to consignee at the site.

CHAPTER-2

Conditions of Contract (CoC)

Bidders shall have to agree/accept all the terms and conditions of tenders including payment terms etc. Acceptance shall be unconditional and bidders shall have no claim and right in future on their terms if any.

NOTE: Whenever there is any conflict between the provisions in the GCC regards to specific Para under this section and that in the "Tender Document" "List of requirements/ technical specifications", the provision contained in the Tender Document shall prevail and have an over-riding effect. Any Special instructions as per "Tender Document - List of requirements/ technical specifications" section will also apply for this purchase. The conditions (like qualification criteria, delivery schedule, mode of delivery & sites of delivery etc.) mentioned in "Tender Document - List of requirements/ technical specifications section" etc. will also apply for this purchase.

1. Alternative Tenders:

Alternative Tenders are not permitted. However the bidders can quote alternate models meeting the tender specifications of same manufacturer with single EMD.

2. Tender Validity:

The tenders shall remain valid for acceptance for a period of 180 days (one hundred eighty days) after the date of tender opening prescribed in the TE document.

3. Purchaser's Right to accept any tender and to reject any or all tenders:

The purchaser reserves the right to accept in part or in full any tender or reject any tender without assigning any reason or to cancel the tendering process and reject all tenders at any time prior to award of contract, without incurring any liability, whatsoever to the affected bidder or bidders.

4. Tender Fee: No tender fee is charged on the downloaded and e-tenders.

5. Price preference:

Price preference shall be given to Micro and Small Industries registered as manufacturers for stores and services specified in this tender document with National Small Industries Corporation or any other government agencies as per the latest guidelines/orders from Government of India. Purchase preference and quantity etc shall be decided as per the Government of India orders. The bidders shall have to upload and submit the copy of valid registration certificate. Micro and small Enterprises are exempted for submitting fees/cost towards tender document and submission of earnest money deposit (EMD) also known as security deposit. However Micro and small Enterprises are not exempted for performance security or Bank Guarantee (BG). Micro and small Enterprises shall have to furnish performance security if purchase order is placed to them. There is no relaxation in this regard.

6. Eligibility & Qualification criterion for Bidders:

Firms in given below category are eligible to participate in tender subject to registration of the firm with government bodies as per act /rules and also fulfilling of other specific qualification criteria, terms and conditions mentioned in technical requirement section and tender enquiry document.

- a) Indian Original Equipment Manufacturer (IOEM).
- b) Integrator companies / suppliers in India having full back to back maintenance support agreement for hardware & software with OEM. In this case the bidder shall have to submit authorization certificate from OEM, that they will provide inventory of requisite spares, accessories and service support after sale.

Copy of agreement, with their foreign principal with the precise relationship between them, their mutual interest and nature of services which would be available from bidding firm from India, shall be submitted along with their tender. Strategy/ evidence of foreign principal agreed to provide spares and technical support after sale needs to be submitted and clearly specified.

Firms having regular arrangement with a particular foreign manufacturer for supply of equipment and who adapt and tropicalise the equipment to suit Indian conditions and can prove the performance of the same at their premises in India shall be eligible. They are required to produce documentary proof of import and certificate of origin at the time of supply. They are also required to have established facilities for after sales services for the equipment in India.

The bidder should have turnover of **40 crores per annum**, during last three years. The bidders should have earned profit for two years out of three years ending on 31st March, 2018. Turnover/ profit to be certified by authorized financial authority (CA). Documentary evidence for the same is to be submitted along with the technical bid. In case of Integrator companies in India the financial as well as technical eligibility of the parent company will be acceptable.

Price may be quoted in Indian currency towards indigenous components supply, installation, commissioning, allied work and services and if required by the vendor the prices of foreign components will be paid in foreign currency. But this has to be clearly indicated in the technical as well as the financial bid. No change will be allowed after opening of the tenders. The complete name and address of the bidding firm in India and its permanent income tax account number (PAN) as allotted by the Indian Income Tax authority must be submitted.

7. Earnest Money Deposit (EMD):

The bidder shall furnish along with its tender, earnest money for an amount as shown in the tender notice. The earnest money is required to protect the purchaser against the risk of the bidder's unwarranted conduct.

The bidders who are registered as OEM on Tender submission date with Directorate General of Supplies & Disposals or with National Small Industries Corporation, New Delhi, shall be eligible for exemption from submission EMD. Micro and small Enterprises specified

by Ministry of Micro, Small & Medium Enterprises (MoMSME) are exempted from earnest money deposit (EMD). The EMD shall be furnished in Fixed Deposit Receipt (FDR) or Bank Guarantee (BG) (as per Annexure-III) from any commercial bank doing government business. FDR may be issued in the favour of "DDO, O/o DGM, IMD, New Delhi". Bank Guarantee issued from the foreign banks must be authenticated by STATE BANK OF INDIA or any other Nationalized Bank of India. The clause "encashment/ release of FDR/ BG requires clearance certificate from Purchaser i.e. DGM, IMD" must be mentioned in issued FDR/ BG by Bank.

The earnest money shall be valid for period of sixty (60) days beyond the validity period of the tender.

8. Refund of EMD:

EMD of the unsuccessful bidders will be returned to them without any interest, after expiry of the tender validity period. EMD of the successful bidder will be returned without any interest, after receipt of performance security from the bidder.

9. Forfeit of EMD:

Earnest money of a bidder will be forfeited, if the bidder withdraws or amends its tender or impairs or derogates from the tender in any respect within the period of validity of its tender or if it comes to notice that the information/documents furnished in its tender is incorrect, false, misleading or forged without prejudice to other rights of the purchaser.

The successful bidder's earnest money will be forfeited without prejudice to other rights of Purchaser if supplier fails to furnish the required performance security within the specified period. Firm shall have to extend the validity of EMD if extension of tender validity is agreed on the request of purchaser in exceptional cases.

10. Performance Security:

Successful bidder shall submit performance security within thirty (30) days from date of dispatch of supply order/award of contract by the purchaser or within twenty one (21) days from the receipt of supply order by the supplier whichever is earlier.

- a. The purchaser may consider annulment/cancellation of supply order/ award of contract if performance security not received in stipulated time.*
- b. There is no relaxation/exemption in submitting of performance security.*
- c. The supplier, shall furnish performance security to the purchaser for an amount equal to ten percent (10%) of the total value of the contract excluding CAMC if any, valid up to sixty (60) days beyond the warranty period.*
- d. The CAMC service provider shall furnish performance security to the purchaser for an amount equal to five per cent (5%) of the total value of the CAMC Value, valid up to sixty (60) days after the date of completion of all contractual obligations by the supplier/service provider.*
- e. Performance Security has to be submitted irrespective of its registration DGS&D/ NSIC etc. Performance security is not relaxed to any supplier/service provider.*
- f. Performance Security shall be in anyone of the forms namely FDR or BG drawn/ issued by a commercial bank doing government business in the prescribed form in favour of the purchaser. In the event of any amendment issued to the contract, the supplier shall, within*

twenty-one (21) days of issue of the amendment, furnish the corresponding amendment to the Performance Security (as necessary), rendering the same valid in all respects in terms of the contract, as amended.

The purchaser will release the Performance Security without any interest to the supplier/ service provider on completion of the supplier's all contractual obligations including the warranty obligations & after receipt of performance security for CAMC (if applicable) . The supplier shall submit pre receipt for obtaining back their security.

11. Terms of Delivery:

Goods shall be delivered by the supplier in accordance with the terms of delivery schedule specified in the contract. Generally it is F.O.R destination for domestic supply. Suppliers should not deliver the goods without any valid delivery period. Purchaser shall not be held responsible for anything (payment and loss of stores etc) if stores supplied without any valid delivery period as purchaser reserve the right to reject the delivery and terminate the supply order.

12. Delivery schedule: As per section under TENDER DOCUMENT - List of Requirements.

Date, on which all the stores as per supply order have been delivered to the consignee shall be treated as the final date of delivery of stores for calculating liquidated damages etc.

13. Force Majeure:

Force Majeure means an event beyond the control of the supplier and not involving the supplier's fault or negligence and which is not foreseeable. Such events may include, but are not restricted to, acts of the purchaser either in its sovereign or contractual capacity, wars or revolutions, hostility, acts of public enemy, civil commotion, sabotage, fires, floods, explosions, epidemics, quarantine restrictions, strikes, lockouts, and freight embargoes. If there is delay in performance or other failures by the supplier to perform its obligation under its contract due to event of a Force Majeure, the supplier shall not be held responsible for such delays/failures.

If a Force Majeure situation arises, the supplier shall promptly notify the purchaser in writing of such conditions and the cause thereof within twenty one days of occurrence of such event. Unless otherwise directed by the purchaser in writing, the supplier shall continue to perform its obligations under the contract as far as reasonably practical, and shall seek all reasonable alternative means for performance not prevented by the Force Majeure event. If the performance in whole or in part or any obligation under this contract is prevented or delayed by any reason of Force Majeure for a period exceeding sixty days, either party may at its option terminate the contract without any financial repercussion on either side. There may be a Force Majeure situation affecting the purchase organization only. In such a situation the purchase organization shall take up with the supplier on similar lines as above for further necessary action.

14. Warranty:

The warranty shall be on-site warranty for 03 years. The quoted rate shall deemed to include the same. All supplied stores should be free from all defects and faults in material workmanship and manufacture. They should be of the highest grade and consistent with the established and generally accepted standards for material of the type used and in full conformity with the specifications, drawings, or samples and shall, if operable, operate properly. The Seller shall be bound to furnish a clear written warranty regarding the same. The

Seller will be required to replace them free of cost inclusive of all freight and handling charges. The supplier shall provide warranty certificate from the OEM for the goods along with date of manufacturing of stores/products.

The supplier shall take over the replaced parts/ goods after providing their replacements and no claim, whatsoever shall lie on the purchaser for such replaced parts/goods thereafter. Custom charges if any, for re-export/re-import of defective parts/repairs or replaced parts to the foreign supplier country for repairs etc shall be borne by supplier only. Transportation cost for sending defective parts for repairs and sending back repaired or replaced one to IMD site(s), shall be borne by supplier itself. Warranty shall be quoted as per IMD requirements i.e. three years after commissioning of the individual Radars, otherwise the Bid shall be considered as unresponsive. Other condition under warranty clause of "List of requirements/ technical specifications" section shall also be applicable.

15. Comprehensive Annual Maintenance Contract (CAMC) for Equipment and Software

The Purchaser/Consignee reserves the rights to enter into Comprehensive Annual Maintenance contract between Consignee and the Supplier after the completion of warranty period. CAMC shall be for the maintenance of stores (equipment and software only). Prospective bidders are advised to quote accordingly and specifically. Generally, payment for maintenance contract is made on quarterly basis unless it is specified otherwise in the technical section. The indenter has the discretion to decide about awarding CAMC or not however the ranking of the bidders will be done with CAMC cost i.e. while deciding the L1 bidders cost of CAMC will be added. As per IMD requirements, year wise CAMC shall be quoted for 07 years after completion of 03 years Warranty period, otherwise the Bid shall be considered as unresponsive.

16. Penalty clause/Liquidated damages clause (LD) for delayed stores & Services:

- (a) The supplier shall deliver the goods and perform the services (like installation & commissioning etc) under the contract within the time schedule specified by the purchaser in the "List of requirements/ technical specifications" section and as incorporated in the supply order. The delivery date, unless delivery is divided, on which all the items/stores/materials/services etc as per supply/Purchase order are delivered shall be taken into account for penalty/LD purpose.
- (b) The purchaser shall, without prejudice to other rights and remedies available to the purchaser under the contract, deduct as penalty/liquidate damage from the contract price a sum equivalent to 0.5% (half percent) per week of delay or part thereof on delayed supply of goods and/or delayed services subject to a maximum of 10% of the contract price of delayed items. L/D shall not be imposed under force majeure conditions. Once the maximum is reached purchaser may also consider followings:
 - (i) Forfeiture of the performance security and
 - (ii) Termination of the contract for default.

Note:

The supplier shall not be held responsible for delay in delivery of stores and their installation for the followings reasons:

- (a) Delay in providing Entry permits/Road Permits (if required) to the supplier by the consignee.

- (b) Delay in providing proper site(s) by the consignee to the supplier for installation of stores.
- (c) Delay in providing No Objection Certificate (NOC) required from any other government agency/agencies.
- (d) Communication facility required for project to be provided to the supplier by the consignee if it is not the responsibility of supplier.

Penalty/Liquidated damages shall be calculated on the purchase/contract price including the element of taxes etc mentioned in the price bids. The supplier shall not dispatch the goods after expiry of the delivery period. The supplier is required to apply to the purchaser for extension of delivery period and obtain the same before dispatch. In case the supplier dispatches the goods without obtaining an extension, it would be doing so at its own risk and no claim for payment for such supply and / or any other expense related to such supply shall be against the purchaser. The supplier shall inform to the purchaser directly in writing about any delays on part of IMD.

17. Award Criteria and Tolerance Clause:

- a. The purchase order /supply order shall be awarded to the eligible responsive tender evaluated as the most economical, technically qualified and suitable to the requirements subject to the availability of funds. The purchaser reserves the right to increase or decrease the quantity of required goods up to plus minus twenty five percent (+/- 25%) till the placement of supply order without any change in the terms & conditions and prices quoted by the bidder.
- b. Based on the purchaser's requirement, a repeat order may also be placed upto **06 years** at the same price and with the same terms & conditions. These conditions are applicable for both the cases- Klystron and SSPA DWRs.

18. Modification of contract:

If necessary, during the period of the contract, the purchaser may amend the contract, by making alterations and modifications within the general scope of contract and issue a written order in this regard to the supplier at any time. If the supplier doesn't agree to the adjustment made by the purchaser, the supplier shall convey its views to the purchaser within fifteen (15) days from the date of the supplier's receipt of the purchaser's amendment / modification of the contract.

19. Taxes and Duties in India:

a. Duties and Local Taxes:

Integrator / Supplier shall pay Work Contract Taxes (WCT), GST/IGST/SGST/ Service Tax and other taxes where applicable as per existing rules at that time.

Normally materials to be supplied to Govt. Department against Govt. contracts are exempted from levy of town duty, Octroi duty, terminal tax and other levies of local bodies. The local Town/Municipal Body regulations at times, however, provide for such exemption only on production of such exemption certificate from any authorized officer. Contractors should ensure that stores ordered against contracts placed by this office are exempted from levy of town duty/Octroi duty, Terminal tax or other local taxes and duties. Exemption certificates will be issued by the department to avoid payment of such local taxes or duties,

however if not accepted by any agency the payment will be reimbursed on production of original receipts. The supplier shall pay the Octroi, entry tax etc. if exemption certificate not agreed by local authorities and same may be got reimbursed from purchaser on proof of payments to avoid delay in the supply of stores.

b. Supply of Road Permits by the indenter /consignee:

In all such cases where the requirement of Road Permit for entry of goods into a particular State is mandatory, the following provisions shall be strictly followed: -

The supplier shall request the indenter /consignee for providing Road permit within 10 days of the receipt of the Supply order. The supplier shall furnish all the necessary information and documents in this regard to consignee.

On receipt of the above request from the supplier, the consignee concerned shall arrange to provide the Road permit/Way Bill in the prescribed form to the supplier within a maximum period of two weeks so that the same reaches the supplier before the dispatch of the stores, However, in cases where the Road permit/Way Bill is issued on proof of actual invoice of the material, the consignee shall arrange to provide the Road permit/Way Bill from appropriate authorities within a maximum period of 10 days from the receipt of invoice. The supplier shall not be held responsible for any delay in supply due to non- supply/delayed supply of Road permit.

c. Income Tax and service tax etc:

Tax deducted at source (TDS) shall be done before making payment to the suppliers as per existing law in force. The bidders may visit website of Income Tax Department of India for details of Tax Liabilities, Rules, and Procedures etc. The bidders shall have to provide their Permanent Income Tax Number (PAN), TAN and GST registration number.

20. Terms and Mode of Payment:

Payment Terms: Payment, as per term mentioned below, shall be made subject to recoveries, if any, by way of liquidated damages /penalty clause /TDS or any other charges as per terms & conditions of contract if not specified elsewhere in the document.

i. Cases where installation & Commissioning to be done by supplier:

- a. Fifty percent (50%) of contract *value of stores* will be paid after receipt of goods, balance 20% payment towards stores after successful installation and rest 30% on commissioning and acceptance of the system at site including the period of endurance test of individual site.
- b. Hundred 100% payments as *value of services* such as FAT, Training, SAT, Installation & commissioning charges etc if any after their executions and successful completion. Necessary documents must be submitted for the release of each of the payments.

- c. If required, the payment for the foreign segment in favour of the foreign supplier shall be made through IRREVOCABLE LC Letter of Credit (LC) shall be established for a specific period depending on delivery schedule only after receipt of unconditional acceptance of supply/purchase order and performance security from the supplier. LC extension charges shall be borne by the supplier in case of extension of delivery period requested by the supplier and request agreed by the purchaser. *50% payment of the LC will be done after factory acceptance test (FAT) in India, 20% after complete installation and balance 30% on successful commissioning and acceptance of the system at site including the period of endurance test at individual sites.*
- d. Payment towards Comprehensive Annual Maintenance Contract Charges shall be made as per "TENDER DOCUMENT - List of requirements/ technical specifications" section. The consignee will enter into CAMC if required with the supplier at the rates as stipulated in the contract after expiry of warranty period .The payment of CAMC will be made after satisfactory completion of said period as per TENDER DOCUMENT terms and duly certified by the consignee. The consignee shall deal this issue separately and directly. The supplier shall deal CAMC agreement and payment etc directly with the consignee.
- e. The supplier shall send its claim for payment in writing, when contractually due, along with relevant documents etc., duly signed with date, to the consignees.
- f. Bills/invoices must be submitted separately for stores and services.
- g. The bidder shall submit particulars of his bank account required for making payments.
(a) Account Number (b) Bank Name (c) Branch Name (d) Address (e) IFS code (t) MICR No. (g) Telephone No. (h) SWIFT code etc.

The following documents shall be submitted:

- Three copies of supplier's invoice showing contract number, goods description, quantity, unit price and total amount.
- Consignee Receipt Certificate in original issued by the authorized representative of the consignee.
 - (iii) Copies of delivery challan identifying contents of each package.
 - (iv) Inspection certificate by the nominated Inspection agency, if any.
 - (v) Insurance Certificate.
 - (vi) Final Acceptance Report from consignee.

21. Fall Clause:

The bidder undertakes that it has not supplied/is not supplying similar products/systems or subsystems at a price lower than that offered in the present bid in respect of Ministry/Department of the Government of India or Public Sector Unit (PSU) and if it is found at any stage that similar products/systems or subsystems was supplied by the BIDDER to any Ministry/Department of the Government of India or Public Sector Unit (PSU) at a lower price, then that very price, with due allowance for elapsed time, will be applicable to the present case and difference in the cost will be adjusted from their bills, or it would be refunded by the BIDDER to the BUYER (India Meteorological Department) if the contract has already been concluded.

22. Termination of tender by the Purchaser:

From the time of submission of tender to the time of awarding the contract, if a bidder needs to contact the purchaser for any reason relating to this tender enquiry and/ or its tender, it should

do so only in writing.

In case a bidder attempts to influence the purchaser in the purchaser's decision on scrutiny, comparison & evaluation of tenders and awarding the contract, the tender shall be liable for rejection in addition to appropriate administrative actions being taken against that bidder, as deemed fit by the purchaser.

The purchaser, without prejudice to any other contractual rights and remedies available to it (the purchaser), may, by written notice of default sent to the supplier, terminate the contract in whole or in part, if the supplier fails to deliver any or all of the goods or fails to perform any other contractual obligation(s) within the time period specified in the contract, or within any extension thereof granted by the purchaser. In the event of the purchaser terminating the contract in whole or in part, the purchaser may procure goods and/or services similar to those cancelled, with such terms and conditions and in such manner as it deems fit and the supplier shall be liable to the purchaser for the extra expenditure, if any, incurred by the purchaser for arranging such procurement. If the supplier becomes bankrupt or otherwise insolvent, the purchaser reserves the right to terminate the contract at any time, by serving written notice to the supplier without any compensation, whatsoever, to the supplier, subject to further condition that such termination will not prejudice or affect the rights and remedies which have accrued and / or will accrue thereafter to the purchaser.

23. Arbitration clause:

If dispute or difference of any kind shall arise between the purchaser and the supplier in connection with or relating to the extension of contract, the parties shall make every effort to resolve the same amicably by mutual consultations. If the parties fail to resolve their dispute or difference by such mutual consultation within twenty-one days of its occurrence, then, unless otherwise provided in the "List of requirements/ technical specifications" section either the purchaser or the supplier may give notice to the other party of its intention to commence arbitration, as hereinafter provided the applicable arbitration procedure will be as per Indian Arbitration and Conciliation Act, 1996. In the case of a dispute or difference arising between the Purchaser/ Consignee and all suppliers relating to any matter arising out of or connected with the contract, such dispute or difference shall be referred to the sole arbitration of an officer, appointed to be the arbitrator by the Director General of Meteorology. The award of the arbitrator shall be final and binding on the parties to the contract. Each party shall bear its own cost.

24. Venue of Arbitration:

The venue of arbitration shall be the place from where the contract has been issued, i.e., New Delhi. The contract shall be interpreted in accordance with the laws of India.

25. List of Deliverables:

The bidder shall submit the final list of Deliverables as given at Annexure-VIIA & Annexure-VIIB for all the stores, Hardware, Software items, Subunits etc and all other services which bidder is going to offer in their technical proposal to meet the requirement under "List of requirement & Technical specifications" of this tender document. The list of deliverables shall be same as submitted in the price bid. **The price bid shall not be considered if it is not matching with the list of deliverables submitted with technical bids**

Note: It is mandatory to mention the make and model of each offered Stores/ Items.

26. Terms & Conditions of Comprehensive Annual Maintenance Contract (CAMC):

1. The CAMC includes Control Center and Radar Site Material & Services inclusive of all Computer peripherals, Printers, Radar modules, spares, components, cables, connectors etc and radar related materials like UPS, DG, Radome, Tower, etc. and the removed/replaced defective material becomes the property of "The Contractor".
2. The CAMC clause will be applicable for control center and individual radar sites separately.
3. The CAMC will commence immediately after the expiry of the warranty period. The comprehensive service includes preventive and corrective maintenance and free replacement of all the defective parts/devices. The company should submit a detailed CAMC plan including preventive maintenance schedule.
4. The "Contractor" shall supply the details of its call center meant for booking the complaints along with the contact numbers like mobile nos., phone nos., mail address and names etc of its service engineers.
5. The radar shall be decommissioned for a period of two weeks for annual preventive maintenance and upkeep in a cyclic mode.
6. The "Contractor's" engineers attending to the system are required to make all entries of their work done and corrective measures taken by them with their signatures in the log book kept with the Radar.
7. Overall uptime of the system shall be at least 95%. If there is a failure of the system for more than the criteria stipulated then the CAMC amount of 0.5% per day, for days it is down will be deducted, subjective to an upper ceiling of 10% of CAMC charges for that quarter. If the failure duration extends beyond one month then the contract may be terminated and cost of its repair from alternate source will be recovered from the "Contractor" and performance security may be forfeited. Maximum two weeks shutdown for annual maintenance shall not come under the clause. Radar down time due to external factors and severe natural calamity beyond human control shall exempt the criteria.
8. Supplier shall ensure 95% uptime by supportive manpower if found necessary.
9. Date of commencement of Annual Maintenance Period of the individual radars shall be fixed by IMD.
10. The mode of payment will be quarterly and it will be made after end of each quarter on the basis of satisfactory performance certificate from user.
11. "The Contractor" will assist IMD for regular backups of all the software. The "Contractor" is also required to restore the existing Software from the Backups whenever required.
12. "The Contractor" will also be responsible for configuring the networking components.
13. CAMC contract will be signed for seven years. If required, contract may be extended by IMD. However, IMD reserves the right to terminate the contract at any time by giving three months' notice, if the performance of the system or the services rendered by the supplier is not found satisfactory.
14. The "Contractor" has to submit an undertaking that it will not use IMD data for any commercial purpose.
15. This contract shall be governed in all respects by Indian Laws.

27. Vendor Qualification Criteria:

- (a) The supplier must have manufactured, tested & supplied at least one Doppler radar during the last 5 years, and the system should be in successful operation as on date of opening of bid. The bidder shall submit a certificate from the user indicating the successful operation of the radar, with contact details of user. In this regard, the required certificate as per Annexure XI furnished on the letter head by Head of the user Organization/ Department will be considered only.
- (b) The supplier shall submit a statement on his past experience in this field, with details of the type and locations of radars supplied.
- (c) Bidders who are system integrators and have recently established production line in India with transfer of technology for the product as specified in this TENDER DOCUMENT, can also be considered as meeting the criteria, provided, the parent company (principals) meets the above criteria in full and agrees to furnish either jointly with the bidder (Subsidiary) or separately a legally enforceable undertaking to guarantee quality, timely delivery, performance, warranty obligations and maintenance services, as specified. Copy of the agreement with the principals to be provided along with technical bid.
- (d) Any Indian Manufacturer who satisfies all the technical requirements of the TENDER DOCUMENT shall be eligible provided that the technology adopted by them is based on R & D efforts as evinced by documentary proofs and presently engaged in radar manufacturing.
- (e) The bidder should furnish the information on all past supplies and their satisfactory performance in the pro-forma under Annexure-VIII.

CHAPTER-3

Special Conditions of Contract (SCC)

1. Supplier can submit their bids for 11 nos of Doppler Weather Radars (7 Klystron based + 4 Solid state) or only for one type of DWR (either Klystron based or solid state type).
2. The experience of the foreign principal will also be accepted for eligibility criteria.
3. The number of Radars mentioned above is only indicative quantity. IMD may increase or decrease the numbers.
4. If few more radars required, IMD may place an additional supply order as per the same cost and terms and conditions following GFR -2017.
5. The firm shall have the manufacturing facilities in India, these facilities will be inspected by officials of IMD and ISRO team before awarding of supply order.
6. The L1 bidder(s) for the Klystron based Radar and SSPA based Radar shall be arrived at separately. Therefore two separate purchase orders for each of these class of Radars viz: Klystron and SSPA shall be issued.
7. The prime bidder must have ISO certification.
8. Technical evaluation will consist of presentation by bidder (*Presentation must include point to point details as per Schedule of Requirements and Specifications & allied Technical Details (Chapter-4) of the tender document*).
9. Technical evaluation of the two categories of the systems i.e. Klystron based and SSPA based transmitters will be done separately and supply order will be issued separately to successful bidders.
10. The firm shall submit their agreement to supply the additional systems under the same technical specification and terms and conditions to any organisation functioning under Ministry of Earth Sciences, Govt. of India, during the period of three years with effect from the date of installation and commissioning of the last radar system.

CHAPTER-4

SCHEDULE OF REQUIREMENTS AND SPECIFICATIONS & ALLIED TECHNICAL DETAILS

C-BAND DUAL POLARIZED DOPPLER WEATHER RADAR SYSTEM SPECIFICATIONS

1. GENERAL REQUIREMENT:

India Meteorological Department intends to procure 11 nos. of C-Band Dual Polarised Doppler Weather Radar Systems out of which; Seven (07) numbers of radars are with klystron based C-band dual polarised Doppler weather radar systems as per technical specification mentioned in at Table-1. Four (04) numbers are with Solid state Power Amplifier transmitter based C-band Dual Polarized Doppler Weather radar systems as mentioned at Table-2.

The specifications described herein refer to C-band (**5400-5700 MHz**) Polarimetric Doppler Weather Radar, hereafter referred to as “The System”. The System shall be capable of detecting and estimating meteorological parameters of severe weather phenomena that cause widespread damage to life and property.

- a. All the DWR systems to have following latest state of the art facilities in addition to smooth operation of complete radar system and its accessories:
 - i. 20 KVA Diesel Generator with Auto ON & OFF facility along with at least 100 L capacity fuel Tank.
 - ii. Suitable 15 KVA online UPS (Two systems for active-active redundant capability) along with batteries for at least 60 Minutes power back-up.
 - iii. GPS based NTP server for system clock time synchronisation of the radar and computers.
 - iv. Communication hardware and accessories for data transfer to central location.
 - v. The system will have dual polarimetric capability, transmitting in both linear horizontal and vertical polarizations.
 - vi. The system shall have user selectable Single polarization and Dual polarization mode of operation.
 - vii. Latest state of art computer system shall be used for the generation of data and its processing. The entire operation of the System shall be fully computer controlled and remotely manageable.

- viii. Eleven such systems are proposed to be purchased in this tender. The tentative location for installation of the systems is mentioned in Annexure-IX.
- ix. Structure for installation of entire radar system on galvanized steel tower structure will be delivered to the consignee for operation, at any selected site, shall be provided. Tower shall have electric lift reaching one floor below the antenna and radome. Appropriate cemented concrete base, leveling arrangement, networking hardware, diesel generator, UPS with batteries, fuel storage tank for generator, etc shall also be provided. Diesel generator shall have automated switching on and off feature in the event of normal electricity failure.
- x. The height of the structure shall be scalable. Nominal height each 20m with increments of 5m (max. 30 m) as per the site requirement to avoid any obstruction during scanning. For L1 computation only 20 m will be considered.
- xi. The quoted signal processors/computers and its software should be in use in any operational weather services in the world. to fulfill the functional requirements and the data products required to be generated, displayed, and archived which have been specified elsewhere in detail. At the time of supply of the store the latest state of art computer system and latest version of software shall be provided for the generation of data and it's processing, with OEM Licensed Version of Linux / Windows Operating System.
- xii. All equipment shall be of industry standard so as to enable easy up-gradation and maintenance. Manufacturer shall submit the full details of the hardware, including model numbers and the software proposed to be employed for meeting the requirements given herein.
- xiii. Central server at Delhi for processing the data from all eleven radars to be provided. Data analysis and products generation of all the sites inclusive of dissemination of warnings and alerts are to be provided by the firm. Display of data such as reflectivity, rainfall rate, accumulated rain, horizontal winds at designated height, warnings etc to be overlaid on GIS map. Access to GIS based display to be provided using internet browsers such as Microsoft Internet Explorer, Firefox, Chrome etc.
- xiv. The firm has to clearly specify the way of achieving the sensitivity & detection capability (in ref. OVERALL SYSTEM REQUIREMENTS) with supportive documents of claim and appropriate calculations for both types of transmitters.
- xv. Lightning protection is to be in place ensuring safety of the system and mounted elements by the way of grounding cable through ground bar or other best suited mechanism.
- xvi. The supplied DG Set, UPS etc, should have AMC service support facility in India.

- xvii. The antenna mount should be equipped with suitable leveling system to ensure horizontal alignment of azimuth and elevation axis. Suitable indicators / readers shall be included for confirming the antenna base alignment.
 - xviii. IMD will take possession after appropriate test and evaluation meeting the specifications and accept the radar after commissioning. It is the responsibility of the bidder to bear all the expenditure to operate the radar including manpower requirements, security and all radar peripherals till successful acceptance and commissioning.
 - xix. Transportation from the factory to the site will be the responsibility of the vendor.
 - xx. The entire work of installation and commissioning of the radar has to be carried out by the vendor, though IMD may station few of its officials at the site for guidance.
 - xxi. The network link between the systems will be provided by IMD; firm shall suggest suitable bandwidth for real time system control and monitoring; a near real-time receipt of data for generating composites of all the radars.
 - xxii. Computers and software tools for data analysis and products generation at eleven sites inclusive of dissemination of warnings and alerts are to be provided.
- b. The price bids of technically qualified firms only shall be opened for further scrutiny and evaluation on a date notified after evaluation of the techno commercial bid. .

IMD shall evaluate the price bids of technically qualified vendors for deciding lowest bidder (L-1) on the basis of total cost including cost of all the deliverables as per tender document and all prevailing taxes and duties and any other charges as demanded by the vendor including custom duty.

2. OVERALL SYSTEM REQUIREMENTS: IMD requires 11 nos. of C-Band Dual Polarimetric Doppler Weather Radar Systems out of which; Seven (07) numbers of radars are Klystron based systems as per technical specification mentioned in Table-1 and Four (04) numbers with Solid State Power Amplifier transmitter based C-band Dual Polarized Doppler Weather radar systems as mentioned in Table-2.

**TABLE-1: Technical Specification for Seven (07) numbers Klystron based
C-band Dual Polarized Doppler Weather Radar Systems**

General		
2.1	Range of observation	400 Km (Reflectivity) 250 Km (Velocity, Spectrum Width)
2.2	Range resolution	75 m or better
2.3	Max. Unambiguous Range	250km or better; consistent with PRF; 2 nd trip echo recovery necessary
2.4	Unambiguous Velocity	60 m/s or better with ambiguity resolver
2.5	Detection capability	13 dBZ or better at 250 km range
2.6	VSWR	1.25:1
2.7	Scan Time	10 elevation volume scan with all base moments acquired in 8 minutes or better
Transmitter		
2.8	Transmitter Type	Tunable Power Klystron
2.9	Frequency Range	5.4 GHz – 5.7 GHz
2.10	Transmitted power	Required to meet 13 dBz at 250 Km as per Point No.2.5.
2.11	Pulse repetition frequency	To meet Range and Velocity requirement as per Points No. 2.3 &2.4
2.12	Pulse width	0.4 to 2.0 μ Sec.
2.13	Transmitter Polarization	STAR
2.14	Modulator	Solid state
2.15	VSWR	1.25:1
Antenna, Radome & Tower		
2.16	Antenna	Parabolic Dish Antenna
2.17	Side lobe	26dB down from the main lobe to 12° and beyond 12° better than 30dB.
2.18	Beam width	1° or better
2.19	Azimuth steering	360° with $\pm 0.05^\circ$ accuracy and 0-6 rpm
2.20	Vertical Steering	-2° to +92° or better with $\pm 0.05^\circ$ accuracy
2.21	Polarization	Horizontal, Vertical and STAR mode
2.22	Scanning rates	Up to 6 rpm

2.23	Scan strategy	Provision for automatic changeover between different scan strategies shall be possible.
2.24	Radome	(1) Type: Rigid spherical in shape (curved panels) Installed on galvanized steel tower, covering antenna dish and pedestal, with adequate space for maintenance personnel to enter and work. (2) Transmission Loss : better than 0.2dB one way
2.25	Wind load	Up to 130 km/hr and in gusting condition up to 230 km/hr
2.26	Lightening Protection	Lightening rod with dual ground wires.
2.27	Obstruction lights	Twin Light System with solar powered & auto switch with long life lamps. Roof hatch for maintenance of obstruction lights and entry from bottom; suitable portable ladder for the purpose of maintenance.
2.28	Tower height	20m nominal with quotes for additional height for every 5 meter. Tower installation will be required where IMD radar buildings are not existing <u>L1-will be evaluated on the basis of 20m tower height</u>
Receiver		
2.29	Type	Multichannel Digital receiver for Dual Polarization (H&V), STAR mode operation
2.30	Noise figure	3 dB or better
2.31	Linear dynamic range	95 dB or better
2.32	Minimum Discernable Signal	-110dBm or better
Radar Signal Processor		
2.33	Doppler processing	Pulse Pair and FFT selectable
2.34	Clutter suppression	Clutter Elimination for >45 dB. The system shall have provision for identifying and filtering non-meteorological echoes such as, Sea clutters, bird/insects, chaffs, etc. based on polarimetric measurements.

2.35	Parameters to be measured and displayed	<p>a) Reflectivity (Z_H) Dynamic range : -30 to 65 dBZ Resolution : 0.1 dB Accuracy : $\leq 1\text{dB @ SNR} > 10\text{dB}$; $r < 230\text{Km}$; $\Delta r < 1\text{Km}$</p> <p>b) Radial velocity (V_H) Max : $\pm 30\text{m/s}$ Resolution : 0.1 m/s Accuracy : $\leq 1\text{ m/s @SNR} > 10\text{dB}$; $\sigma_v = 4\text{ m/s}$; $r = 125\text{ Km}$; $\Delta r < 250\text{m}$</p> <p>c) Spectrum Width (σ_H) Max : $\pm 15\text{m/s}$ Resolution : 0.1 m/s Accuracy : $\leq 2\text{ m/s @SNR} > 10\text{dB}$; $\sigma_v = 4\text{ m/s}$; $r = 125\text{ Km}$; $\Delta r < 250\text{m}$</p> <p>d) Differential reflectivity (Z_{DR}) Dynamic range : -5 to 8 dBZ Resolution : 0.1 dB Accuracy : $\leq 0.2\text{dB @ SNR} > 10\text{dB}$; $r < 125\text{Km}$; $\Delta r < 1\text{Km}$</p> <p>e) Differential phase (Φ_{DP}) Dynamic range: -180 to 180 deg Resolution : 0.1 deg Accuracy : $\leq 2\text{deg @ SNR} > 10\text{dB}$; $r < 125\text{Km}$; $\Delta r < 1\text{Km}$</p> <p>f) Correlation Coefficient at zero lag (ρ_{HV}) Dynamic range : 0 to 1 Resolution : 0.005 Accuracy: $\leq 0.05 @ \text{SNR} > 10\text{dB}$; $r < 125\text{Km}$; $\Delta r < 1\text{Km}$</p>
2.36	Calibration	<p>(I) Provision shall be made for programmable and auto run for absolute internal calibration to ensure reliability of polarimetric parameters at frequent intervals and display the current values to maintain the system health and accuracy of the product.</p> <p>(II) An external calibration through standard external equipment and validation of receiver linearity and dynamic range using standard coherent source and standard measuring equipment. There should be a provision for automatic update of radar parameters. The calibration set up should be part of the deliverables.</p> <ol style="list-style-type: none"> Receiver single point calibration in long and short pulse mode Transmitter peak power System noise figure
2.37	Sun calibration	<p>Software driven and manual mode operation for verifying pointing accuracy 0.1 degree. The system shall be made to point</p>

		towards sun for establishing the gain and pointing accuracy of the antenna; stability and reliability of receiver chain using solar flux (sun) values known from other sources. Procedure shall be provided and to be demonstrated during SAT. Script based execution of such measurements and saving of results are expected as a part of such provision.
2.38	Base Parameters to be measured	<ul style="list-style-type: none"> a. Reflectivity (Z), b. Radial velocity (V), c. Spectrum Width (σ), d. Differential reflectivity(Z_{DR}), e. Specific differential phase (K_{DP}), f. Differential phase (Φ_{DP}), g. Cross correlation and Coefficient (ρ_{HV}) h. Linear Depolarization Ratio (L_{DR})
2.39	Peripherals:	<ul style="list-style-type: none"> a) Two Workstations in active-active configuration of latest suitable computer configuration at the time of delivery in terms of mother board chipset, Processor, processor speed, RAM size and speed, Ethernet speed/usb speed, VGA/DVI card memory and hard disk storage with 32" (inches) Full HD resolution, color LED monitor. Both Workstations shall be used for operation, control of the radar; product generation and display of the data and shall have Raid Storage of the data to avoid any loss of data. b) Two workstations in active-active configuration with latest configuration at the time of delivery in terms of mother board chipset, Processor, processor speed, RAM size and speed, Ethernet speed/usb speed, VGA/DVI card memory and hard disk storage processor with 32" (inches) full Hd resolution, color LED monitor. Both Workstations shall be used for networking/communication purpose. c) One portable computer (laptop) of latest version/ configuration, capable of handling functions of (a) & (b). d) One 55" (inches) UHD 4k LED display. e) One desktop computer of latest configuration processor at the time of delivery for monitoring of radar and data products. f) NAS storage with RAID with archival for 05 years of data. g) Provision for recording and playback of offline data as well as storage of I&Q data. h) Provision for remote radar control, monitoring and operations. i) All software license shall be multiuser and open, within radar group without any restriction/hardware lock / soft- lock.

Power Requirements		
2.40	Power	Capable of operating at 220±10% V, 50 ±2%Hz, in Single phase and 400V ±10% V, 50 ±2% Hz in Three phase.
2.41	Online UPS	Two UPS, in redundant mode and each capacity of 15 KVA on line UPS along with changeover facility for switching to standby UPS, to run the whole radar system for at least 60 minutes. Catering to required voltage stabilization with a power factor suitable for the system.
2.42	Diesel Generator	At least 20 KVA Suitable Diesel Generator Set with AMF panel for automatic turn ON when mains fails and capable to take up the load (of all the essential components and accessories of the Radar system required for operation). The DG set should be silent with a separate canopy operable in all weather conditions.
2.43	Enclosure	A double storey well-furnished porta cabin- size 20 X 20 feet is required to meet all operational requirements which includes operational room, Radar Officer room, UPS, stores, Kitchenette, Rest room, Washroom along with ACs, water cooler, RO, furniture and separate outside canopy housing for D.G. set etc. to make it convenient for operational staff to work round the clock as per Annexure-XII. The size of porta cabin may vary in size from location to location.

TABLE-2: Technical Specification for Four (04) numbers Solid State Power Amplifier based C-band Dual Polarized Doppler Weather Radar Systems

General		
2.1	Range of observation	400 Km (Reflectivity) 250 Km (Velocity, Spectrum Width)
2.2	Range resolution	75 m or better
2.3	Max. Unambiguous Range	250km or better; consistent with PRF; 2 nd trip echo recovery necessary
2.4	Unambiguous Velocity	60 m/s or better with ambiguity resolver
2.5	Detection capability	13 dBZ or better at 250 km range
2.6	VSWR	1.25:1
2.7	Scan Time	10 elevation volume scan with all base moments acquired in 8 minutes or better
Transmitter		
2.8	Transmitter Type	Tunable Power Solid State Power Amplifier based system
2.9	Frequency Range	5.4 GHz – 5.7 GHz

2.10	Transmitted power	Required to meet 13 dBz at 250 Km as per Point No.2.5.
2.11	Pulse repetition frequency	To meet Range and Velocity requirement as per Points No. 2.3 &2.4
2.12	Pulse width	SSPA based system to meet the average power at variable pulse of transmissions at different carrier frequencies as per 2.5 (Range side lobes better than 35dB)
2.13	Transmitter Polarization	STAR
2.14	Modulator	Solid state
2.15	VSWR	1.25:1
Antenna, Radome & Tower		
2.16	Antenna	Parabolic Dish Antenna
2.17	Side lobe	26dB down from the main lobe to 12° and beyond 12° better than 30dB.
2.18	Beam width	1° or better
2.19	Azimuth steering	360° with ±0.05° accuracy and 0-6 rpm
2.20	Vertical Steering	-2° to +92° or better with ±0.05° accuracy
2.21	Polarization	Horizontal, Vertical and STAR mode
2.22	Scanning rates	Up to 6 rpm
2.23	Scan strategy	Provision for automatic changeover between different scan strategies shall be possible.
2.24	Radome	(1) Type: Rigid spherical in shape (curved panels) Installed on galvanized steel Tower covering antenna dish and pedestal, with adequate space for maintenance personnel to enter and work. (2) Transmission Loss : 0.15dB one way
2.25	Wind load	Up to 150 km/hr and in gusting condition up to 200 km/hr
2.26	Lightening Protection	Lightening rod with dual ground wires.
2.27	Obstruction lights	Twin Light System with solar powered & auto switch with long life lamps. Roof hatch for maintenance of obstruction lights and entry from bottom; suitable portable ladder for the purpose of maintenance.
2.28	Tower height	20m nominal with quotes for additional height for every 5 meter. Tower installation will be required where IMD radar buildings are not existing <u>L1-will be evaluated on the basis of 20m tower height</u>
2.29		
2.29	Type	Multichannel Digital receiver for Dual Polarization (H&V), STAR mode operation
2.30	Noise figure	3 dB or better

2.31	Linear dynamic range	95dB or better
2.32	Minimum Discernable Signal	-110dBm or better
Radar Signal Processor		
2.33	Doppler processing	Pulse Pair and FFT selectable
2.34	Clutter suppression	Clutter Elimination for >45 dB. The system shall have provision for identifying and filtering non-meteorological echoes such as anomalous propagation echoes, Sea clutters, bird/insects, chaffs, etc. based on polarimetric measurements.
2.35	Parameters to be measured and displayed	<p>(a) Reflectivity (Z_H)</p> <ul style="list-style-type: none"> •Dynamic range : -30 to 65 dBZ •Resolution : 0.1 dB Accuracy : $\leq 1\text{dB}$ @ SNR>10dB ; r<230Km; Δr<1Km <p>(b) Radial velocity (V_H)</p> <ul style="list-style-type: none"> •Max : $\pm 30\text{m/s}$ •Resolution : 0.1 m/s Accuracy : $\leq 1\text{ m/s}$ @SNR >10dB; $\sigma_v=4\text{ m/s}$; r= 125 Km; Δr<250m <p>(c) Spectrum Width (σ_H)</p> <ul style="list-style-type: none"> •Max : $\pm 15\text{m/s}$ •Resolution : 0.1 m/s Accuracy : $\leq 2\text{ m/s}$ @SNR >10dB; $\sigma_v=4\text{ m/s}$; r= 125 Km; Δr<250m <p>(d) Differential reflectivity(Z_{DR})</p> <ul style="list-style-type: none"> •Dynamic range : -5 to 8 dBZ •Resolution : 0.1 Db Accuracy : $\leq 0.2\text{dB}$ @ SNR>10dB ; r<125Km; Δr<1Km <p>(e) Differential phase (Φ_{DP})</p> <ul style="list-style-type: none"> •Dynamic range : -180 to 180 deg •Resolution : 0.1 deg Accuracy : $\leq 2\text{deg}$ @ SNR>10dB; r<125Km; Δr<1Km <p>(f) Correlation Coefficient at zero lag (ρ_{HV})</p> <ul style="list-style-type: none"> •Dynamic range : 0 to 1 •Resolution : 0.005 Accuracy : ≤ 0.05 @ SNR > 10dB; r<125Km; Δr<1Km
2.36	Calibration	<p>(I) Provision shall be made for programmable and auto run for absolute internal calibration to ensure reliability of polarimetric parameters at least once every volume scan cycle and display the current values to maintain the system health and accuracy of the product.</p> <p>(II) An external calibration through standard external equipment and validation of receiver linearity and dynamic range using standard coherent</p>

		<p>source and standard measuring equipment. There should be a provision for automatic update of radar parameters.</p> <p>a. Receiver single point calibration in long and short pulse mode</p> <p>b. Transmitter peak power</p> <p>c. System noise figure</p>
2.37	Sun calibration	<p>Sun calibration in both software driven and manual mode operation for pointing accuracy 0.1°. The system shall be made to point towards sun for establishing the gain and pointing accuracy of the antenna; stability and reliability of receiver chain using solar flux (sun) values known from other sources. Procedure shall be provided and to be demonstrated during SAT. Script based execution of such measurements and saving of results are expected as a part of such provision.</p>
2.38	Base Parameters to be measured	<p>a. Reflectivity (Z),</p> <p>b. Radial velocity (V),</p> <p>c. Spectrum Width (σ),</p> <p>d. Differential reflectivity (Z_{DR}),</p> <p>e. Specific differential phase (K_{DP}),</p> <p>f. Differential phase (Φ_{DP}),</p> <p>g. Cross correlation and Coefficient (ρ_{HV})</p> <p>h. Linear Depolarization Ratio (L_{DR})</p>
2.39	Peripherals	<p>a) Two Workstations (Main & Standby) of latest computer configuration at the time of delivery in terms of mother board chipset, Processor, processor speed, RAM size and speed, Ethernet speed/usb speed, VGA/DVI card memory and hard disk storage with 32" (inches) full HD resolution, color LED monitor. Both Workstations shall be used for operation, control of the radar; product generation and display of the data and shall have Raid Storage of the data to avoid any loss of data.</p> <p>b) Two workstations in redundant setup of latest configuration at the time of delivery in terms of mother board chipset, Processor, processor speed, RAM size and speed, Ethernet speed/usb speed, VGA/DVI card memory and hard disk storage processor with 32" (inches) full HD resolution, color LED monitor. Both Workstations shall be used for networking/communication purpose.</p> <p>c) One portable computer (laptop) of latest version/ configuration, capable of handling functions of (a) & (b).</p> <p>d) One 55" (inches) UHD 4k LED display.</p> <p>e) One desktop computer of latest configuration processor at the time of delivery for monitoring of radar and data products.</p> <p>f) NAS storage with RAID with archival for 05 years of data.</p> <p>g) Provision for recording and playback of offline data as well as storage of I&Q data.</p>

		h) Provision for remote radar control, monitoring and operations. i) All software license shall be multi user and open, within radar group without any restriction/hardware lock / soft- lock.
Power Requirements		
2.40	Power	Capable of operating at 220±10% V, 50 ±2%Hz,in Single phase and 400V ±10% V, 50 ±2% Hz in Three phase.
2.41	Online UPS	Two UPS, in redundant mode and each capacity of 15 KVA on line UPS to run the whole radar system for at least 60 minutes. Catering to required voltage stabilization with a power factor suitable for the radar system.
2.42	Diesel Generator	At least 20 KVA Suitable Diesel Generator Set with AMF panel for automatic turn ON when mains fails and capable to takes up the load (of all the essential components and accessories of the Radar system required for operation). The DG set should be silent with a separate canopy operatable in all weather conditions.
2.43	Enclosure	A double storey well-furnished porta cabin- size 20 X 20 feet is required to meet all operational requirements which includes operational room, Radar Officer room, UPS, stores, Kitchenette, Rest room, Washroom along with ACs, water cooler, RO, furniture and separate outside canopy housing for D.G. set etc. to make it convenient for operational staff to work round the clock as per Annexure-XII. The size of porta cabin may vary in size from location to location.

List of deliverable for installation of eleven C-Band Dual Polarimetric Doppler Radars attached vide **Annexure-VII-A** (FOR DELIVERABLES FOR SUPPLY OF 07 Nos. KLYSTRON BASED C-BAND DUAL POL. DOPPLER WEATHER RADARS) & **Annexure-VII-B** (FOR DELIVERABLES FOR SUPPLY OF 04 Nos. SOLID STATE POWER AMPLIFIER BASED C-BAND DUAL POL. DOPPLER WEATHER RADARS).

3. ARCHIVAL OF RADAR DATA:

- a. The base data which includes Reflectivity, Velocity, Spectrum Width and Dual Pol. Parameters (output of radar processor) shall be stored automatically on hard disk. Network Attached Storage on RAID 5 with a usable capacity of 10 TB based on SAS disk to be provided for archival of Base Parameters data
- b. A-4 size high resolution Laser Color Printer (20ppm, 600dpi) for taking hard copies of images and products shall be provided.
- c. External Blue ray DVD writer with 12 disks of dual layer Blue ray DVD R/W and 50 disks of Blue Ray DVD/R at each site to be provided.
- d. Provision to record, store and offline playback for analysis of I& Q data.

4. DATA FORMATS:

4.1 Digital Data

- a) System should be capable of archiving of raw data (I & Q) and generating Polarimetric Doppler Weather Radar Base data and products in BUFR, NETCDF, GRIB2, HDF5, KML, KMZ formats and NEXRAD-Level II formats.
- b) Stand-alone BUFR, NETCDF, HDF5, GRIB2, NexRAD-Level II encoding and decoding software on Licensed Linux/MS-WINDOWS platform should be provided. The software should be able to convert the radar data to formats as per user requirements and IMD specifications mentioned at 4.1(a) above.
- c) NetCDF format data shall be provided in NCAR CFRadial, and IMD-NetCDF format. Details of IMD-NetCDF format and BUFR-OPERA format file as required by IMD shall be provided to successful bidder for developing software applications.
- d) The successful bidder shall provide all technical support during the concurrency of this contract as per IMD requirement for ingest of base product to an independent weather radar data analysis software which IMD may develop in future.
- e) Existing central server system at IMD HQ, New Delhi is based on Vaisala (SIGMET) IRIS software for centrally generating various products including mosaic and various data formats from RAW data. The successful bidder should provide necessary provision to ingest their radar data in a compatible format for use with already available central server at New Delhi.
- f) Data format if proprietary should be disclosed with software codes.
- g) The successful bidder shall provide Raw Data format as well as products conversion to ASCII.

4.2 Image data

The system should be capable of generating images (JPEG, GIF, TIFF, PNG) files for publishing on web site. Images should have high resolution to meet full HD displays and also for web pages. Following file naming conventions are to be implemented for generating images after completion of each volume scan.

- | | | | |
|----|-------------|-------|------------------------------------|
| a) | caz_stn.gif | Max Z | 250 kms range |
| b) | ppz_stn.gif | PPI Z | 500 kms |
| c) | ppi_stn.gif | PPI Z | 250 kms |
| d) | ppv_stn.gif | PPI V | 250 kms |
| e) | vp2_stn.gif | VVP | |
| f) | sri_stn.gif | SRI | 150kms |
| g) | pac_stn.gif | PAC | 150 kms accumulated rain for 24hrs |

5. PRODUCT GENERATION:

The radar system should be having required menu driven software with GUI controls for:

- a. Operating the radar.
- b. Setup of operational scan parameters.
- c. Configuration of weather products.
- d. Generation of alerts and warning,
- e. Setup of communication channels.
- f. Setup of display overlaid on map of India with political boundaries of international borders, states and district boundaries.
- g. Automatic calibration for antenna, receiver, dynamic range, etc.
- h. Monitoring the health of the radar using BITE.
- i. The process of setup/change of various scan parameters should be easily accessible to operators using GUI.
- j. Product generation.
- k. Product display.
- l. Generation of audio-visual warnings based on user defined thresholds for severe weather detection.
- m. Automatic transmission of warnings (visual and text) to users via communication channels.
- n. Facility to reprocess and display products from past data.
- o. Simultaneous display of data having more than one parameter.
- p. Requisite software protection for denying unauthorized access to be provided.
- q. The system shall perform optimized correction of reflectivity data for attenuation effects from heavy rain based on algorithm using polarimetric parameters such as ZDR , Φ_{DP} , K_{DP} and ρ_{HV} .

The System shall be capable of generating the following products from the base data output from the radar signal processor. Algorithms and references for all the products listed below and supplied should be provided.

5.1 Base Products

- a) The un-filtered I & Q data archival and playback facility to generate base products.
- b) The system shall generate base data comprising for Z , V , σ and Polarimetric products after applying different corrections to raw data (like attenuation effect due to precipitation, earth curvature, range normalization, beam blockage, interference due to external sources, non-meteorological echoes, second-trip recovery, ground reflection, bright band correction, etc.)
- c) Products are to be generated based on user defined parameters already selected and stored in workstation and NAS against the various scan schedules.
- d) Provision also should be available to generate all products in offline mode using the archived raw data.

5.2 Primary Products

5.2.1 Maximum Display

The System shall compute and display maximum values of base data products (Z , V and σ) in horizontal (East west and North South) and vertical columns between users defined heights and also display the partial images in a single frame with side panel heights to a resolution of 2km covering 0 -18 km

5.2.2 CAPPI (Constant Altitude Plan Position Indicator)

The System shall interpolate from the volume scan data set for a geo-horizontal plane at user vertical defined height and display the same pertaining to user selectable data form Z , V and σ .

5.2.3 PCAPPI (PSEUDO CAPPI)

The system shall incorporate data form the highest elevation scan near the radar and from lowest elevation scan for areas at far away from the radar for which radar beams are not intersected by user defined plane for CAPPI and display same pertaining to data selected by user.

5.2.4 VCUT (Vertical Cut)

The system shall interpolate all the base products (Z , V and σ) in any vertical plane passing through user defined two points and display the same for the user selectable parameters.

5.2.5 EBASE (ECHO BASE)

The system shall identify from the volume scan data the minimum height up to which the user defined threshold value for each base data exists and display them for user selectable data.

5.2.6 ETOP (ECHO TOP)

The system shall identify from the volume scan data the maximum height up to which the user defined threshold value for each base data exists and display them for user selectable data.

5.2.7 HAIL WARNING

Based on reliable hail warning algorithm, the system shall generate a hail warning symbol at the appropriate place in the PPI display in one or more of the operator chosen fields.

5.2.8 HYDROMETEOR CLASSIFICATION

The system shall be capable of generating a product for Hydrometeor Classification of hydrometeors based on Polarimetric parameters (Z_{DR} , Φ_{DP} , K_{DP} and ρ_{HV}). Provision for changing parameters in a scientific way for customization of the hydrometeor classification is a requirement. Hail detection based on this classification shall be one of the products in this class.

5.3 Derived Meteorological Products:

5.3.1 Velocity Products

The system shall generate and display following velocity products:

- a. Radial velocity versus the azimuth for a fixed elevation and a fixed slant range (VAD).
- b. Radial velocity at a fixed user defined range on height and azimuth angles (Radial velocity display for fixed range, azimuth angles for various height and azimuth).
- c. Horizontal wind velocity and wind direction using barbs in a vertical column above the radar site for different heights including divergence & convergence product.
- d. Horizontal wind vectors (UWT) using barbs at user defined layer height with or without underlay of reflectivity or velocity in PPI / CAPPI format.

5.3.2 Hydrological Products:

The system shall generate and display following hydrological products:

- a. Rainfall intensity using polarimetric moments as well as Z-R in a user selectable surface layer and constants with constant height above ground. Provision of specifying freezing layer height dynamically.
- b. Instantaneous estimation of water content (VIL) residing in a user defined atmosphere layer in the atmosphere to be displayed in PPI type of display.
- c. Precipitation accumulation (PAC) using polarimetric and Z-R in a user definable time period.
- d. Rainfall amount in user defined catchment basins for user defined time span.
- e. Provision for putting river basin map overlay as per user requirement.
- f. Rainfall intensity, rainfall rate and accumulation products shall have an option to be adjusted in real time by Rain Gauge, Automatic Weather Station or disdrometer data. Rain gauge and disdrometer data shall be displayed along with the radar data.
- g. Adjustment of rainfall rate by appropriate rain gauge or disdrometer data shall be possible.
- h. The system shall convert data of reflectivity and polarimetric measurement to horizontal maps of rainfall intensity.
- i. The system shall be capable of generating precise rain rate information using combination of polarimetric parameters as well as Z(h)
- j. The system shall use algorithm based on polarimetric parameters for correcting rain rate estimation errors arising out of hail, non-meteorological echoes and attenuation.
- k. Google Earth integration of gridded rainfall products.
- l. Provision for generation of composite maps of rainfall.

5.3.3 Aviation Products

- a. The system shall evaluate derivatives of wind velocity in radial, azimuth, elevation, North South, East West directions and derive horizontal, vertical and three dimensional shears
- b. The system shall also be able to generate warning product on microburst, meso-cyclones and wind shears beyond adaptable threshold levels.
- c. The system shall evaluate maximum turbulence within user defined atmospheric layer and display in top view.

5.3.4 Warning and Forecasting Products.

- a. System shall generate and display warning symbols for thunderstorm, hail storm, dust storm, meso-cyclone, convergence, divergence and gust fronts. The forecast of probable places of likely hood , their track, etc using a reliable algorithms.
- b. System shall be capable of evaluating speed and direction of movement of weather systems.
- c. System shall also be capable of warning if any of the conditions defined by the user are reached or fulfilled on reflectivity, velocity, VIL, rainfall intensity, rainfall accumulation and wind shear.
- d. System shall be able to detect tornado and gust fronts associated with storms and issue visual and text warning message.
- e. System has to generate a storm relative velocity product e.g. PPI, PCAPPI removing the bias of storm motion velocity.
- f. TITAN software running in real time should be available with appropriate data intake.
- g. Storm Relative Helicity Product

NOTE: Detailed algorithm for generation of the above products as well as limitations of each product will be discussed and finalizes with IMD officials during design review with the successful bidder..

5.4 Alphanumeric Products

The system shall also be able to provide all the product data (i.e. base, primary and derived) in tabular form for ingesting these data in to numeric models for weather predictions.

6. Built In Test Equipment (BITE).

A modern system making use of latest technology for continuous monitoring of the operational status of hardware and software functions and utilities of the radar system shall be supplied.

BITE processor shall measure and process a number of real time analog and digital parameters in the radar system and generate and display the error message whenever their value falls outside the specified permissible range. BITE processor shall continuously monitor input and output signals of every module/PCB for any deviation from the standard values. Whenever any error message is generated, BITE processor shall also hierarchically indicate failure from equipment, way down to PCB and sub module level. Audio alarm indication for occurrences of faults is to be provided.

Testing of major modules shall be made available without interlinking the demand of another module working status.

7. Provision for Networking & Communication system for data transfer to central location:

Provision shall be made with suitable communication hardware & software for real time transfer of digital radar data and images through networking to control and monitoring centre in respective state and central server System installed at IMD HQ, New Delhi.. All networking components required at radar site as well as command and control centre shall be provided by the supplier. Necessary interface shall be provided for sending radar data through GSM, VPN and internet. These centres should be able to monitor and control the functions of the radar. Data from respective radars under each centre will be utilized for real time display facility for monitoring the health parameters as well as the weather data acquired by radars in operational mode. The communication link will be provided by IMD. The supplier shall specify the bandwidth requirement. Deliverables for control and command centres are to be provided as per Annexure-II.

The radar data is to be converted in a compatible format for use with already available central server of the existing Doppler weather radar network of IMD based on IRIS (SIGMET) software of M/S Vaisala.

Data of all radars to be overlaid on GIS map with option to select underlay map from google, Bhuvan or open street map or ESRI, Arc GIS Boundary of states will be provided by IMD in shape files.

The Products which are to be overlaid are:

- a. Reflectivity
- b. Rainfall
- c. Warnings based on Rainfall, Velocity, Hydrometeor Classification.

GIS server using open street map may be provided.

8. INSTALLATION:

All installation related work including civil work shall be carried out by the supplier. However, IMD personnel shall be associated with the installation process. All installation materials required shall be supplied by the firm.

The supplier shall take into consideration that the system is required to be installed on site on a nominal tower height 20m upon which radar antenna and radome shall be installed. Towers should be able to take the dynamic load of the radar system and its accessories while in operation, (with due consideration for the gusty wind load) shall be erected by the supplier.

A ground level cabin/shelter with proper cooling for regular operation including for DG/ UPS/ etc. to be provided by the firm and shall also have minimum space for office work. Minimum space required should be clearly indicated.

Walk/inspection space of about a meter width all around the radome base with a safety railing of 1.5m height is recommended for servicing of Radom.

The entire responsibility of civil construction/site preparedness for installation of the radar and its peripherals shall be the responsibility of the firm.

Pre requisite for both civil & electrical requirements for installation of radar be clearly mentioned separately, inclusive of suitable diagrams of antenna & radome installations, along with the technical bid.

The required no. of electrical earthing based on latest technology i.e. Chemical Gel Earthing is required for various peripherals inclusive of radar, has to be provided by the supplier.

Suitable Lightning Arresters for protecting the radar with reliable lightning protection system with deep chemical gel and copper plate based earth pit shall be carried out by the firm.

Aviation warning indicator lamps shall be supplied and installed by the firm on the top of the antenna/radome at appropriate height.

All other requirements such as power and communication facility etc. will be arranged by IMD for enabling tower construction and installation/ commissioning of radars of each respective site.

9. LOCATION:

The list of tentative sites for installation of 11 C-Band Dual Polarized Doppler Weather Radars is attached vides List-1 & List-2 at Annexure-IX.

10. TESTING AND ACCEPTANCE:

- a. The supplier shall submit detailed test plans for Factory Acceptance Testing (FAT) prior to shipment and Site Acceptance Test (SAT) after installation at site for system acceptance. The test plan shall require concurrence by the IMD.

- b. The objective of the tests shall be the verification of performance of the system as per the specifications and functional requirements as per TENDER DOCUMENT.
- c. As per the mutually agreed test procedures, FAT shall be carried out at the supplier's premises (Buyer may waive off this condition) prior to shipment. The equipment shall be shipped only after satisfactory conclusion of the pre-shipment acceptance testing (FAT).
- d. As per the mutually agreed test procedures, acceptance test should be carried out at each radar site after installation. The supplier shall arrange for necessary test equipment.
- e. Any defects / deviations noticed during the site acceptance tests shall be rectified within a maximum period of one month from the completion of the tests. After such rectification, the tests shall be repeated to verify the rectification.
- f. Within 30 days of installation of each system, the supplier should secure acceptance of the radar and its peripherals as a whole system.

11. SYSTEM COMMISSIONING:

After the satisfactory completion of the site acceptance tests, the supplier shall demonstrate the reliabilities and capability of the system to be operated continuously and satisfactorily for a period of 15 days endurance test of the complete radar system, after which it will be said to be commissioned.

12. WARRANTY:

- a. Warranty shall remain valid for three years after the system has been commissioned and accepted by the purchaser as per terms of the contract. The warranty shall also include all third party bought out items / subsystems including Tower, Computers, Generator Set and UPS, etc. OEM certification of warranty for the third party items is to be provided.
- b. This warranty clause is applicable at individual radar sites.
- c. Upon receipt of notice about faults, the supplier shall repair or replace the defective goods or parts thereof, free of cost, at the site.
- d. The supplier shall take over the replaced parts/ goods after providing their replacements and no claim, whatsoever shall lie on the purchaser for such replaced parts/ goods thereafter.
- e. The firm shall supply the software updates, if any, during the warranty and CAMC period, free of cost.
- f. Supplier shall ensure 95% of 365 days annual-uptime.

- g. If the supplier, could not meet the 95% annual-uptime (calculated Quarterly at the time of payments) and there is a failure of the system for more than the criteria stipulated then a penalty amount of 0.5% of the total equipment cost per day for that radar, for days it is down, will be deducted from the performance guarantee amount, subject to an upper ceiling of 10% of the total equipment cost. Furthermore the purchaser may proceed to take such remedial action(s) as deemed fit by the purchaser, at the risk and expense of the supplier and without prejudice to other contractual rights and remedies, which the purchaser may have against the supplier.
- h. Maximum two weeks shutdown for Annual maintenance shall not come under the clause. Delay due to external factors and natural calamity beyond human control will be exempted.
- i. During warranty period, the supplier is required to visit consignee's site at least once in four months commencing from the date of acceptance at site for preventive maintenance, calibration and various types of checks of the goods/ equipment and a detailed report consisting of all test procedure values etc. must be submitted at UAID, New Delhi along with satisfactory certification by the UAID (IMD).

13. TRAINING:

The supplier shall provide training in operation, maintenance, calibration and fault identification of the radar system along with modification & up-gradation in application software to 3 persons from IMD, for a period of 3 weeks at factory site in India. The training shall also include lectures on the system design, computer hardware/software, operation and such other aspects which are considered essential for optimum utilization of the radar system. Onsite training in operations and first level fault identification to be provided for a period of five working days.

14. DOCUMENTATION:

- a. The supplier shall furnish two copies of the following documentation in well-bound sets/volumes of good print quality for each radar site and two copies of the same to Radar Unit, UAID, New Delhi. Soft copy of all the manuals should also be provided along with hard copy.
- b. All standard manuals, technical data sheets and other pertinent information of functional, electrical, and mechanical modules used in the System shall be included in the manuals.
- c. Interface connectivity document has to be provided for hardware as well as software interfaces.
- d. Detailed documentation of all the proprietary data formats, bit-by-bit information on the header and data patterns should be provided. Free updates made to firmware, processing

software and clarifications should also be supplied with relevant documentation during the period of warranty and CAMC thereof.

- e. The system functional block diagram shall be laid out so that a user can readily understand and identify the major functions of the system.
- f. The operating instructions shall include routine procedures, safety and emergency procedures as applicable. These instructions shall include switch-on, standby, normal operating procedures and switch off procedures. The sequence of turn-on procedures shall be optimized and shall account for controls at different physical locations. The instructions shall provide assistance to an operator to use the System for optimum performance. Sufficient illustrations shall be included to identify and locate all operating controls and indicating devices.
- g. Layout and Schematic Assembly Drawings: Schematic Diagrams of all assemblies, modules shall be provided.
- h. Parts List: Detailed parts list with part numbers shall be provided. It shall contain each and every item, mechanical, electrical, etc. used in the System.
- i. Algorithm of Products: The algorithms used in product generation shall be supplied.
- j. It shall be the responsibility of the supplier to provide detailed parts list of modules sourced. List of items imported and incorporated in the system should also be provided separately. Only such items may be used in the system whose technical details are made available by the manufacturer

15. DELIVERY SCHEDULE:

- a. Preliminary design review will be held after one month from the date of issue of supply order where in the design of hardware & software to be delivered as part of the system will be discussed.
- b. Critical design review will be conducted within six months from the date of issue of supply order where in the design along with performance parameters of the sub units will be discussed in detail to ensure that the system achieves the performance parameters to be delivered as per TENDER DOCUMENT.
- c. First radar to be installed and commissioned within 15 months from the date of issue of supply order. Rest of the radar systems shall be delivered, installed and commissioned within 36 months from the date of issue of supply order in a staggered manner i.e. each radar to be commissioned at the interval of 2 months over a period of 21 months. In this regard the firm will submit the actual schedule along with time line for execution of installation and commissioning work for each radar.

16. COMPLIANCE STATEMENT:

The supplier shall submit detail para-wise compliance statement in tabular form giving full details of each parameter along with reasons for compliance/non-compliance, if any. The

supplier shall also submit the details of references, reports etc. for each compliance giving name of technical manual, chapter number, page number and para and shall provide a copy of referred documents along with the technical bid. Silence on any para or simply making a statement 'complied' without proper justification or reference will be considered as non-compliance. Also all the claims with respect to any specification shall be supported by document along with bid document otherwise same may be treated as non-compliance. Compliance matrix should be filled in at all points of TENDER DOCUMENT individually. All pages should be signed.

17. VENDOR QUALIFICATION CRITERIA:

As per Clause 27, Page No. 20

18. COMPREHENSIVE ANNUAL MAINTENANCE CONTRACT (CAMC):

The firm shall quote for comprehensive AMC for seven years subsequent to completion of warranty period. The firm shall submit the year wise lump sum amount of CAMC charges. The amount charged for CAMC shall not be quoted as percentage of the tender cost / cost of equipment. The CAMC charges shall be included for price comparison. The terms & conditions for the CAMC are enclosed at Annexure –VI.

CHAPTER-5

PRICE SCHEDULE (Financial Bid format)

S.N	Name of Item/Store	Quantity	Make & Model	Base price	Applicable taxes & duties	Unit Price 5+6	Total price (3x7)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Store Components (hardware &Software etc.)							
Services components							

Total Tender price in figure:

And in words:

Note/instruction:

1. The bidder shall use their own letter head for quoting the prices. Document should be signed and stamped on all the pages.
2. Price shall be preferred in the format for deliverables for stores & services as given at Annexure VII A & VII B.
3. The names of each stores/items offered in technical proposal must be mentioned with make & Model including services etc if any. The deliverables list attached with financial bid must be exactly same as per the technical bids.
4. Charges, if any, for inland (within the India) Transportation /freight/insurance of stores shall be mentioned. In case not mentioned, it is treated as free of cost.
5. If there is a discrepancy between the unit price and total price THE UNIT PRICE shall prevail.
6. All applicable taxes must be mentioned against each item. Rate of each applicable tax must be mentioned in price bid. If taxes not mentioned, then it is treated that price quoted is inclusive of taxes.
7. Costing for each and every items and sub items which is offered in technical bid shall be done with all breakups. Charges for FAT, trainings, installation, SAT and other services etc. are to be mentioned clearly in price bid.
8. Price Bid (in .pdf format excluding note/instruction) shall be uploaded on eprocure.gov.in

Signature of Bidder

Seal of the Bidder

CHAPTER-6

OTHER STANDARD FORMS

Annexure-I

CHECKLIST

S.N	Activity	Compliance Yes/ No/ NA	Page & Para No. of the bid Document
1.	Registration certificate of the Firm with any state or central government body of India is attached with technical bid?		
2.	Is DD enclosed for tender fee?		
3.	Have you enclosed Earnest Money Deposit (EMD) (Bank Guarantee /FDR) of required amount? (as per Annexure-III)		
4.	Is the EMD submitted by the firm other than participating firm? If yes, then bid is likely to be ignored.		
5.	Is Registration certificate from NSIC/Government bodies on SSI attached for relaxation of EMD?		
6.	Is validity of EMD kept for 240 days?		
7.	Have you kept validity of your bid as per the TE document?		
8.	Have you enclosed Tender Terms & Conditions Acceptance Form duly filled and signed (i.e. terms and conditions are acceptable) ? (as per Annexure-II)		
9.	Tenders may be ignored if not signed.		
10.	Have you enclosed clause-by-clause compliance statement for the "List of requirements/ technical specifications "section? Compliance matrix indicating point wise compliance to all the points of tender document. Each point needs to be complied and single statement for all the points will not be agreed to.		
11.	Have you submitted copy of the last purchase order (s) and end user Certificate?		
12.	Is tender Submitted by an Indian Original Equipment Manufacturer (IOEM)?		
13.	Is tender Submitted by an Indian firm as integrator and Supplier of imported goods?		
14.	Whether Back-to-back support agreement with equipment manufacturer and software developer company attached?		
15.	Provided Permanent Account No. of bidding firm with proof.		
16.	Is sales & service tax number with registration certificate attached?		
17.	Given Name of the firm who quoted the price?		
18.	Given Name of tender currency?		
19.	Given Name of the supplier with complete address to whom supply order is to be Placed?		

20.	Un-priced bid similar to price bid with price hidden as per Chapter-5.		
21.	Signed integrity pact document as per enclosed format.		
22.	Proforma for performance Statement with documentary proof as per Annexure-VIII.		

(Name & Signature with date and firm/company seal)

TENDER TERMS & CONDITIONS ACCEPTANCE FORM

(For all the terms & conditions of tender document are acceptable to tenderer)

To
The Director General of
Meteorology,
India Meteorological
Department,
Lodi Road, New Delhi-110003

Ref: Tender Enquiry (TE) Document No. CPU/ --- dated ----

I/We, the undersigned have examined the above mentioned TE document, including amendment/corrigendum No. ,.....dated.....(if any), the receipt of which is hereby confirmed. We now offer to supply and deliver the goods and services in conformity with your above referred document.

If our tender is accepted, we undertake to supply the goods and perform the services (Installation & commissioning etc.) as mentioned in tender document with the delivery schedule specified in the "TENDER DOCUMENT- List of requirements/ technical specifications".

I/We further confirm that, if supply / purchase order is placed to firm, we shall provide performance security of required amount in an acceptable form for due performance of the contract within scheduled time.

I/ We agree to keep our tender valid for acceptance as required in tender document or for subsequently extended period, if any, agreed to by us. I/ We also accordingly confirm to abide by this tender up to the aforesaid period and this tender may be accepted any time before the expiry of the aforesaid period. I/We further confirm that, until a formal contract is executed, this tender read with your written acceptance thereof within the aforesaid period shall constitute a binding contract between us.

I/ We further understand that you are not bound to accept the lowest or any tender you may receive against your above-referred tender enquiry.

We confirm that we do not stand deregistered/banned/blacklisted by any Govt. Authorities.

I/ We confirm that we fully accept and agree to all the terms and conditions specified in above mentioned TE document, including amendment/ corrigendum etc. if any.

(Signature with date and seal of the company)

(Name and designation)

Duly authorised to sign tender for and on behalf of tenderer

Note*: 1. Firm/company shall use their own printed letter head for issuing this certificate.
2. Acceptance shall be unconditional.

MODEL BANK GUARANTEE FORMAT FOR FURNISHING EMD

(Format only)

Whereas
(hereinafter called the "tenderer")
has submitted their offer dated
for the supply of
(hereinafter called the "tender")
against the purchaser's tender enquiry No
KNOW ALL MEN by these presents that WE
of "having our registered office at
..... are bound into
(hereinafter called the "Purchaser")
in the sum of
for which payment will and truly to be made to the said Purchaser, the Bank binds itself, its
successors and assigns by these presents. Sealed with the Common Seal of the said Bank this
day 20 .

THE CONDITIONS OF THIS OBLIGATION ARE:

- (1) If the tenderer withdraws or amends, impairs or derogates from the tender in any respect within the period of validity of this tender.
- (2) If the tenderer having been notified of the acceptance of his tender by the Purchaser during the period of its validity:-
 - If the tenderer fails to furnish the Performance Security for the due performance of the contract.
 - Fails or refuses to accept/execute the contract.

WE undertake to pay the "Director General of Meteorology, India Meteorological Department", up to above amount upon receipt of its first written demand, without the Purchaser having to substantiate demand, provided that in its demand the Purchaser will note that the amount claimed by it is due to owing to the occurrence of one or both the two conditions, specifying the occurred condition / conditions.

This guarantee will remain in force up to and including 180 days or after the finalisation of tender any demand in respect thereof should reach the Bank not later than the above date.

Bank Guarantee issued with the tender enquiry reference No. CPU/..... Dated

(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

BANK GUARANTEE MODEL FORMAT FOR PERFORMANCE SECURITY

To

The President of India

Through :- Director General of Meteorology,

India Meteorological Department,

Lodi Road, New Delhi-110003

WHEREAS _____ (Name and address of the supplier) (Hereinafter called “the supplier”) has undertaken, in pursuance of contract no _____ dated _____ to supply (description of goods and services) (herein after called “the contract”).

AND WHEREAS it has been stipulated by you in the said contract that the supplier shall furnish you with a bank guarantee by a scheduled commercial bank recognized by you for the sum specified therein as security for compliance with its obligations in accordance with the contract;

AND WHEREAS we have agreed to give the supplier such a bank guarantee;

NOW THEREFORE we hereby affirm that we are guarantors and responsible to you, on behalf of the supplier, up to a total of. _____ (Amount of the guarantee in words and figures), and we undertake to pay you, upon your first written demand declaring the supplier to be in default under the contract and without cavil or argument, any sum or sums within the limits of (amount of guarantee) as aforesaid, without your needing to prove or to show grounds or reasons for your demand or the sum specified therein. We hereby waive the necessity of your demanding the said debt from the supplier before presenting us with the demand. We further agree that no change or addition to or other modification of the terms of the contract to be performed there under or of any of the contract documents which may be made between you and the supplier shall in any way release us from any liability under this guarantee and we hereby waive notice of any such change, addition or modification. This guarantee shall be valid up to and including the _____ day of _____, 20____

(Signature with date of the authorized officer of the Bank)

Name and designation of the officer

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

CERTIFICATE OF JOINT RECEIPT INSPECTION

For procurement of [11 numbers C- band Dual Polarised Doppler Weather Radars]

In reference to the supply order number CPU/ / / dated entered into between INDIA METEOROLOGICAL DEPARTMENT, MoES and [BIDDER NAME], the undersigned representatives hereby certify that joint inspection of the below mentioned consignment has been carried out in accordance with the requirement set forth in said order.

Site of Inspection:

Packing List Reference:

Date consignment Delivered:

Dates of Joint Inspection:

All stores/ equipment/ material have been received correctly except the following:-

Items Not Received

Part No	Packing Ref	Item	Quantity Deficient
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Items found damaged

Part No	Packing Ref	Item	Damage Description
---------	-------------	------	--------------------

Any Other Remarks/ Comments:

Signed on Behalf of IMD

Signed on behalf of {bidder Firm}

This Certificate is hereby countersigned by the undersigned representatives of [First Party Name] and [Second Party Name] certifying that Joint Inspection described above has been successfully performed.

Signed on Behalf of IMD

Signed on behalf of {bidder Firm}

Terms & Conditions of Comprehensive Annual Maintenance Contract (CAMC) 11 numbers of C-Band Dual Polarimetric Doppler Weather Radars

1. The CAMC includes Control Center and Radar Site Material & Services inclusive of all Computer peripherals, Printers, Radar modules, spares, components, cables, connectors etc and radar related materials like UPS, DG, Radome, Tower, etc. and the removed/replaced defective material becomes the property of "The Contractor".
2. The CAMC clause will be applicable for control center and individual radar sites separately.
3. The CAMC will commence immediately after the expiry of the warranty period. The comprehensive service includes preventive and corrective maintenance and free replacement of all the defective parts/devices. The company should submit a detailed CAMC plan including preventive maintenance schedule.
4. The "Contractor" shall supply the details of its call center meant for booking the complaints along with the contact numbers like mobile nos., phone nos., mail address and names etc of its service engineers.
5. The radar shall be decommissioned for a period of two weeks for annual preventive maintenance and upkeep in a cyclic mode.
6. The "Contractor's" engineers attending to the system are required to make all entries of their work done and corrective measures taken by them with their signatures in the log book kept with the Radar.
7. Overall uptime of the system shall be at least 95%. If there is a failure of the system for more than the criteria stipulated then the CAMC amount of 0.5% per day, for days it is down will be deducted, subjective to an upper ceiling of 10% of CAMC charges for that quarter. If the failure duration extends beyond one month then the contract may be terminated and cost of its repair from alternate source will be recovered from the "Contractor" and performance security may be forfeited. Maximum two weeks shutdown for annual maintenance shall not come under the clause. Radar down time due to external factors and severe natural calamity beyond human control shall exempt the criteria.
8. Supplier shall ensure 95% uptime by supportive manpower if found necessary.
9. Date of commencement of Annual Maintenance Period of the individual radars shall be fixed by IMD.
10. The mode of payment will be quarterly and it will be made after end of each quarter on the basis of satisfactory performance certificate from user.
11. "The Contractor" will assist IMD for regular backups of all the software. The "Contractor" is also required to restore the existing Software from the Backups whenever required.
12. "The Contractor" will also be responsible for configuring the networking components.

13. CAMC contract will be signed for seven years. If required, contract may be extended by IMD. However, IMD reserves the right to terminate the contract at any time by giving three months' notice, if the performance of the system or the services rendered by the supplier is not found satisfactory.
14. The "Contractor" has to submit an undertaking that it will not use IMD data for any commercial purpose.
15. This contract shall be governed in all respects by Indian Laws.

FORMAT FOR DELIVERABLES FOR SUPPLY OF 07 Nos. KLYSTRON BASED C-BAND DUAL POL. DOPPLER WEATHER RADARS

S.No	Items	Qty.	Make, model & country of origin	Cost Per Unit	Applicable taxes	Total cost
	C-band dual polarized Doppler weather radar system including all units/sub units and accessories :	7 Sets				
1	<i>Transmitter</i>	7				
2	<i>Receiver</i>	7				
3	<i>Antenna control unit and Radar control unit</i>	7				
4	<i>Radar signal processor</i>	7				
5	<i>Radome, Antenna & Antenna Pedestal</i>	7				
6	<i>Peripherals as per detail at 2.39, Page No.28</i>	7				
7	<i>Radar Application and Operating Software</i>	7				
8	<i>Peripherals as per detail at 2.39, Page No.28 along with one central server and one WEBGIS server to be installed at Delhi.</i>	1				
9	<i>Built in Test equipment (BITE)</i>	7				
10.	<i>Acceptance testing (Factory)</i>	7				
11.	<i>Acceptance testing (Site)</i>	7				
12	<i>Installation</i>	7				
13	<i>Services</i>	7				
14	<i>Products (Software)</i>	7				
15	<i>Any other unit/subunits/item not listed above but required for functioning of DWR shall also be included</i>	7				
16	<i>Installation material</i>	7				
17	<i>Documentation both hard copy and soft copy (2 Sets per Site and 2 sets at Delhi)</i>	16				
18	<i>Communication hardware/software for data transfer to central location.</i>	7				
19	<i>Training to IMD personnel at each site after completion of installation / commissioning for five working days. Note: Expenses for trainees such as airfare , lodging and per diem to be borne by IMD</i>	7				
20	<i>Training to IMD personnel at factory for three weeks. Note: Expenses for trainees such as airfare , lodging and per diem to be borne by IMD</i>	1				

21	<i>7 years (Year-wise) comprehensive Annual Maintenance Contract (CAMC) (for all 7 radar sites and central servers) after the expiry of 3 years warranty period</i>					
	1 st Year CAMC					
	2 nd Year CAMC					
	3 rd Year CAMC					
	4 th Year CAMC					
	5 th Year CAMC					
	6 th Year CAMC					
	7 th Year CAMC					
22	<i>Towers for installation inclusive of all civil works</i>	7				
23	<i>Two UPS each of 15 KVA capacity</i>	14				
24	<i>Enclosure with appropriate cooling (Pt. 2.43, Page No. 29)</i>	7				
25	<i>20 KVA Diesel Generator</i>	7				

Note:

- **No extra cost will be paid for initial three years warranty.**
- All the above items are to be supplied in quantities shown above. However, if a particular item is combined with another item the fact may be so stated against that item without dropping it.
- If a particular item is not used in the radar system it may be so stated against that item.
- If an item equivalent to the listed items is used in the radar details of same may be stated against that item.
- Manufacturer shall also include any other recommended spares (one each) specific to their radar system and identified as critical item.

**FORMAT FOR DELIVERABLES FOR SUPPLY OF 04 Nos. SOLID STATE POWER
AMPLIFIER BASED C-BAND DUAL POL. DOPPLER WEATHER RADARS**

S.No	Items	Qty.	Make, model & countr y of origin	Cost Per Unit	Applica ble taxes	Tota l cost
	C-band dual polarized Doppler weather radar system including all units/sub units and accessories as follows:	4 Sets				
1	<i>Transmitter</i>	4				
2	<i>Receiver</i>	4				
3	<i>Antenna control unit and Radar control unit</i>	4				
4	<i>Radar signal processor</i>	4				
5	<i>Radome, Antenna & Antenna Pedestal</i>	4				
6	<i>Peripherals as per detail at 2.39, Page No.32</i>	4				
7	<i>Radar Application and Operating Software</i>	4				
8	<i>Peripherals as per detail at 2.39, Page No.32 along with one central server and one WEBGIS server to be installed at Delhi.</i>	1				
9	<i>Built in Test equipment (BITE)</i>	4				
10.	<i>Acceptance testing (Factory)</i>	4				
11.	<i>Acceptance testing (Site)</i>	4				
12.	<i>Installation</i>	4				
13.	<i>Services</i>	4				
14.	<i>Products(Software)</i>	4				
15.	<i>Any other unit/subunits/item not listed above but required for functioning of DWR shall also be included</i>	4				

16.	<i>Installation material</i>	4				
17.	<i>Documentation both hard copy and soft copy (2 Sets per Site and 2 sets at Delhi)</i>	10				
18.	<i>Communication hardware/software for data transfer to central location.</i>	4				
19.	<i>Training to IMD personnel at each site after completion of installation / commissioning for five working days.</i> <i>Note: Expenses for trainees such as airfare , lodging and per diem to be borne by IMD</i>	4				
20.	<i>Training to IMD personnel at factory for three weeks.</i> <i>Note: Expenses for trainees such as airfare , lodging and per diem to be borne by IMD</i>	1				
21.	<i>7 years (Year-wise) comprehensive Annual Maintenance Contract (CAMC) (for all 4 radar sites and central servers) after the expiry of 3 years warranty period</i>					
	<i>1st Year CAMC</i>					
	<i>2nd Year CAMC</i>					
	<i>3rd Year CAMC</i>					
	<i>4th Year CAMC</i>					
	<i>5th Year CAMC</i>					
	<i>6th Year CAMC</i>					
22.	<i>Towers for installation inclusive of all civil works</i>	4				
23.	<i>Two UPSs each of 15 KVA capacity</i>	8				
24.	<i>Enclosure with appropriate cooling (Pt. 2.43, Page No. 33)</i>	4				
25.	<i>20 KVA Diesel Generator</i>	4				

***Note:**

- **No extra cost will be paid for initial three years warranty.**
- All the above items are to be supplied in quantities shown above. However, if a particular item is combined with another item the fact may be so stated against that item without dropping it.
- If a particular item is not used in the radar system it may be so stated against that item.
- If an item equivalent to the listed items is used in the radar details of same may be stated against that item.
- Manufacturer shall also include any other recommended spares (one each) specific to their radar system and identified as critical item.

PROFORMA FOR PERFORMANCE STATEMENT

**Bid No. Date of
Opening.....Time.....Hours.....**

Name of the firm

Order placed by (Full address of the purchaser)	Order No. And date	Description and quantity of ordered equipment	Value of order	Date of completion of delivery as per contract actual	Remarks including reason for late delivery, if any	Has the equipment been satisfactorily functioning?

Signature and seal of the bidder.....

List of tentative locations for installation of 11 nos. C-Band Dual Polarised Doppler Weather Radar.

List-1: For 07 nos. Klystron based C-Band Dual Polarised Doppler Weather Radar.

S.No	Name of the stations
1	Mumbai, Maharashtra
2	Port Blair, Andaman & Nicobar Islands
3	Ranchi, Jharkhand
4	Lakshadweep, Island
5	Raipur, Chhattisgarh.
6	Ratnagiri, Maharashtra
7	Mangalore, Karnataka

List-2: For 04 nos. SSPA based C-Band Dual Polarised Doppler Weather Radar.

S.No	Name of the stations
1	Bengaluru, Karnataka
2	Anantapur, Andhra Pradesh
3	Sambhalpur, Odisha
4	Ahmedabad, Gujarat

PRE CONTRACT INTEGRITY PACT

General

This pre-bid pre-contract Agreement (hereinafter called the Integrity Pact) is made on _____ day of the month of _____, 2018, between, on one hand, the President of India acting through Dr. K. J. Ramesh. DGM, IMD, MoES, Government of India (hereinafter called the "BUYER", which expression shall mean and include, unless the context otherwise requires, his Successors in office and assigns) of the First Part and M/s _____ represented by Shri _____, Chief Executive Officer (hereinafter called the "BIDDER/Seller" which expression shall mean and include, unless the context otherwise requires, his successors and permitted assigns) of the Second Part.

WHEREAS the BUYER proposes to procure _____ (Name of the Stores/Equipment/Item) and the BIDDER/Seller is willing to offer/has offered the stores and
WHEREAS the BIDDER is a private company/public company/Government undertaking/partnership/registered export agency, constituted in accordance with the relevant law in the matter and the BUYER is a Ministry/Department of the Government of India/PSU performing its functions on behalf of the President of India.

NOW, THEREFORE,

To avoid all forms of corruption by following a system that is fair, transparent and free from any influence/prejudiced dealings prior to, during and subsequent to the currency of the contract to be entered into with a view to :-

Enabling the BUYER to obtain the desired said stores/equipment at a competitive price in conformity with the defined specifications by avoiding the high cost and the distortionary impact of corruption on public procurement, and Enabling BIDDERS to abstain from bribing or indulging in any corrupt practice in order to secure the contract by providing assurance to them that their competitors will also abstain from bribing and other corrupt practices and the BUYER will commit to prevent corruption, in any form, by its officials by following transparent procedures.

The parties hereto hereby agree to enter into this Integrity Pact and agree as follows:

Commitments of the BUYER

- 1.1 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.
- 1.2 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.

- 1.3 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.
2. In case 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

3. The BIDDER commits itself to take all measures necessary to prevent corrupt practices, unfair means and illegal activities during any stage of its 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 commit itself to the following:-
 - 3.1 The BIDDER will not 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.
 - 3.2 The BIDDER further undertakes that it 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.
 - 3.3 BIDDERS shall disclose the name and address of agents and representatives and Indian BIDDERS shall disclose their foreign principals or associates.
 - 3.4 BIDDERS shall disclose the payments to be made by them to agents/brokers or any other intermediary, in connection with this bid/contract.
 - 3.5 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 in respect of any such intercession, facilitation or recommendation.

- 3.6 The BIDDER, either while presenting the bid or during pre-contract negotiations or before signing the contract, shall disclose any payments he has made, 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 services agreed upon for such payments.
- 3.7 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.
- 3.8 The BIDDER will not accept any advantage in exchange for any corrupt practice, unfair means and illegal activities.
- 3.9 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.
- 3.10 The BIDDER commits to refrain from giving any complaint directly or through any other manner without supporting it with full and verifiable facts.
- 3.11 The BIDDER shall not instigate or cause to instigate any third person to commit any of the actions mentioned above.
- 3.12 If the BIDDER or any employee of the BIDDER or any person acting on behalf of the BIDDER, either directly or indirectly, is a relative of any of the officers of the BUYER, or alternatively, if any 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. The term "relative" for this purpose would be as defined in Section 6 of the Companies Act 1956.
- 3.13 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.

4. Previous Transgression

- 4.1 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 that could justify BIDDER's exclusion from the tender process.
- 4.2 The BIDDER agrees that if it makes incorrect statement on this subject, BIDDER can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason.

5. Earnest Money (Security Deposit)

- 5.1 While submitting commercial bid, the BIDDER shall deposit an amount (to be specified in TENDER DOCUMENT) as Earnest Money/Security Deposit, with the BUYER through any of the following instruments:
- (i) Bank Draft or a Pay Order in favour of _____
 - (ii) A confirmed guarantee by an Indian Nationalised Bank, promising payment of the guaranteed sum to the BUYER on demand within three working days without any demur whatsoever and without seeking any reasons whatsoever. The demand for payment by the BUYER shall be treated as conclusive proof of payment.
 - (iii) Any other mode or through any other instrument (to be specified in the TENDER DOCUMENT).
- 5.2 The Earnest Money/Security Deposit shall be valid upto a period of five years or the complete conclusion of the contractual obligations to the complete satisfaction of both the BIDDER and the BUYER, including warranty period, whichever is later.
- 5.3 In case of the successful BIDDER a clause would also be incorporated in the Article pertaining to Performance 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.
- 5.4 No interest shall be payable by the BUYER to the BIDDER on Earnest Money/Security Deposit for the period of its currency.

6. Sanctions for Violations

- 6.1. Any breach of the aforesaid provisions by the BIDDER or any one employed by it or acting on its behalf (whether with or without the knowledge of the BIDDER) 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) The Earnest Money Deposit (in pre-contract stage) and/or Security Deposit/Performance Bond (after the contract is signed) 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 giving any compensation to the BIDDER.
 - (iv) To recover all sums already paid by the BUYER, and in case of an Indian BIDDER with interest thereon at 2% higher than the prevailing Prime Lending Rate of State Bank of India, while 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 stores, such outstanding payment could also be utilised to recover the aforesaid sum and interest.
 - (v) To encash the advance bank guarantee and performance bond/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. The BIDDER shall be liable to pay compensation for any loss or damage to the BUYER resulting from such cancellation/rescission and the BUYER shall be entitled to deduct the amount so payable from the money(s) due to the BIDDER.
- (vii) To debar the BIDDER from participating in future bidding processes of the Government of India for a minimum period of five years, which may be further extended at the discretion of the BUYER.
- (viii) To recover all sums paid in violation of this Pact by BIDDER(s) to any middleman or agent or broker with a view to securing the contract.
- (ix) 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.
- (x) 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.

6.2 The BUYER will be entitled to take all or any of the actions mentioned at para 6.1 (i) to (x) of this Pact also on the Commission by the BIDDER or any one employed by it or acting on its behalf (whether with or without the knowledge of the BIDDER), of an offence as defined in Chapter IX of the Indian Penal code, 1860 or Prevention of Corruption Act, 1988 or any other statute enacted for prevention of Corruption.

6.3 The decision of the BUYER to the effect that a breach of the provisions of this Pact has been committed by the BIDDER shall be final and conclusive on the BIDDER. However, the BIDDER can approach the Independent Monitor(s) appointed for the purposes of this Pact.

7. Fall Clause

The BIDDER undertakes that it has not supplied/is not supplying similar product/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 or PSU and if it is found at any stage that similar product/systems or sub systems was supplied by the BIDDER to any other Ministry/Department of the Government of India or a PSU 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, if the contract has already been concluded.

8. Independent Monitors

8.1 The BUYER has appointed following Independent Monitors (hereinafter referred to as Monitors) for this Pact in consultation with the Central Vigilance Commission.

1. Shri Arun Kumar, Ex. Secretary, Oil Industry Development Board (OIDB), (E Mail: kumararun_53@rediffmail.com, Mobile No. 9810621113)
2. Shri Sushil Gupta, Ex. Chairman, Central Ground Water Board (CGWB) & Central Ground Water Authority (CGWA), (E Mail: sushilanitagupta@yahoo.com. Mobile No. 9999744061)

- 8.2 The task of the Monitors shall be to review independently and objectively, whether and to what extent the parties comply with the obligations under this Pact.
- 8.3 The Monitors shall not be subject to instructions by the representatives of the parties and perform their functions neutrally and independently.
- 8.4 Both the parties accept that the Monitors have the right to access all the documents relating to the project/procurement, including minutes of meetings.
- 8.5 As soon as the Monitor notices, or has reason to believe, a violation of this Pact, he will so inform the Authority designated by the BUYER.
- 8.6** The BIDDER(s) accepts that the Monitor has the right to access without restriction to all Project documentation of the BUYER including that provided by the BIDDER. The BIDDER will also grant the Monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his project documentation. The same is applicable to Subcontractors. The Monitor shall be under contractual obligation to treat the information and documents of the BIDDER/Subcontractor(s) with confidentiality.
- 8.7 The BUYER will provide to the Monitor sufficient information about all meetings among the parties related to the Project provided such meetings could have an impact on the contractual relations between the parties. The parties will offer to the Monitor the option to participate in such meetings.
- 8.8 The Monitor will submit a written report to the designated Authority of BUYER/Secretary in the Departments within 8 to 10 weeks from the date of reference or intimation to him by the BUYER / BIDDER and, should the occasion arise, submit proposals for correcting problematic situations.

9. Facilitation of investigation

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

10. Law and Place of Jurisdiction

This Pact is subject to Indian Law. The place of performance and jurisdiction is the Seat Of the BUYER.

11. 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.

12. Validity

12.1 The validity of this Integrity Pact shall be from date of its signing and extend upto 5 years or the complete execution of the contract to the satisfaction of both the BUYER and the BIDDER/Seller, including warranty period, whichever is later. In case BIDDER is unsuccessful, this integrity Pact shall expire after six months from the date of the signing of the contract.

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

13. The parties hereby sign this integrity Pact at _____ On _____

BUYER
Name of the Officer.
Designation
Dept./MINISTRY/PSU

BIDDER
CHIEF EXECUTVE OFFICER

Witness

- 1.
- 2.

Witness

- 1.
- 2.

* Provisions of these clauses would need to be amended/ deleted in line with the policy of the BUYER in regard to involvement of Indian agents of foreign Suppliers.

**PROFORMA FOR CERTIFICATE FROM THE USER INDICATING SUCCESSFUL
OPERATION OF RADAR**

TO WHOMSOEVER IT MAY CONCERN

This is to certify that the Doppler radar with associated subsystems and peripherals supplied by M/s _____ to _____ on date _____ Vide M/s _____ Supply order no. _____ dated _____ (copy enclosed) installed and commissioned on _____. The Doppler radar system is working satisfactorily for _____ months/ years. The said radar is under continuous operation since _____ and are providing satisfactory results.

Signature of authorized signatory

Name of authorized signatory

Complete office address

With office seal and date