



**India Meteorological Department
Mausam Bhawan, Lodi Road
New Delhi-110003**

TENDER DOCUMENT

For procurement of “CMS AND GIS BASED CENTRAL IMD WEBSITE”

Section-I
Notice Inviting Tender (NIT)

Tender Enquiry No. CPU/52/0414/9679 Dated: 28.05.2014

1. Director General of Meteorology (DGM), India Meteorological Department (IMD), Ministry of Earth Sciences (MoES), Government of India, on behalf of president of India invites sealed tenders in two bid systems i.e. (i) Technical bid & (ii) Price bid from eligible and qualified firms for supply, installation & commissioning of following Goods/Articles/Services.

2. Name of Goods/Article/Services: **CMS AND GIS BASED CENTRAL IMD WEBSITE**

3. **Specification and quantity:**

As per section under "List of Requirements and technical specifications".

4. **Tender schedule is as follows:**

1.	Cost of Tender Document (Non-Refundable) in the form of demand draft	Rs.1000.00
2.	PRE BID Conference (A) Date & Time (B) Venue	19.06.2014 /1100Hrs DDGM (ISSD) Office IMD, Lodi Road, New Delhi-110003
3.	Closing date and time for submission of tender	18.07.2014 / 1500 Hrs
4.	Tender Opening date & time (Technical Bid)	18.07.2014 /1530 Hrs
5.	Place of Tender opening	Central Purchase Unit O/0 DGM, IMD Lodi Road ,New Delhi-110003

5. Earnest Money Deposit (EMD): Rs. 13.20 Lakh (Rupees Thirteen Lakh Twenty Thousand only) /USD 22000.00 . EMD shall be accepted from the participating firm only in the form of Bank Guarantee (BG)/Fixed Deposit Receipt (FDR). Bank Guarantee issued from foreign banks must be authenticated by State Bank of India or any nationalized bank of India.

6. SSI, Micro and small Enterprises if registered with any government bodies specified by Ministry of Micro, Small & Medium Enterprises (MoMSME) are exempted for submitting the **tender fee and earnest money deposit (EMD)**. Other Firms, registered with DGS&D / NSIC, are also exempted for submitting EMD. The exemption and relaxation in tender fee and EMD are subject to validity of their registration on the date of opening of tender.

7. All prospective tenderers are requested to attend the Pre Bid meeting if mentioned above. The venue, date and time are indicated in the Para 4 above.
8. Tenderer may download the **Tender Enquiry Document** from the web site www.imd.gov.in & eprocure.gov.in and submit its tender by utilizing the downloaded document, along with the required non-refundable tender document cost as mentioned in Para 4 above in the form of Demand Draft drawn on a commercial bank in India.
9. Demand Draft for tender document cost may be issued in the favour of “DDO, O/O Director General of Meteorology, IMD, New Delhi” and payable at New Delhi.
10. Tenderers shall ensure that their tenders complete in all respects, are dropped in the Tender Box located at Reception (Main gate) Mausam Bhawan, IMD, and Lodi Road, New Delhi-110003. Tender may be submitted by hand in case of bulky documentation. Tenders may be sent by post also however purchasing organization is not responsible for any delay and loss whatsoever postal or otherwise.
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 remaining the same.
12. The Tender Enquiry Documents are not transferable.
13. Purchaser: The President of India
Through Director General of Meteorology
India Meteorological Department
Lodi Road, New Delhi-110003
14. Consignee: Dy. Director General of Meteorology(ISSD)

India Meteorological Department

Lodi Road, New Delhi-110003
15. Testing & Acceptance Authority : Dy. Director General of Meteorology(ISSD)

India Meteorological Department

Lodi Road, New Delhi-110003

Dy. Director General of Meteorology (Central Purchase Unit)
O/o Director General of Meteorology,
India Meteorological Department,
Lodi Road, New Delhi-110003
Telefax No: 011-24698148

निविदा आमंत्रित करने की सूचना (एन आई टी)

निविदा जाँच सं. CPU/52/0414/9679 Dated: 28.05.2014

1. मौसम विज्ञान के महानिदेशक (मौविमनि) भारत मौसम विज्ञान विभाग (भा.मौ.वि.वि.) पृथ्वी विज्ञान मंत्रालय, भारत सरकार, भारत के राष्ट्रपति की ओर से नीचे लिखे सामान / वस्तुएँ / सेवाओं की आपूर्ति, संस्थापन और आरंभ के लिए पात्र और अर्हक निविदाकारों से दो बिड प्रणाली अर्थात (एक) तकनीकी बिड और (दो) दर बिड में मोहरबंद टेंडर आमंत्रित करते हैं –
2. सामान/ वस्तुएँ/ सेवाओं का नाम: **CMS AND GIS BASED CENTRAL IMD WEBSITE**
3. विनिर्देशन और मात्रा: विनिर्देशन आर एफ पी के अनुसार, मात्रा-
4. निविदा अनुसूची इस प्रकार है:

1.	निविदा कागजात की लागत (अप्रतिदेय) डिमांड ड्राफ्ट/ पे आर्डर के रूप में	Rs.1000.00
2.	प्री बिड कांफ्रेंस (क) दिनांक व समय (ख) स्थान	19.06.2014 /1100Hrs उप महनिदेशक (सूचना प्रणाली एवम सेवा प्रभाग) का कार्यालय भारत मौसम विभाग, मौसम भवन लोदी रोड, नई दिल्ली -110003
3.	निविदा जमा करने की अंतिम तिथि व समय	18.07.2014 / 1500 Hrs
4.	निविदा खोलने की तिथि व समय (तकनीकी बिड)	18.07 .2014 /1530 Hrs
5.	निविदा खोलने का स्थान	केंद्रीय क्रय एकक, कार्यालय महानिदेशक, भारत मौसम विज्ञान विभाग लोदी रोड, नई दिल्ली-110003

5. धरोहर राशि (ई एम डी): रु.13.20 लाख (रुपये तेरह लाख बीस हजार केवल) बोली लगाने वाले द्वारा । विदेशी बैंक द्वारा दी गई बैंक गारंटी भारतीय बैंक से भी प्रमाणित होनी चाहिए । ईएमडी केवल बैंक गारंटी (बीजी) / सावधि जमा रसीद (एफडीआर) के रूप में भाग लेने फर्म से स्वीकार किए जाएंगे.
6. (क) लघु उद्योग, कुटीर और छोटे पैमाने पर उद्यम जो किसी भी सरकारी निकायों के साथ पंजीकृत है, उनको निविदा शुल्क और धरोहर राशि (EMD) प्रस्तुत करने के लिए छूट दी गई है।
(ख) डीजीएस एंड डी / एनएसआईसी के साथ पंजीकृत अन्य कंपनियों को भी ईएमडी जमा करने के लिए छूट दी गई है।
(ग) निविदा शुल्क और ईएमडी में छूट और छूट निविदा खोलने की तारीख पर उनके पंजीकरण की वैधता के अधीन हैं.
7. ऐसे निविदाकार जो रुचि रखते हों इस आवश्यकता के बारे में और जानकारी परेषिति से ले सकते हैं । सभी भावी निविदाकर्ता प्री बिड बैठक (समारोह स्थल, तारीख और समय) में भाग ले सकते हैं यदि ऊपर पैरा 4 मे

अनुरोध किया गया हैं। ऐसे निविदाकार जो रुचि रखते हों इस आवश्यकता के बारे में और जानकारी परेषिति से ले सकते हैं ।

8. निविदाकर्ता www.imd.gov.in और eprocare.gov.in वेबसाइट से निविदा जांच कागजात डाउनलोड कर सकते हैं और डाउनलोड किए गए कागजात का उपयोग करके "सहायक मौसम विज्ञानी(डी.डी.ओ.) मौसमविज्ञान का कार्यालय, भा.मौ.वि.वि., नई दिल्ली" के नाम से भारत के किसी कमर्शियल बैंक के डिमांड ड्राफ्ट/ पे आर्डर के रूप में उक्त पैरा 4 में बताए गए अनुसार निविदा की लागत के लिए अपेक्षित अप्रतिदेय शुल्क के साथ निविदा जमा कर सकते हैं।
9. निविदा दस्तावेज लागत के लिए डिमांड ड्राफ्ट, "मौसम विज्ञान के डीडीओ, कार्यालय महानिदेशक, भारतीय मौसम विभाग, नई दिल्ली" के पक्ष और नई दिल्ली में देय, जारी किया जा सकता है।
10. निविदाकर्ताओं को यह सुनिश्चित करना होगा कि उनकी सभी तरह से पूर्ण निविदाएँ स्वागत कक्ष (मुख्य द्वार) मौसम भवन, भा.मौ.वि.वि., लोदी रोड, नई दिल्ली-110003 में रखी गई निविदा पेटी में डाल दी जाएँ । यदि कागजात ज्यादा भारी हैं तो निविदा हाथों हाथ भी जमा कराई जा सकती हैं । निविदाएँ डाक द्वारा भी भेजी जा सकती हैं परंतु चाहे वह डाक से संबंधित हो अथवा अन्यथा किसी भी प्रकार के विलम्ब अथवा नुकसान के लिए क्रय संगठन जिम्मेवार नहीं होगा ।
11. यदि निविदा खोलने की तारीख के दिन क्रय संगठन का अवकाश घोषित होता है तो निविदा अगले कार्य दिवस को खोली जाएगी , निविदा खोलने का स्थान और तारीख वही रहेंगे ।
12. निविदा जाँच कागजात अहस्तांतरणीय हैं ।
13. क्रयकर्ता: भारत के महामहिम राष्ट्रपति
भा.मौ.वि.वि.के माध्यम से
भारत मौसम विज्ञान विभाग,
लोदी रोड, नई दिल्ली-110003
14. परेषिति: मौसम विज्ञान के उपमहानिदेशक
(सूचना प्रणाली एवम सेवा प्रभाग))
भारत मौसम विज्ञान विभाग
लोदी रोड, नई दिल्ली-110003
15. जाँच प्राधिकारी: मौसम विज्ञान के उपमहानिदेशक
(सूचना प्रणाली एवम सेवा प्रभाग))
भारत मौसम विज्ञान विभाग
लोदी रोड, नई दिल्ली-110003

उपमहानिदेशक केंद्रीय क्रय एकक (कें.क्र.ए) ,
मौसम विज्ञान के महानिदेशक का कार्यालय,
लोदी रोड, नई दिल्ली- 110003
टेलीफैक्स सं. : 011-24698148

SECTION – II

GENERAL INSTRUCTIONS TO TENDERERS (GIT)

1. Introduction

The Purchaser has issued this TE documents for purchase of goods/stores/articles and related services as mentioned in Section “**List of requirements / Technical specifications**” ,which also indicates, *inter alia*, the required stores, delivery schedule, terms and place of delivery etc. This section (“General Instructions to Tenderers”) provides the relevant information as well as instructions to assist the prospective tenderers in preparation and submission of tenders.

2. Language of Tender

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

3. Eligible Goods and Services

All goods and related services to be supplied under the contract shall have their origin in India or any other country with which India has not banned trade relations. The term “origin” used in this clause means the place where the goods are mined, grown, produced, or manufactured or from where the related services are arranged and supplied.

4. Tendering Expense

The tenderer shall bear all the costs and expenditure incurred and/or to be incurred by it in preparation, mailing and submission of its 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.

5. PRE-BID CONFERENCE:

Pre-bid conference shall be held as per NIT schedule so as to provide an opportunity to the participating bidders to interact with IMD with regard to various tender provisions/clauses, before the bids are submitted. In case, due to the points/doubts raised by the prospective bidders, needs to be modified, and then the same will be considered for modification. After pre-bid conference, tender conditions will be frozen. No change will be permissible after bid opening. Clarification needed if any may be sent before commencement of pre-bid meeting. No reply in this regard shall be sent to individual bidders. Bidders are advised to visit IMD Website to get the final view and clarification of IMD. Bidders should depute their authorised representative for pre-bid meeting.

6. Amendments to TE documents:

At any time prior to the deadline for submission of tenders, the purchaser may, for any reason deemed fit by it, modify the TE documents by issuing suitable amendment(s) to it. The amendment will be notified in news paper, IMD web site and CPP portal. In order to provide reasonable time to the prospective tenderers 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.

7. Documents Comprising the Tender:

The **Two Bid System**, i.e. “Techno – Commercial Bid” and “Price Bid” prepared by the tenderer shall comprise the followings:

(1).Techno – Commercial Tender (Un priced Tender)

- (i) Original forwarding letter from the bidder. Scanned letter shall not be accepted.
- (ii) Checklist section (Annexure-I) properly filled and signed.
- (iii) Demand Draft (DD) for tender document cost.
- (iv) Earnest Money Deposit (**EMD**) **in the form of FDR/BG. EMD shall be submitted by the bidder only.**
- (v) Technical proposal.
- (vi) Compliance statement/table.
- (vii) List of deliverables (unpriced/without price) with make & model etc. **This should be exactly same as attached in price bid.**
- (viii) Documentary evidence for eligibility.
- (ix) Tender Form (Annexure-II) duly signed. (i:e tenderer has agreed to all the terms & condition of tender enquiry document). **Original documents (original signature with date and office/company seal) should be attached with original set of tender.**
- (x) Tenderer who quotes for goods manufactured by some other manufacturer shall furnish Manufacturer’s Authorisation Form. (annexure-III)
- (xi) It is compulsory for all Indian firms (agent/ authorised supplier/ dealer/ subsidiary/ integrators/ Distributors/ Stockist etc of their foreign principals) desirous to quote in foreign currency directly on behalf of their foreign principal (if payment has to be made to their foreign principal), to get themselves enlisted with DGS&D as per directive of Department of Expenditure, Ministry of Finance. **Proof of enlistment with Department of Expenditure, Ministry of Finance through DGS&D for Indian agents who desires to quote directly on behalf of their foreign principal** and copy agreement between Indian agent and foreign principal and precise relationship between them and their mutual interest in this tender, must be furnished along with their technical bid.

The enlistment is not equivalent to the Registration with DGS&D. Registration with the DGS&D shall not be treated as Enlistment if Indian firm quoting on behalf their foreign principal.

DGS&D registered Indian firm (Supplier /Integrator /Distributors/ Distributors /Stockist etc) for imported stores shall quote in INR only. No foreign exchange shall be released by IMD and also no payment shall be made to their foreign principal. **Bids on High Sea Sale based are not permitted/ not allowed. Such financial bid shall be straightway declared unresponsive and not be considered for financial evaluation.**

- (xii) Authorization letter from principal authorizing Indian representative **to only submit the tender document** on behalf of foreign principal. Above documents must be enclosed with technical bids otherwise bids may be ignored and not to considered for technical evaluation.
- (xiii) Each page of proposal submitted by the tenderer shall have firm/company seal and original signature of authorised person of firm. Unsigned tender shall be ignored.

(2) Price Bid:

- (i) All pages of the price bid should be page numbered, indexed and signed with company/firm seal by authorized signatory.
- (ii) Price Bid shall be preferred as per price schedule format (Annexure-VI).
- (iii) Costing, of each and every item, sub items offered in bidder's technical bid, shall be done with all breakup prices.
- (iv) The Tenderer 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 (H/w & S/w) , services, packing, inland transportation/freight/insurance to the sites, VAT , service tax etc** against the requirement.
- (v) Wherever, the Purchaser's invitation to tender calls for installation and commissioning or supervision of installation and commissioning of the instrument/equipment by the tenderer, the tenderer must clearly and separately quote the prices for the supply of the stores and the charges and the terms for installation and commissioning or supervision of installation and commissioning as the case may be. The charges towards installation and commissioning should not be included in the price of the stores.
- (vi) In respect of contracts involving installation and commissioning **by the overseas supplier** where charges for the same has been quoted by the tenderer, **firm shall bear the Income-tax liability as per rates prevailing** at the time of undertaking the job in accordance with the Income-tax Act in force in India on the installation and commissioning charges.
- (vii) 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.
- (viii) Indian vendor shall quote prices on F.O.R destination (sites of consignee) basis and Payment to Indian supplier shall be paid into Indian rupees only.
- (ix) The Indian bidder supplying imported goods shall quote only in Indian Rupees if purchase order to be placed to them. It is the responsibility of Indian firm to pay custom duty etc. IMD shall not be responsible for custom clearance .Prices quoted by the tenderer shall remain firm and fixed during the currency of the contract.
Bids on High Sea Sale based are not permitted/ not allowed. Such financial bid shall be straightway declared unresponsive and not be considered for financial evaluation.
- (x) Foreign bidders, for **imported goods** if supplied directly from abroad, prices shall be quoted on **FOB value basis** in any freely convertible currencies.
- (xi) **Indian firm** (agent/ authorised supplier /dealer/ subsidiary/ integrators/ Distributors/ Stockist etc) **quoting prices in foreign currency and payment has to go to his foreign principal, then Indian firm must have enlistment with DGS&D. Indian firm shall not be paid in foreign currency.**
- (xii) Supplier /Integrator /Distributors /Stockiest registered with DGS&D for imported stores shall quote in INR only if they are not enlisted with DGS&D & no payment shall be made to their foreign principal.
The enlistment is not equivalent to the Registration with DGS&D. Registration with the DGS&D shall not be treated as Enlistment if Indian firm quoting in foreign currency also on behalf their foreign principal.
- (xiii) Statutory levies, taxes and duties etc., if any, chargeable on the goods are payable on actual basis as applicable.
- (xiv) If there is a discrepancy between the amount expressed in words and figures, the amount in words shall prevail.

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.

8. Signing and Sealing of Tender :

A tenderer shall submit two copies of its tender marking them as **“Original” & “Duplicate”**. Duplicate tenders must contain all pages including Technical Literature/Catalogues as in Original tenders. **The original set of tender shall contain all papers and documents etc. in original. The tender shall have the signature of the authorised person with the seal of firm.** The tender shall not contain any erasure or overwriting, except as necessary to correct any error made by the tenderer and, if there is any such correction; the same shall be initialled by the person(s) signing the tender.

The tenderer is to seal the original and each copy of the tender in separate envelopes, duly marking the same as “Original” and “Duplicate” and writing the address of the purchaser given below and the tender reference number i.e. **Tender enquiry No. CPU/...** on the envelopes. The sentence “NOT TO BE OPENED” before _____ (The tenderer is to put the date & time of tender opening) are to be written on these envelopes. The inner envelopes are then to be put in a bigger outer envelope, which will also be duly sealed, marked etc. as above. If the outer envelope is not sealed and marked properly as above, the purchaser will not assume any responsibility for its misplacement, premature opening, late opening etc.

Envelope should be sent at address:

Director (CPU)
O/o Director General of Meteorology,
India Meteorological Department,
Lodi Road, New Delhi-11003

TE document seeks quotation following **two bid systems**, in two parts. First part will be known as **‘Techno - Commercial Bid’**, and the second part **‘Price Bid’**. Tenderer shall seal **‘Techno - Commercial Bid’** and **‘Price Bid’** separately and covers will be suitably super scribed. Both these sealed covers shall be put in a bigger cover and sealed.

9. SUBMISSION OF TENDERS :

The tenderers are to drop their tenders in the tender box kept for this purpose at a place as indicated in the Tender Document. In case of bulky tender, which cannot be put into tender box, the same shall be submitted by the tenderer by hand to the nominated officers of the purchaser.

Late Tender A tender, which is received after expiry of the specified date and time for receipt of tenders, will be treated as “late” tender and will be ignored.

10. Alteration and Withdrawal of Tender

The tenderer, after submitting its tender, is permitted to alter / modify its tender so long as such alterations / modifications are received duly signed, sealed and marked like the original tender, within the deadline for submission of tenders.

No tender should be withdrawn after the deadline for submission of tender and before expiry of the tender validity period. If a tenderer withdraws the tender during this period, it will result in forfeiture of the earnest money furnished by the tenderer.

11. 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 tenderers, who have submitted tenders on time may attend the tender opening, provided they bring with them letters of authority from the corresponding tenderers. 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 tenderers only shall be opened for further scrutiny and evaluation on a date notified after evaluation of the techno commercial tender.

12. SCRUTINY AND EVALUATION OF TENDERS

(1). **Unresponsive bids:**

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 followings are not provided along with technical bids.

- (i) Tender is unsigned.
- (ii) Checklist (annexure-I) not enclosed.
- (iii) Tender Acceptance Form (annexure-II) not duly signed and stamped. **(i:e all the terms & conditions of tender document are acceptable.** Letter should be original and not the scanned/photo copy with original tender submitted by the tenderer)
- (iv) Tender validity is shorter than the required period.
- (v) Required EMD has not been provided.
- (vi) Tenderer has not agreed to give the required performance security.
- (vii) Proof of enlistment with Department of Expenditure, Ministry of Finance through DGS&D not attached with the tender (in case Indian agent quoting on behalf of its foreign principal).
- (viii) Copy of agreement of Indian agent with its foreign principal with the precise relationship between them and nature of services which would be available from Indian agent. Copy of this agreement must be attached with the tender.

(2). **Technical Evaluation:**

Tenders shall be scrutinized and evaluated by the committee constituted by competent authority with reference to parameters prescribed in the TE document.

Minor Informality/Irregularity/Non-Conformity:

If during the preliminary examination, the purchaser find any minor informality and/or irregularity and/or non-conformity in a tender, the purchaser may waive the same provided it does not constitute any material deviation and financial impact and, also, does not prejudice or affect the ranking order of the tenderers. Wherever necessary, the purchaser will convey its observation on such ‘minor’ issues to the tenderer asking the tenderer to respond by a specified date. If the tenderer 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.

(3).Financial evaluation: Thereafter, in the second stage, the Price Bids of technically qualified tenderers only 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-1) on the basis of ultimate landing cost. **Wherever, against a requirement, both indigenous as well as imported offers are received,** the offers for imported stores will be

evaluated on the basis of the total landed cost after loading the custom duty and other levies etc as may be applicable from time to time for taking purchase decision.

The ultimate/landing cost in respect of store is arrived at by considering following below elements:

(A) Indigenous stores

1. Basic price
2. Excise duty (if applicable)
3. Sale tax , service tax & other applicable taxes
4. Insurance, freight and transportation of goods up to sites

(B) Imported stores

1. Total Net FOB price in foreign currency of the project.
2. Ocean/Air Freight and Insurance charges (@10% of FOB price of shipment of stores coming through customs.
3. Custom Duty in India (if not exempted i:e if consignee has mentioned in technical requirement to provide custom exemption certificate).Custom Duty Custom duty are applicable on hardware, software, Equipments, instruments, consumables and other items etc coming through customs Clearance). Custom duties on services are not levied.
4. Landing clearing and Bank charges @1.0% of total net FOB price of the project.
5. plus actual Inland freight/insurance/transportation of goods upto the user sites quoted by bidder.
6. Service tax applicable in India.

Conversion of currencies to Indian Rupees for Comparison of Tenders

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

13. Packing and Marking :

The packing for the goods to be 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.

14. Inspection, Testing and Factory acceptance test(FAT)

The purchaser's/consignee's reserve the right to inspect goods before their dispatch if required in technical requirement.

Goods accepted by the purchaser/consignee and/or its inspector at initial inspection and in final inspection in terms of the contract shall in no way dilute purchaser's/consignee's right to reject the same later, if found deficient in terms of the warranty clause of the contract.

Purchaser will not undertake any Pre dispatch inspection ,unless mentioned, for imported stores in the suppliers country of origin and equipment will be sent to the supplier on the basis of supplier 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.

SECTION – III

GENERAL CONDITIONS OF CONTRACT (GCC)

1. Unsigned Offers or offers with scanned signature will be rejected. Scanned offers and offers not ink-signed in price part are not acceptable and such offers shall be rejected out rightly without any further reference to the tenderer.
2. Whenever there is any conflict between the provision in the GCC regards to specific para under this section and that in the “List of requirements/ technical specifications” section, the provision contained in the “List of requirements/ technical specifications” section shall prevail and have an over-riding effect.
Any Special instructions as per “List of requirements/ technical specifications” section will also apply for this purchase. The conditions (like delivery schedule, mode of delivery & sites of delivery etc.) mentioned in “List of requirements/ technical specifications” section will apply for this purchase.
3. **Eligibility & Qualification criterion for Tenderers:** Firms in followings categories are eligible to participate in tender subject to fulfil any other specific qualification criteria mentioned in technical requirement section.
 - (i) Original Equipment Manufacturer (OEM) .
 - (ii) Original Software Company (OSC) , who developed the main application software .
 - (iii) Authorized Supplier from Original Equipment manufacturer (OEM) /Developer of main application software company (OSC) etc. The tenderer shall have to submit authorization certificate from OEM /OSC etc. that they will provide service support after sale.
 - (iv) Integrators/ Authorized dealer/ Supplier/ subsidiary/ Distributors/ Stockist having full back to back maintenance support agreement for hardware & software from OEM & OSC etc.
 - (v) Foreign tenderer registered in their countries.
 - (vi) **Indian firms quoting on behalf of foreign principal:**
 1. Indian Firm (Agent/ authorized dealer/supplier/subsidiary/Integrators Distributors/ Stockist etc. of their foreign firm) quoting **in foreign currency on behalf of their foreign principal (i:e payment has to be made to their foreign principal in foreign currency) must be enlisted with Department of Expenditure, Ministry of Finance, and Government of India through DGS&D.** Authenticated copy of Enlistment certificate must be attached with the tender. Original shall be shown at the opening of bids.
 2. 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 Indian agent, shall be submitted along with their tender. Whether foreign principal has agreed to provide technical support and spares after sale services. The type and nature of after sales services to be rendered by the Indian Agent.
 3. Either the Indian firm on behalf of their foreign principal or the foreign principal directly bid in a tender **but not the both.**
 4. Price to be quoted in Indian currency towards portion of allied work and services which are to be undertaken in India (like installation & Commissioning of equipment).

5. The complete name and address of the Indian agent and its permanent income tax account number (PAN) as allotted by the Indian Income Tax authority must be submitted.
6. The enlistment under the scheme is not equivalent to the Registration with DGS&D. Such firms do not enjoy the same status as that of DGS&D registered suppliers.

Supplier /Integrator /Distributors registered with DGS&D for imported stores shall quote in INR only & no payment shall be made to their foreign principal. **Bids on High Sea Sale based are not permitted/ not allowed.**

4. **Alternative Tenders :**

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

5. **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.

6. **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 tenderer or tenderers.

7. **Tender Fee:**

The bidder shall have to submit tender fee as mentioned in notice inviting tender (NIT), however Micro and small Enterprises registered with government bodies specified by Ministry of Micro , Small & Medium Enterprises (MoMSME) are exempted for submitting the tender fee.

8. **Price preference:**

Price preference shall be given to **Micro and Small Scale Industries** registered 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 tenderers shall have to attach valid registration certificate along with balance sheet indicating turnover etc for the previous financial year. 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. Micro and small Enterprises shall have to furnish performance security if purchase order is placed to them. There is no relaxation in this regard.

9. **Earnest Money Deposit (EMD)**

The tenderer 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 tenderer's unwarranted conduct.

The tenderers who are registered on Tender submission date with Directorate General of Supplies & Disposals or with National Small Industries Corporation, New Delhi, shall be eligible for exemption from EMD. **Micro and small Enterprises** specified by Ministry of Micro , Small & Medium Enterprises (MoMSME) **are exempted from earnest money deposit (EMD). EMD also known as security deposit.**

The EMD shall be furnished in Fixed Deposit Receipt (FDR) or Bank Guarantee (BG) (as per annexure-IV)) 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.

Refund of EMD: Unsuccessful tenderers’ earnest money will be returned to them **without any interest**, after expiry of the tender validity period. Successful tenderer’s earnest money will be returned without any interest, after receipt of performance security from the tenderer. The tenderers have to submit pre receipt for obtaining their EMD in the **FORM GAR 43D** (annexure-V) in duplicate with original signatures. One form should be affixed with revenue stamp.

Forfeit of EMD: Earnest money of a Tenderer will be forfeited, if the tenderer 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 tenderer’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

1. Within twenty one (21) days from date of the issue of notification of award by the purchaser, 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 AMC if any, valid up to sixty (60) days beyond the warranty period.
2. The AMC service provider shall furnish performance security to the purchaser for an amount equal to five per cent (5%) of the total value of the AMC Value, valid up to sixty (60) days after the date of completion of all contractual obligations by the supplier/service provider.
3. **Performance Security has to be submitted irrespective of its registration DGS&D/NSIC etc. Performance security is not relaxed to any supplier/service provider. Submission of Performance Security is must for all suppliers/service providers.**
4. It shall be in any one of the forms namely Fixed Deposit Receipt or Bank Guarantee drawn/issued 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.** Foreign tenderer may submit in the form of Bank Guarantee. **Bank Guarantee issued from the foreign banks must be authenticated by STATE BANK OF INDIA or any other Nationalized Bank of India.**
5. 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 AMC (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 specified in the tender enquiry document. Generally it is **F.O.R destination** (in case of domestic supply) and **F.O.B** in case of foreign supplier. Time for inland transportation in India by foreign supplier for Installation and commissioning etc of stores shall be taken from the date on which stores are handed over to supplier by IMD after custom clearance. Suppliers should not deliver the goods without any valid delivery period. Purchaser shall not be held responsible for any thing (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 technical section.

Date, on which all the stores as per supply order have been delivered to the consignee, shall be treated as 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 **Onsite warranty**. All stores to be supplied 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 and Octroi etc, for sending defective parts for repairs and sending back repaired or replaced one to IMD site(s), shall be borne by supplier itself.

Other condition under warranty clause of “List of requirements/ technical specifications” section shall also be applicable.

15. Annual Maintenance Contract:

The Purchaser/Consignee reserves the rights to enter into Annual Comprehensive Maintenance Contract between Consignee and the Supplier after the completion of warranty period. Maintenance contract may be entered into with the supplier. If the maintenance contract is required with the supplier of the goods, **the cost component towards AMC are to mentioned and added in bid by tenderers for its evaluation on overall basis to decide the ranking of tender.** Generally, payment for maintenance contract is made on quarterly basis if not specified in technical requirement section. The supplier shall enter into agreement with consignee if required.

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

1. 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 contract. **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.**

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.

Once the maximum is reached purchaser may also consider followings:

- (i) Forfeiture of its 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. site is ready in all respect (i:e all civil & electrical at site completed) for installation of stores.
- (c) Delay in providing No Objection Certificate (N O C) required from any other government agency/agencies.
- (d) Communication facility to be provided to the supplier by the consignee.
- (e) Any other reason for which supplier is not responsible.

Penalty/Liquidated damages shall be calculated on the purchase/contract price including the element of sales tax, excise duty, service tax etc mentioned in the price bids.

2. (a) *Penalty/Liquidated damages shall be calculated on the purchase/contract price including the element of sales tax, excise duty, service tax etc mentioned in the price bids.*
(b) *Custom duty shall not be taken for the purpose of Penalty/LD calculations.*

3. The supplier shall not be held responsible for any delay in custom clearance by purchaser, handing over proper site by consignee and any other delay in part of consignee/purchaser if responsible. These periods shall not be counted in LD. 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 despatch. 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 (CPU) directly in writing about these delays on part of IMD.**

17. Award Criteria and Tolerance Clause:

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 upto plus minus fifteen percent (+ - 15%) till the placement of supply/purchase order or contract without any change in the terms & conditions and prices quoted by the tenderers

18. Modification of contract

If necessary, the purchaser may, by a written order given to the supplier at any time during the currency of the contract, amend the contract by making alterations and modifications within the general scope of contract. 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. Custom Duty

Custom clearance shall be done by IMD through its clearing agent if purchase order is placed to foreign supplier. IMD shall pay the custom duty on imported goods. Foreign supplier or its representative shall assist in the process and provide the entire required document for custom clearance of the goods.

IMD shall not have any custom responsibility in case of supply order placed to Indian supplier for imported stores. **Bids on High Sea Sale based are not permitted/ not allowed.**

20. Taxes and Duties in India:

(1) Duty and Local Taxes:

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. Wherever required, they should obtain the exemption certificate from the indenter /consignee concerned, to avoid payment of such local taxes or duties. 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.

Supply of Road Permits by the indenter /consignees: 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: -

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

(b) On receipt of the above request from the supplier, the indenter/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 5 days from the receipt of invoice.

(c) The supplier shall pay the local charges/taxes (Octroi etc.) if exemption certificate not agreed by local authority and same will be reimbursed by purchaser on submission of receipt.

The supplier shall not be held responsible for any delay in supply due to non- supply/delayed supply of Road permit.

(2) **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 (foreign as well as Indian tenderers) 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) and TAN. Firm may also mention the applicable rates of TDS as per DTAA with India. Copy of same may also be enclosed. Foreign vendor shall have to mention the details of establishment in India if any.

21. 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.

1. Cases where installation & Commissioning not to be done by bidder

(i) Domestic goods:

100 % payment shall be made to domestic supplier in Indian currency on receipt of entire goods/stores at sites and acceptance by consignee. No payment shall be made for partial delivery. The following documents shall be submitted:

- (i) Three copies of supplier's invoice showing contract number, goods description, quantity, unit price and total amount.
- (ii) 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.

(ii) Imported Goods:

Ninety (90) % payment, against proof of despatch of goods/stores as per S.O, shall be paid through irrevocable, non-transferable Letter of Credit (LC) opened in favour of the foreign supplier and upon submission of following documents:

- (i) supplier's commercial invoice showing contract number, goods description, quantity, unit price and total amount
- (ii) Original on-board Bill of Lading/Air way billing
- (iii) Copies of packing list identifying contents of each package
- (iv) Manufacturer's/Supplier's warranty certificate
- (v) Inspection certificate issued by the nominated inspection agency, if applicable as per contract
- (vi) Manufacturer's own factory inspection report
- (vii) Certificate of origin
- (viii) Insurance certificate
- (ix) Port of Loading
- (x) Port of Discharge
- (xi) Expected date of arrival

Balance payment of 10 % of net FOB price of goods would be made against 'Final Acceptance Certificate' to be issued by the consignees.

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

Seventy percent (70%) of **contract value of stores** after proof of despatch of complete foreign goods or receipt of goods at sites in case of domestic goods and balance 30% payment towards stores after their successful installation and acceptance at site.

- (i) 100% payments towards services like FAT, Training, SAT, Installation & commissioning charges etc if any after their executions and completions.
- (ii) Necessary documents must be submitted for the release of payments.

3. Payment to the foreign supplier shall be made through IRREVOCABLE LC .LC shall be established for a specific period depending on delivery schedule only after receipt of unconditional acceptance 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.

4. Payment towards Annual Maintenance Contract Charges:

Payment shall be made as per "List of requirements/ technical specifications" section. The consignee will enter into AMC if required for selective items with the supplier at the rates as stipulated in the contract after warranty period .The payment of AMC will be made after satisfactory completion of said period and duly certified by the consignee. The consignee shall deal this issue separately and directly. The supplier shall deal AMC agreement and payment etc directly with the consignee.

5. The supplier shall send its claim for payment in writing, when contractually due, along with relevant documents etc., duly signed with date, to respective consignees.
6. Bills/invoices must be submitted separately for stores and services.
7. 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 (f) MICR No. (g) Telephone No.(h) SWIFT code etc.

22. 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 would be refunded by the BIDDER to the BUYER (India Meteorological Department) or it will be adjusted from their bills, if the contract has already been concluded.

23. Termination of tender by the Purchaser:

From the time of submission of tender to the time of awarding the contract, if a tenderer 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 tenderer attempts to influence the purchaser in the purchaser's decision on scrutiny, comparison & evaluation of tenders and awarding the contract, the tender of the tenderer shall be liable for rejection in addition to appropriate administrative actions being taken against that tenderer, 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.

24. 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. **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.

CHECKLIST

S. N	Activity	Compliance Yes/ No/ NA	Page No. of your bid
1	Whether bidding firm is registered with Government bodies in their country. Is Credential/ document attached with technical bid?		
2.	(i) Is DD enclosed for tender fee?		
	(ii) Have you enclosed EMD (Bank Guarantee /FDR) of required amount?		
	(iii) Is the EMD submitted by other firm other than participating firm? If yes, then bid is likely to be ignored.		
	(iv) Is Registration certificate from DGS&D /NSIC attached for relaxation of EMD?		
3.	Have you kept validity of your bid as per the TE document?		
4.	Have you enclosed <u>Tender Terms & Conditions Acceptance Form</u> duly filled and signed (i:e terms and conditions are acceptable) with original set of tender. Tenders may be ignored if not signed.		
5.	Have you enclosed clause-by-clause <u>compliance statement</u> for the “List of requirements/ technical specifications” section?		
6.	Have you submitted copy of the last purchase order(s) and end user certificate?		
7.	(i) Is tender Submitted by an OEM?		
	(ii) Is tender Submitted by an authorized Agent/Dealer/Supplier/Distributor/ Stockist of OEM? Is authorisation certificate attached?		
	(iii) Is tender Submitted by an integrator Agent/Dealer/Supplier/Distributor/ Stockist of OEM? ? Whether Back-to-back support agreement with equipment manufacturer and software developer company attached?		
	(iv) Is tender submitted by Indian firm quoting on behalf of foreign principal: Is proof of enlistment with DGS&D attached along with agreement with their foreign principal?		
8.	(i) Permanent Account No. of bidding firm with proof.		
	(ii) Is sales & service tax number with registration certificate attached?		
9.	Name of the firm who quoted the price		
10.	Name of tender currency		
11.	Name of the supplier with complete address to whom supply order to be placed.		

**(Signature with date and firm/company seal)
(Full name, designation on behalf of the Tenderer)**

TENDER 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: 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 “List of requirements/ technical specifications” section.

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.

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 agree to 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.

MANUFACTURER'S AUTHORISATION FORM

(Bidders, quoting products other than his own manufactured products, shall submit this certificate in following format)

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

Dear Sir,

We, _____ who are proven and reputable manufacturers of _____ (name and description of the goods offered in the tender) having factories _____ at _____, hereby authorise Messrs _____ (name and address of the agent) to submit a tender, process the same further and enter into a contract with you against your requirement as contained in the above referred TE documents for the above goods manufactured by us.

We hereby confirm that we shall provide all service and maintenance support during warranty and AMC (if any) period for the goods and services offered for supply by the above firm.

Yours faithfully,

[Signature with date, name and designation]

for and on behalf of Messrs _____

[Name & address of the manufacturers along with Seal of the firm]

Note: This letter of authorisation should be on the letter head of the manufacturing firm and should be signed by a person competent and having legal binding to the manufacturer (original letter to be attached or to be shown at the time of opening of bids).

**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 unto
(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 of
.....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:-
 - a) If the tenderer fails to furnish the Performance Security for the due performance of the contract.
 - b) Fails or refuses to accept/execute the contract.

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

This guarantee will remain in force upto and including 60 days after the period of tender validity and 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

**O/O Director General of Meteorology
Lodi Road, New Delhi-110003**

**FORM
GAR 43D**

[See Rule 186(1)]

APPLICATION-CUM-BILL FOR REFUND OF DEPOSIT

MONTH.....

BILL NO.

Original Challan or Receipt No. & date	Bank/Office in which deposited	Name of depositor	Amount deposited	Originally
1	2	3	4	

Received this day of20..... the sum of
Rs. (Rupees.) only
being repayable on Account of release of deposited described above.

Claimant's Signature.
(with revenue stamp affixed)

For use in Departmental Office

1. Received payment of Rs..... (Rupees.....) for arranging disbursement to claimant.
2. Passed for Payment of Rs.(Rupees) to claimant(s) Shri/Smt./Ms..... against personal deposit account administered by me.

Dated.....

Assistant Meteorologist (DDO)
For Director General of Meteorology
In case of endorsement of above

For use in Pay & Account office incase of endorsement of 1 above

Passed for payment of Rs.
Payment by Cheque No.

Pay & Account Office

SECTION

(RFP: List of requirements & Technical specifications)

RFP DOCUMENT FOR

DESIGN, DEVELOPMENT, MAINTENANCE OF DYNAMIC, CMS AND GIS BASED CENTRAL IMD WEBSITE INCLUDING SUPPLY, INSTALLATION, COMMISSIONING OF SERVERS, DESKTOP COMPLETELY FUNCTIONAL WITH GIS & SYSTEM SOFTWARE SUPPORTED BY INTEGRATED DEVELOPEMENT ENVIRONMENT AND ASSOCIATED INFRASTRUCTURE ITEMS ON TURN KEY BASIS.

TABLE OF CONTENTS

Sl. No.	Chapters	Details
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2	Chapter 2	Objectives
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4	Chapter 4	Technical specifications
5	Chapter 5	Qualification criteria
6	Chapter 6	Delivery Schedule
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8.	Chapter 8	Terms and Conditions
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	Annexure-B	General Information

Chapter 1

INTRODUCTION

India Meteorological Department is an attached Office of Ministry of Earth sciences. The Department is mandated to provide following meteorological service to the nation in the areas of weather forecasting, Climatology, Hydrometeorology, Instrumentation, Agricultural Meteorology, Civil aviation, Meteorological Telecommunication, Regional Specialized Meteorological Centre, Positional Astronomy, Satellite Meteorology, Seismology, Marine Meteorology, Radar Meteorology, etc.

- To take meteorological observations and to provide current and forecast meteorological information for optimum operation of weather-sensitive activities like agriculture, irrigation, shipping, aviation, offshore oil explorations, etc.
- To warn against extreme and severe weather phenomena like tropical cyclones, nor'westers, dust storms, heavy rains and snow, cold and heat waves, etc., which cause destruction of life and property.
- To provide meteorological statistics required for agriculture, water resource management, industries, oil exploration and other nation-building activities.
- To conduct and promote research in meteorology and allied disciplines.
- To provide various seismology related services including monitoring of earthquake activity in and around the country and generate hazard related products.

As a part of E-Governance initiative, it maintains a web-site with URL <http://www.imd.gov.in>. The bilingual version of the web-site is hosted at the IMD HQ. The website at present is having approximately 400 pages and is maintained in-house by IMD. The data for website is uploaded and updated on the daily basis/ at various intervals by concerned division and various field units of IMD. Satellite images and derived products of INSAT/NOAA/Metop/MODIS satellites are updated on half –hourly / hourly basis. In Time to time update of products are uploaded on web site.

The following related data, products and services are provided by the existing website of IMD.

- | | |
|--------------------------------|--|
| • Current weather information | • Agromet Advisory |
| • Weather forecast | • Satellite Imagery and satellite Products |
| • Agromet forecast | • Radar imagery and Radar Products |
| • Seismic information | • Cyclone Information |
| • Severe weather advisory etc. | • Other miscellaneous information |

(like Tenders, Press Release, Advertisement etc.)

In view of paradigm shifts in ICT, it is intended to design, develop and maintain a new data and data products enriched, GIS enabled, CMS based, dynamic website to strengthen and perform operational decision system for extreme weather events such as severe cyclones, significant earthquakes, severe depressions, large scale flooding (urban), Extremely heavy Rainfall, generate timely agro advisories on real time basis etc, in addition to providing normal weather information to all the stakeholders on 24X7 basis round the year.

The GIS based database of IMDs observation system will be broadcasted in the form of maps of soil type, soil moisture, soil temperature, air temperature, humidity, rainfall, wind, cloud, hours of sunshine and crop condition, pest and diseases infestation status, flood prone zone, drought and aridity, maps showing monsoon activity, cyclone tracks superimposed on satellite and radar imageries, areas likely to be inundated due to approaching cyclones, floods due to heavy rains during monsoon, Isohytal maps for all the river basins of India as well as tables which will be easy to visualize, share, analyse various real time meteorological data parameters and Agromet products.

Chapter 2

OBJECTIVES

The main objective of website would be to provide accurate, reliable, near real time information dissemination, improved electronic delivery of services to associated organizations, citizens, international users in efficient and user friendly manner. The efforts towards new GIS based content managed Website should be in pursuit of excellence, quality and efficiency in site navigation with following characteristics.

- It should be secured from phishing, hacking, tempering and other malicious threats.
- The access to the contents should be logical and available with minimum number of clicks.
- It shall be in compliance with the “Guidelines for Indian Government Websites (GIGW)” and should be compatible with the international standard for physically challenged persons.
- It should have CMS (content management system) features.
- It should be accessible from all devices like desktops, laptops, tablets, mobile smart phones, hand held devices, disabled specific devices etc. running on various platforms.
- The new Website will serve as a single point repository for all weather related information.
- The information search on the site should be optimized and scalable.
- The meteorological data format is to be converted into appropriate and unified database structure i.e. it should save the attribute and map data within a single database file.
- Conversion of meteorological data into the appropriate OGC Compliant GIS format (**WGS84**) in an operational environment.
- Development of the applications for displaying maps in the existing data formats in IMD with 1:10,000 scale or better for all weather related parameters.
- Acquisition of satellite images and products in standard map projections.
- Acquisition of satellite images (Jpeg, tiff, png etc) /digital data (HDF-5) in standard projections with proper navigation accuracy over a GIS platform having provision to overlay different type of boundaries (such as district and block level) on selected areas.
- Provision for animation (with morphing facility) of satellite images and products with selection of satellites, channels, type of images/products (full frame, sectors etc) of user defined time period.
- Provision to add a layer of annotation over the satellite images and products.
- To provide various seismic information including display of source parameters of earthquakes on different map layers, such as, political boundary map (approved by Survey of India) upto district level, Physical map, seismic zoning map, tectonic/geological map and seismic network map.
- Display of Meteorological information, weather charts, Agromet Advisories, Warning at Block level on All India maps certified by Survey of India with current state, District., Block & International boundaries
- Web enabled GIS
- Publish the data on the web that is accessible to the managers, decision makers readily available round the clock.
- Dynamic linking
- Dynamic linking of meteorological data to see real time scenarios and predict the destructiveness of natural disasters and its impact on other allied sectors like agriculture, aviation, etc.
- Search and display information for the database as per selection like event wise, time wise, area wise, year wise, month wise etc.
- Provide services to mobile users registered with website for specific information, press release, warning etc. in real time soon on upload.

Chapter 3

SCOPE OF WORK

The Scope of work includes the design and development of the state-of-the art CMS and GIS based Central website of IMD. The website shall host the website (webpages) related to all individual Six RMCs, State Meteorological Centres, Positional Astronomy Centre Kolkata, Pune and other Important offices of IMD. The provision for update, entire administration and control etc. should lie with respective offices (RMCs, MCs, PAC, Pune and other important offices etc.) in addition to central administrator. Option for edit, view, display, archival, various level of administration etc should be there.

A brief detail of the activities undertaken by IMD for providing data, product and services on proposed IMD website are as follows:-

1. Surface and Upper Air data

The collection of Meteorological observations data from the surface, AWS, ARG, Ozone, Radiation, Agromet observations, RS/RW and Pilot Balloon data for Upper Air temperature, Pressure, Relative Humidity, Wind speed & direction etc. New data sets from IPWV radiometer, Air pollution summery and display on the website.

2. Satellite Imagery

This division of IMD is responsible for generating the images and data products by satellite in last 24 hours. These images and data products are displayed on the basis of refresh rate prescribed by IMD. These images are dynamically uploaded into the shared location and hence are circulated as per requirement. If required, the shared file server can store the record of historical images, which can be retrieved as and when required. Satellite images of various kinds presently available can be seen on our existing website www.imd.gov.in .

3. Radar Imagery

This section will contain and display the images generated through the radar network of IMD. Similar to the satellite images, these images can also be dynamically retrieved from the shared file server.

IMD is currently operating a network of 40 radars. These can be further classified as follows:

- Cyclone Detection Radars (CDRs) –S-band
- Storm Detection Radar (SDR) – X-band
- Multi-Met Radar (MMR) – X-band
- Doppler Weather Radar(DWR)[METSTARS, GAMATRONICS, BEL, VAISALA etc.]

These images are categorized on the basis of station and the type. All concerned stations using our centralized website can upload images into centralized file server and the same will be displayed when a visitor goes into radar imagery section.

4. RMC/ MC/ MO/ AMO Linkages

This section will provide link to RMCs and MCs home pages/ website. All RMCs and MCs with their controlled access login can upload their observations/data to the centralized repository. This can be done by them either through data entry forms or data upload. This section will also showcase their hierarchy and a RMC/MC/MO/AMO can directly enter the section related to them according to their authentication.

5. SMS/ Broadcast/service message alerts

Whenever there is need to publish alerts to general public, IMD can do so by uploading the alert message on their website. Here there is a need to develop a web service which will send the message to telecom service provider in a required format. The service provider will in turn publish/broadcast the same to the general public specific to the target area after chalking out the target audiences.

6. Weather Forecasting

Following weather services need to be provided / published right down to the Block district level.

- Current weather information for various parameters.
- The plot of last one month for maximum temperature, minimum temperature, and relative humidity
- Weather Forecast
- Short range Forecast up to 3 days
- Medium range forecast from 03 to 10 days.
- Historical Weather
- Extended range forecast up to one month

- Severe weather advisory
- Astronomical information
- Visibility information for places having airports
- City Weather
- Climate Data
- Display of live Runway Visual Range(RVR) of airports in the region.
- Weather forecast for special services i.e. Health, power sector, tourism, pilgrimage etc.
- Link for special report.
- Nowcast products
- NWP products
- Miscellaneous

The satellite module will also have provision for animation of selective satellite images upto last seven days. There will also be a provision for viewing images till last month

- Doppler Weather Radar imagery and products
- Animation for cyclones, depressions, heavy rainfall, significant weather events etc. for selectable variable frames.

7. Severe Weather Warnings

IMD generates severe weather advisory in case of cyclones, squall, thunderstorm, Extremely heavy rainfall, heat wave condition, cold wave condition, storm surges etc. System will provide the feature to edit the information and automatically publish on the web. The presentation of data also needs to be state of art as per institutional norms. The following information will be made available on the website.

- **Cyclone information:** (i) 3 hourly cyclone tracks & intensity along with cone of uncertainty valid up to 120 hours. (ii) Wind distribution in a cyclone and its forecast upto 120 hrs. (iii) Adverse weather warning such as heavy rain, gale wind, storm surge and coastal inundation. (iv) NWP guidance on cyclone including individual NWP model forecast, Multi Model Ensemble, Ensemble Prediction system (EPS) of various global and regional Models, Cyclone Specific model like Hurricane WRF model, storm surge model forecast and coastal inundation model forecast. (v) Marine weather forecast like sea surface wind, wave heights etc.
- Severe weather information for next 120 hours on squall, severe thunderstorm, heavy rainfall, heat wave condition, cold wave condition, fog and storm surge.
- provision to display cyclone track over current satellite image

8. Aviation Meteorological Services

This section is restricted to only airline pilot and Aviation Met/Airport officials and special Login would be provided for the same. This section would provide different charts and weather forecasts to pilots as per their flight plan. This module will have special logins and data would be received from FTP server for online briefing of the airlines and pilots on 24x7x365 days basis.

Aviation related data such as METAR (meteorological report), SPECI (special meteorological report), TAR (Terminal aerodrome forecast), etc, should be made available to the users.

9. Cyclone Warnings

The cyclone related products to be hosted on the website shall be of two types, viz., dynamic and Static. The static page shall provide information about RSMC New Delhi/ Cyclone Warning Division, various publications, awareness about cyclones and archival. The dynamic page shall contain information regarding past and future track, intensity, cone of uncertainty, wind distribution in quadrants, Four Stage Warnings/Advisories, Cyclone Warning Graphics, Marine forecast / warnings, Diagnosis / Prognosis, NWP Model Products, Satellite and Radar Products etc. All the graphical products should be GIS based. Details of the products are given under section K.

10. Disaster Warning

The warnings module is highlighted in left hand corner of the home page. The module is proposed to show following types of warnings:

- Cyclone Warnings (including Heavy rainfall warning, gale/squall wind warning, storm surge & coastal inundation warning, Port warnings, Fishermen warnings, coastal weather bulletins, Sea Area Bulletin, GMDSS Bulletin)
- Agromet warnings
- Heavy Rainfall Warnings

- Tsunami Warnings (Warnings are issued by INCOIS, Hyderabad. Hence, a link to INCOIS Website to be provided)
- Heat/Cold Wave Warnings
- Other severe weather warnings and Disaster warning
- Thunderstorm Warnings

This module will receive warning data from each of the individual modules like cyclone, flood met and rest of the warnings would be uploaded in severe warning folder in directory structure. The cyclone warnings will be uploaded by Cyclone Warning Division at HQ and Area Cyclone Warning Centres at Mumbai, Kolkata and Chennai and Cyclone Warning Centres at Visakhapatnam, Ahmedabad and Bhubaneswar.

11. Rainfall Products

Hydromet division of IMD is responsible for generating the Rainfall Reports for various Meteorological Subdivisions, States, Districts, the four broad regions of India and for the country as a whole at specified temporal scales (daily, weekly, seasonally cumulative, monthly, seasonal and annual), in tabular as well as pictorial form. The division also provides quantitative precipitation forecasts based upon IMD's WRF and MME model forecasts, for various river basins and sub-basins. These documents are presently available at 'Hydrology' link on IMD's existing website. The details of the products which need to be incorporated in the scope of work for the proposed website are given under 'Hydrology' para on page 15 of this document.

12. Decoders

Suitable Decoders, wherever required, needs to be incorporated separately for interpreting WMO/ ICAO/ proprietary coded information

- AWS - (675 Automatic Weather Station) Hourly message
- Upper wind Pilot and EPH code
- Ship Weather data
- Aviation Weather message
- Weather Forecast messages
- ARG - Automatic Rain Gauge (1350 Stations) System Hourly messages. All the licenses/upgrades should be provided for lifetime of the system.

All the above information (from S. No. 1 to 11) to be displayed on IMD new website should have GIS features. The **proposed GIS based weather information** to be made available on the new site would help general public to reduce/minimize loss to life and property. The new GIS based system should combine weather information and GIS to facilitate the continuous monitoring of multiple weather parameters against geographical assets, and automatically trigger active alerts when critical thresholds are exceeded. To achieve this, it is proposed to develop the active location based weather alerts in time and space for the following aspects:

- Spatial alerts:
 - Alerts for specific points(fixed or mobile)
 - Alerts along line segments
 - Alerts for specific geographic areas.
- Temporal Alerts:
 - Alerts to future forecasted weather conditions
 - Alerts for agricultural operations in extreme weather conditions

IMD further intends to provide all weather and climate related data, data products, GIS layers, services in Hindi language. Hindi version shall be Unicode complaint. The front-end as well as the back end administrator panel shall be complaint to handle the multi-lingual requirements. The Hindi version website should have all the contents including dynamic, CMS, static pages and GIS. There should be a provision to publish the data /products in open data format like KML, CAP, GeoRSS etc. Administrator should be allowed to enter content for all the CMS pages separately in Hindi. About **5000** concurrent users or more are expected to use the proposed application from 2014 to 2020.

Scope of work shall include the following:

1. Entirely new designing and revamping the existing website with corporate theme design following the latest web trends along with migration of existing pages in consultation with IMD.
2. The bidder will restructure overall content with proper tagging to make them screen reader friendly. There will be separate sections for:

- About IMD, Mandate, history, Organization, recent advancements, leaders, services, data and products provided by IMD (as mentioned at S. No. 1 to 12 as per Scope of work above)
 - Financial results/ reports.
 - Video Capsule on Weather upload
 - Audio Capsule on Weather uploads
 - Audio/Video submission by Mobile/Internet for significant weather.
 - **FAQs** : Frequently asked questions to provide the website the ability to quickly introduce the content of the site to an unfamiliar user.
 - Press Release/Warnings Display scrolling message.
 - Citizen Charter
 - Miscellaneous
 - Arrangements
- (i) Information manual for RTI, 2005
(ii) Public Grievances, (iii) Learn Meteorology, (iv) Senior Officers of IMD, (v) Immovable property return, Telephone Directory(Hindi, English),
3. The product is expected to be Resolution independent.
4. Home page should be structured as a portal to emit core IMD activities.
5. **Dynamic Content Management System (CMS) Features**

User department should have following features for making changes in the website content:

- a. **Dynamic menus:** Menus and submenus should be created based on the page-tree as pages are added and removed. These should be uniformly styled through CSS. If required menu items should have conditional states (i.e., the menu item can be styled Differently if it is the first item, if it is an even-numbered item, or if it is the last item, etc.)
- b. **Multi-language Support:** Content of both languages English, Hindi shall be managed from the same control panel. The concerned Administrator should be able to add content for all the concerned languages from the same page through authentication.
- c. **Audit Trail:** Central administrators should have access to one log in the backend or/and individual logs on each page where he/she can view changes that have been made to the database. Visitor's counters & profile status/logs/IP's etc.
- d. **User Privileges:** An administrator can grant as little or as much control to content editors as needed.
- e. **Metadata Insertion:** should be inserted for each page or globally, and for different languages.
- f. **The developer** must follow a uniform display standard across the pages.
- g. **The developer** should provide a page for site administration with strict multilayered role based access control features. All pages should be digitally signed with digital signature of the concerned role.
- h. **System should** record changes made by a specific user. The CMS Security Model should document changes made to a specific section and should also document details including time, date, user and section of the site modified.
- i. **Spell Check:** Administrator should have the ability to run a spell checker on a content included in online thoughts. It should identify misspelled words and offer suggestions

6. Tenders Notices

- This should help user department in publishing Tender Notices, Tender Documents and related corrigendum on the website.
- This should allow Administrator or authorized staff to Add/Edit/Delete Notices for Tenders
- Tenders should have expiry date and after expiry date it shall move to archives.
- Shall also allow Admin or Authorized staff to add documents to existing Tenders.

7. Archives Management

- a) It should be ensured that the expired contents are automatically moved from the main website to the archive.
- b) There should be an Auto Archival System available on the Website, which shall transfer the expired content in archives section as soon as it shall reach expiry date.

- c) Archived Data should be available for each page along with search option to search data between 2 given dates.

8. News & Announcements

- a) To Publish Latest News & Announcements on the website
- b) Administrator should be able to View/Add/Edit/Delete News/Press Releases and related aspects by adding News Titles and Details through WYSIWYG editor.

9. Site Search

- a) Site search shall allow users to do keyword search in central IMD site.
- b) It shall lead to links of all the pages in which keyword is found on the search result page.
- c) **FULL TEXT SEARCH:** Provision of Full text search in the website for all the content. On entering any keyword, the system must be able to search in all links, sub-links and sub sub-links and should provide links where that word is present. On clicking the link the Content should be displayed.

10. Employment/Vacancy/Recruitment Notices

- a) To publish recruitment notices on the website.
- b) Administrator should be able to View/Add/Edit/Delete notices and related aspects by adding Title and Details through WYSIWYG editor

11. Photo gallery / Media Gallery

An advanced Photo gallery should be developed to allow user department to publish best quality photos in the website. Some of the unique features of Photo gallery should be:

- a) To allow uploading of Image Name, Image, Image Description and Meta tags for each image In consultation with IMD/as per IMD's requirement.
- b) It should have facility to view/add/edit/delete Images in JPEG, GIF, JPEG XR, GIF, PNG, TIF, BMP, SVG and SWF format etc.
- c) It should be accessible across all browser types, and on all different resolutions
- d) **Press Release:** All press releases from IMD should be listed under this section.
- e) **Photo Media /Video Gallery:** Event-wise photographs should be listed under this section. Each Photograph would have a brief description. All photographs would be listed in thumbnail (small) size and on clicking on the photograph it should be opened in a new window with original size.
- f) **Events Calendar:** List along with details of all forthcoming events should be mentioned under this section. When the date of event passes on, it should automatically be moved to archives section under Events.

12. Feedback Management

- a) This shall be interactive and shall help user department in collecting feedback from Website visitors.
- b) The developer should develop an online form for collecting feedback from website visitors.
- c) The feedback can be a general feedback, feedback on content and division/section specific feedback.
- d) All the feedback data should be emailed to the designated officer's email ID, with a copy to central administrator. General feedback should be emailed to central administrator.
- e) A copy of all the feedbacks received should be stored in Website Database on the server for subsequent review by the administrator. The copy of the reply generated by the respective designated Officers should also be emailed to central administrator, along with archival facility in website database.
- f) Create a 'Contact Us' page.

13. Website Statistics

- a) To help respective division in analysing the popularity of the related web pages of the website and visitors behavior, as per actual.
- b) To facilitate the administrator to view website hits, and no. of hits to various pages /products separately.
- c) The administrator should be able to view hits separately for English, Hindi pages of the website.
- d) To facilitate to filter hits based on particular date /time range.
- e) Separate login for administrator to view online members, number of hits in day/ month, search engines, keywords used by engine, repeat and unique visitors, navigation paths, visitor's countries, etc. Authorised users should be logged properly in the system, which should be accessible to central administrator, and can be sorted userswise.

- f) A dashboard should be provided on the homepage for the administrator of IMD (which is mentioned as 'Website Statistics'), should have numerical as well as graphical presentation

14. Search Engine Optimization

This feature should ensure that website is registered in Public Search Engines on appropriate keywords and is displaying the correct information in search description. Following is to ensure appropriate search engine results:

- a) Integrate Page title, Meta description & Meta keywords for all web pages.
- b) Sitemap xml creation
- c) Robot.txt files creation
- d) The website should support automated search engine submission
- e) The developer must provide search features in the new IMD website to top 4 search engines including Google and others.
- f) The developer must create a Site Index to maximize search engine positioning for the website.

15. The developer must provide support for newsletters and latest events of IMD.

16. DESIGN AND BRAND RECOGNITION:

- a) Professional Graphic Design of website should load quickly.
- b) Overall design concept for the website, optimized in terms of identity, accessibility, usability and content distribution. Thus, the following will be taken into consideration when designing and developing the website:
 - Successful bidder will submit at least five design options and will respond to IMD's feedback and refine the design(s) as per IMD requirements.
 - Bidder should use CSS based design approach, Clear and appropriate graphics, W3C compatible coding style while designing the web pages.
 - Colours and images will be chosen according to IMD's requirements.
 - The logo of IMD will be present on the homepage and visible at all times during a Person's visit.
 - There will be areas on the homepage to highlight /flash important events, along with their details. The internal links should allow any user to navigate through the website following the natural progression of the content.
 - The site should include following navigation strategies:
 - Menu system as primary navigation method of the site that is always displayed on each page.
 - Each section must have a main page where visitors can navigate to the sub items under the sections, but should be able to get back on any other main section of the home page.
 - Customized title header, navigation bars & buttons;
 - Intuitive navigation to help inexperienced users to browse the site
 - Clean, clear and concise layout of all pages.
 - Creative flash animated punch lines or banner, wherever required.
 - Search engine friendly design
 - Flexibility to add new specifications at free of cost.

17. Project Plan:

Successful bidder will submit the detailed project plan document of the GIS enabled Website development project which will include technical specifications of website, functional specifications of website, project lifecycle details, workflow, links, navigation, architecture and structure of website, five design options, other services and facilities provided etc.

18. Miscellaneous:

- a) Wherever possible, the developer will move information out of PDF format to HTML or database driven
- b) Management console to control display of information in various sections of site
- c) Contact List of IMD to be HTML format and easily searchable
- d) Announcements, updating of information, profiles, contact information, etc
- e) English and Hindi version, with switch options.
- f) The website developed must be uploaded on the web server after getting approval from IMD.

- g) The website developed must be tested, audited by NIC Certified Auditors and acceptable to IMD with mirrored backup in hot standby mode.
- h) The Website should include the mission, vision, all details of data, data products and services provided by IMD (mentioned in the scope of work above) and organizational set up of IMD and functional map of the organization with sufficient clarity should be displayed on the Website. It should also have comprehensive and complete list of associated, attached and subordinate offices.
- i) The Website should also have the following content structure:
 - (i) Financial reports, results etc.
 - (ii) Budgetary Information.
 - (iii) Publications and recruitment etc.
 - (iv) Interactive Feedback Mechanism
 - (v) Current Events Calendar, Archives, Details of Personnel etc.
- j) **What's new:** This will be a dynamic section and will provide the users with latest reports, announcements and upcoming events. An admin module would enable the administrator upload and change the contents of the section as and when required.
- k) In addition, the website should also have following features:

Type of Work

Description of the Work

Bookmark Page This is a facility to add IMD website into ones list of favorites.

Citizens Charter This is an additional feature to highlight the obligations and Services provided by IMD.

Visitor Count This feature is to count the nos. of hits on the website and no. of hits to various pages /products of the website separately.

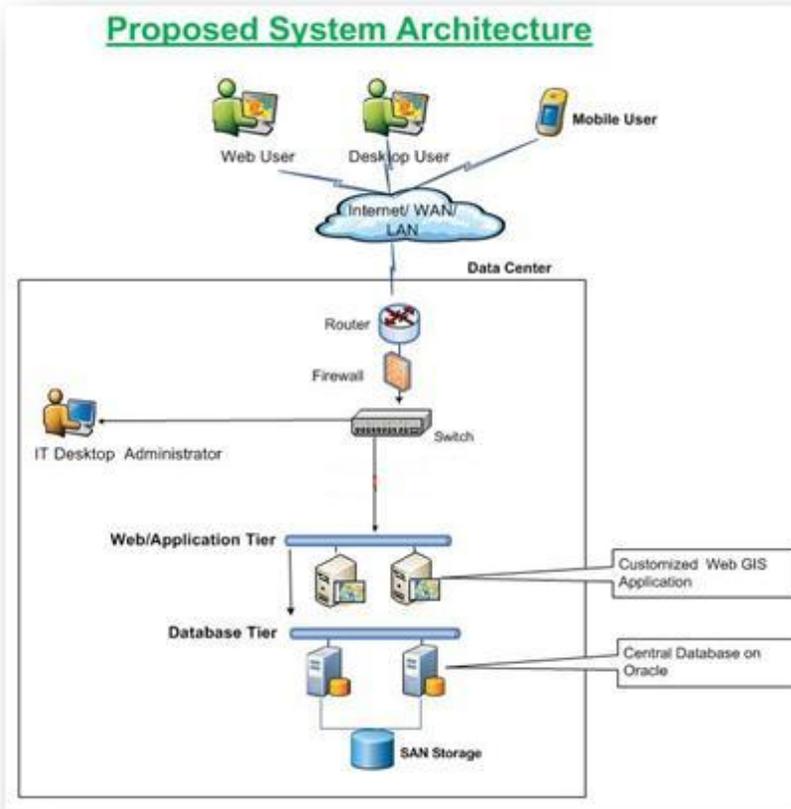
- a) Links to the other websites of related organizations.
- b) The website hit counter needs to be developed initially as per the scope of work with following features. These reports are to be submitted on monthly basis.

- General Summary
- Weekly hits of the website
- Daily hit counts summarized on monthly basis.

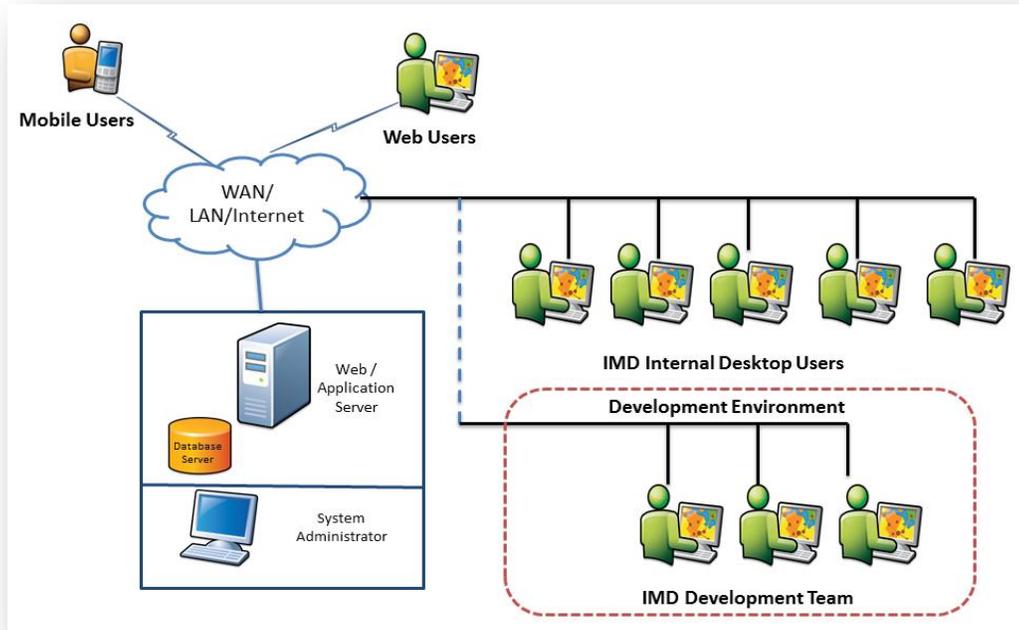
19. Web GIS module

The proposed system, as shown below, will be a web based, end to end system serving IMD users to view, query and generate map based reports with key spatial data layers and links to the relevant attribute information available in the backend database. The solution provided should be that of a robust, reliable, responsive and scalable map services. The GIS server will be configured to handle a number of simultaneous requests and will orchestrate how it responds efficiently to those requests. The software should have compatibility with RDBMS like Oracle. The software should be able to read CAD/Raster/Vector files without any external tool.

Proposed System Architecture



Proposed Application Deployment Scenarios



This module can be divided into following three sections based on the nature of work/functionality-

(1) User authentication

This is to ensure authenticated access to various modules of the customized web GIS application and also to various GIS layers for specific users / user groups.

The user would key in the User Id and password on the login page. The User Id and the password would be validated against the entries in the database. Following action would be performed -

If the credentials provided by the user are correct, then the user would be directed to the application main page. If the credentials provided by the user are incorrect then a message would be displayed to the user that the details provided by him/her are incorrect. The user would only be able to perform actions for which he/she is authorized.

(2) Map Authoring & Spatial Database Tuning – IMD produces every year several maps and graphs that are published in reports, as hard copy as well as electronic products. All these maps and graphs need to be made traceable by providing metadata on all aspects. The data to be projected on the maps needs to be in confirmation with the projection system of the underlying maps. Care has to be taken dealing with the resolution and scaling of the underlying topographic layers and digital images of Satellite and Radars to be superimposed. A centralized spatial database (around 160 expected layers as per Annexure-‘A’) is to be implemented and is to be hosted on GIS Advanced Server to serve the spatial data. IMD have currently two geo-stationary satellite (Kalpana-1 and INSAT-3A) operationally active. Their positions over the equator are at 74 Deg E and 93.5 Deg E respectively. Both satellites have Very High Resolution Radiometer (VHRR) payload, which scans the earth in three spectral (Visible, Infra-red and Water Vapor) bands. The images received in these three spectral bands in Normal, Full frame and Sector scan mode with the time of 23 minute, 33 minute and 7 minute respectively. A new generation INSAT -3D satellite was launched in 3rd quarter of 2013 which carries 6 channel Imager and 19 Channel sounder. The images received from INSAT -3D imager have a provision of Full frame and Sector scan mode with the time of 26 minute, user defined mode respectively. The INSAT-3D sounder provides vertical profiles of temperature and humidity of predefined area on hourly basis. Data of all the spectral bands are multiplexed in a single file as HDF-5 format for each satellite passes. HDF-5 (Hierarchical Data Format -5) file contains all the calibration, navigation data along with the radiances of all the spectral bands. IMD is keeping the same format for the satellite derived products, like Outgoing Long Wave Radiation (OLR), Quantitative Precipitation Estimate (QPE), Sea Surface Temperature (SST), Upper Tropospheric Humidity (UTH), Atmospheric Motion Vectors (AMVs), Normalized Vegetation Index (NDVI), Aerosol Optical Depth (AOD) and many other products. Satellite images (INSAT 3A&3D/KALPANA-1/NOAA) and some other scanned maps are to be published as OGC services to serve the base maps. For fast rendering over web it is essential to author the maps properly. So, under this section following works have to be done-

(A) The developers have to provide a facility to integrate this data over ArcGIS platform with proper navigation accuracy. This GIS based web-site design should have a provision to display all the images /products generated by INSAT/NOAA/Metop/MODIS/Oceansat-II/Megha-Tropique/INSAT-3D by using suitable visualization, geo-referencing and re-sampling tools along with proper thumbnails. Web site should have a provision to add new set of products whenever operationalised by the Satellite Division.

(B) The web site should have the provision of zooming, contouring, enhancements, filtering, smoothing, multi-satellite composite and capturing the desired area etc along with the desired attributes and navigation accuracy of various satellite images /derived products.

(C) The web site should have the capabilities of buffering, distance area measurement along with map algebra of Boolean, polygon operations etc.

(D) Making good looking maps by applying optimized symbology, designing legends, generalization and making layers scale dependent. This work has to be done with close co-ordination with IMD team.

(E) Defining dynamic vs tiled cached map services, policies and space requirement assessment of tiled cached map service for raster maps.

(F) Spatial Database

(G) Agromet Advisory

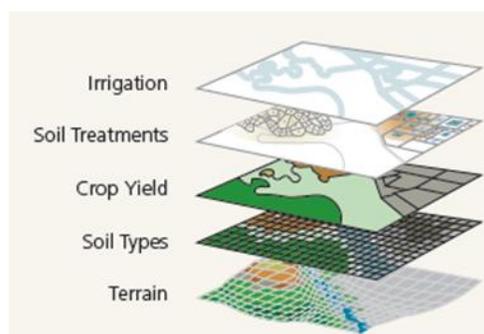
The GIS based database of IMDs observation system will be broadcasted in the form of maps of soil type, soil moisture, soil temperature, air temperature, humidity, rainfall, wind, cloud, bright hours of sunshine and crop condition, pest and diseases infestation status, drought and aridity, maps showing monsoon activity, cyclone tracks superimposed on satellite imageries, areas likely to be inundated due to approaching cyclones, floods due to heavy rains during monsoon, Isohytal maps for all the river basins of India as well as tables which will be easy to visualize, share, analyse various real time meteorological data parameters and Agromet products.

This section will consist of different pages for issuing agromet advisories to different users. The agromet forecast and warnings will be uploaded periodically in some directory structure. The agromet module has ability to receive data in two formats:

- Automatic/ dynamic upload on daily, weekly, bi-weekly basis.
- Manual Upload

In case of automatic upload, the data (warnings, advisories) would be uploaded in folders for each district and states and same would be shown in user interface (UI) design. The click of link will fetch the required files from the fileserver. The agromet forecast is generated by IMD at the district level for the whole State. The agromet advisory units of IMD at state level and agromet field units at agroclimatic zones will be using the same for generation of agromet advisories and its dissemination to farmers.

A map of an agricultural area, one layer might represent the boundaries of a piece of land; a second layer, soil types; another, the crop yield or a specific soil treatment; and still another, irrigation. It will, for example, can show how the relationship between the soil type, fertilizer and water affect crop yield on a given square acre of land. A map depicting how soil variability influences crop yield suggests precise soil management solutions.



Agromet Division, Pune

Hyper link buttons to be provided for the following features:

- District wise Value added forecast
- Block level forecast
- Agromet Bulletins
- National Agromet Advisory Services(AAS) bulletin
- State AAS bulletin
- District AAS bulletin
- Block AAS bulletin
- Weekly Weather AAS summary
- Monthly AAS bulletin
- AAS bulletin based on Extended Range Forecast
- Special agromet advisories given during extreme weather events (cyclone, heat/cold wave, heavy rainfall etc.)
- Alerts and warnings
- SMS agromet advisories

Dissemination of Agromet Advisory

- Agromet Data
- Agro AWS data
- Data from conventional agromet observatories
- Agromet products
- Contours (Actual and anomaly for Max. temperature, Min. temperature, cloud, Relative Humidity, wind speed)
- State-wise Rainfall Maps (weekly and seasonal)
- NDVI Maps
- SPI Maps (weekly, fortnightly , seasonal)
- Maps of soil type, soil moisture, soil temperature, air temperature, humidity, rainfall, wind, cloud, bright hours of sunshine and crop condition, pest and diseases infestation status, drought and aridity.
- maps showing monsoon activity, cyclone tracks superimposed on satellite imageries, areas likely to be inundated due to approaching cyclones, floods due to heavy rains during monsoon, Isohytal maps for all the river basins of India as well as tables which will be easy to visualize, share, analyse various real time meteorological data parameters and Agromet products.
- Reports
- Various events conducted in Agrimet Division (training, workshop, meetings etc.), publications (proceedings, reports etc.) on home page
- Farmers Awareness Programmes
- Kissan Melas
- Field visits
- Research and Development
- Photo gallery

(H) Seismology

The Seismology / Microzonation related products to be hosted on the website shall be of two types, viz., dynamic and Static. The Dynamic page shall provide the preliminary hypo central parameter listing of significant earthquakes occurring in and around the country with the latest event displayed on the top of the page. The page will have provision to search for events occurring during the past month, year, etc. for a period of, say last 5-15 years. The dynamic product page shall also have links to some additional information derived through database search and analysis. These links are required to be designed and developed as part of the development of the Website.

The Static content of the web page shall contain information / figures / tables, relating to the following:

- Seismological activities of IMD–A brief overview.
- Earthquake terminology.
- Modified Mercalli Intensity Scale.
- Seismicity map of India.
- Map of National Seismological Network.
- Map of V-SAT based seismic telemetry network around Delhi.
- List of Seismological Stations.
- Seismic Zoning Map of India.
- List of significant earthquakes in India.
- Details of some significant earthquakes (damage, tectonics, etc.)
- Seismic Microzonation related products.
- Frequently Asked Questions (FAQs).

For the updation of the Dynamic products, the authorized person and/or Duty Officer, available at Central Receiving Station (CRS), IMD, and New Delhi on a 24X7 basis, be provided the access to update information under Content Management System. For the updation of the Static products, which is not done frequently, it is suggested that a senior officer authorized by Divisional head may be provided access to update information under Content Management System.

The mechanism for upload the data (Dynamic products only) on Website should be provided a direct link to the Web servers, so that immediately on occurrence of an earthquake the information is updated by him, as per the practice being followed presently. Already a small routine is now in use for transmitting the earthquake information in a prescribed format to IMD's web server.

The images would be provided in Seismology folder as per data structure. The list of earthquakes should be stored in database.

The following GIS features are proposed to be incorporated for the Seismology division of IMD:-

(A)

- (i) Generated digital GIS ready maps for different layers such as, political boundary map (approved by Survey of India) upto district level, Physical map, seismic zoning map, tectonic/geological map and seismic network map for plotting earthquake event(s) on various combinations of maps at a time or separately.
- (ii) Display the source parameter on the various maps with provision for zoom/un-zoom of the map.
- (iii) Should generate maps of expected intensity contours and likely impact/effects (as per Modified Mercalli Intensity scale), using standard empirical relations. (Information on attenuation relations etc. shall be provided by IMD).
- (iv) Using the above maps, information in tabular form shall be generated, giving the distances of about 8-10 nearby important cities/town in and around the epicenter of the earthquake and associated likely impact/effects expected in these cities/towns along with intensity.

(B)

The following GIS features are also proposed to be incorporated for the presentation of city specific microzonation products:-

Generated digital GIS ready city specific political boundary map (approved by Survey of India) on different available scales (1:10000, 1:25000, 1:50000 scale), for presentation of different microzonation products layers such as Seismo tectonic, geological/Geomorphological, Peak Ground Acceleration, Amplification factors, Spectral acceleration, Liquefaction susceptibility etc

(I) Hydrology

The following features are proposed to incorporate for the Hydrology division of IMD:-

- i. Excel based Reports for the Met. Subdivisions, States, Districts, talukas (Tehsils) and for the various river basins and sub-basins or any pre-defined boundary at specified temporal scales (daily, weekly, seasonally cumulative, monthly, seasonal and annual, in tabular form will be uploaded from Hydrology at HQ and data should be displayed on the Web in tabular form as well as to be plotted on GIS based maps.
- ii. Sub-divisional real-time rainfall maps (on daily basis during monsoon season and on weekly basis throughout the year) for the week and seasonal cumulative till date, uploaded from HS at HQ will be displayed on the Web.
- iii. Sub-divisional Updated rainfall maps on monthly, seasonal and annual basis will be uploaded from HS at HQ to be displayed on the web.
- iv. A sub-division wise bar graph depicting daily rainfall and the normal rainfall (line in different color in the same graph) should be prepared on daily basis during monsoon season and on weekly basis for each of the season throughout the year using the data supplied in para (ii) above and be displayed on the web.
- v. A comparative rainfall statement, week by week rainfall tables, district-wise and subdivision wise rainfall departure block charts as they are presently being displayed on IMD website will be uploaded on Weekly basis and should be displayed.
- vi. Other static rainfall products from the division presently displayed on IMD website like district-wise rainfall for last five years (text files from the division will be supplied annually), Sub-divisional Normal Rainfall in form of Maps and Tables (to be updated whenever changed, may be once in 5 years or so.) also need to be displayed.
- vii. River basin-wise Quantitative Precipitation forecasts generated using IMD's WRF and MME forecasts are to be displayed on the website on daily basis.
- viii. Plotting of real time cumulative rainfall data of short duration (1hr, 3hr, 6hr, 9hr, 12hr, 15hr, 18hr, 21hr, 24hr) from AWS/ARG on basin map of the country starting from 0830 hrs IST. Each duration rainfall data shall be plotted on separate map. There shall be provision to the user to select the date of rainfall for current day and past two days.
- ix. Subdivision-wise, State-wise and District-wise SPI maps on monthly, seasonal and annual basis shall be prepared and uploaded by Hydromet Division for web display or else tabular SPI data will be uploaded that should be depicted on GIS based maps.

- x. Subdivision-wise Rainfall Distribution and Monsoon Activity is to be plotted on map of India. Data in text form will be uploaded from Hydromet at HQ.
- xi. Reports will be additionally displayed in their Hindi version also.
- xii. A Brief introduction of Hydrometeorology and list of papers/documents related to the division are to be displayed as static pages, may be updated as and when required. It is also proposed to add new stations in the future.
- xiii. The rainfall graphs would be plotted dynamically at each day and stored in file server. The same would be uploaded on to website. The data for the graphs would be supplied by GTS files.

(j) Numerical Weather Prediction (NWP)

The following features are proposed to incorporate for the Numerical Weather Prediction (NWP) and Nowcast (NWP) divisions of IMD, respectively:

- (a) The standardization in terms of the Projection and coordinate system needs to be maintained while constructing the maps from IMD data .As per the International norms the data needs to be in WGS84 projections.
The above products along with the time based animation to be able to publish through WMS services
- (b) Nowcast division of IMD is mandated to take meteorological observations on real time basis and to provide current & past observations for operational and research use. Surface Observatories are located almost one in each district (559 observatories) so as to meet the requirements of agricultural, transport and other operations. Under the ongoing modernization program of IMD, a network of 1000 Automatic Weather Station (AWS) and 3600 Automatic Rain Gauge Stations (ARG) has been established across the county in a phased manner. IMD is receiving and processing meteorological data from two Indian satellites namely Kalpana-1 and INSAT-3A. At present about 48 nos. of satellite images are taken daily from Kalpana-1 which is the main operational satellite and 9 images are taken from INSAT-3A. All the received data from the satellite is processed and archived in National Satellite Data Centre.

(K) Cyclone:

The cyclone related products to be hosted on the website shall be of two types, viz., dynamic and Static. The static page shall provide information about RSMC New Delhi, Cyclone Warning Division, various publications, awareness about cyclones and archival. The dynamic page shall contain information regarding Warnings/Advisories, Cyclone Warning Graphics, Marine forecast / warnings, Diagnosis / Prognosis, NWP Model Products, Satellite and Radar Products etc. All the graphical products should be GIS based. The information may be provided as below:

Static Pages to be prepared for the following:

RSMC

- Historical Perspective
- Activities
- Organization Structure
- Bulletins & Products
- Contact

CWD

- Mission & Vision
- Activities
- Cyclone Warning Organisation
- Bulletins & Products
- Contact

Cyclone Awareness

- Do's and Don't
- FAQs
- Terminology
- Warning Graphics Legend
- TC Names
- Four Stage Warning
- Damage Potential of Cyclones
- Port Warning & Signals
- Acronyms
- Bulletin

Publications

- Preliminary Report
 - 2012
 - 2011
 - 2010
- Annual RSMC Report
- TCP-21
- Annual Cyclone Review
- Met. Monograph
 - Ogni
 - Gonu
- FDP Report
 - FDP Implementation Plan
 - FDP Implementation Report-2012
 - FDP Science Plan

Tools and Data

- Observation
- Satellite Products
- Radar Products
- NWP Products

Forecast Verification

- Track Forecast
- Intensity Forecast
- Landfall Forecast

Archive

- Cyclone E-Atlas
- Best Track
- Bulletins
 - 2013
 - 2012
 - 2011
 - 2010

Climatology

- Genesis
- Intensification
- Movement
- Dissipation
- Frequency of Cyclone
- Unique Tracks

Contact

- Focal Points
 - Panel Members
 - ACWCs & CWCs
- Contact Us

Dynamic Pages:

Cyclone Warnings/Advisory

- Bulletin For Indian Coast
- RSMC Bulletin
- Quadrant Wind Forecast
- GMDSS bulletin
- TCAC Bulletin

Cyclone Warning Graphics

- Observed & Forecast Track
- Severe Weather Warning
- Storm Surge and coastal inundation Model Guidance
- Quadrant Wind Warning
- TCAC Graphics

NWP Guidance

- GPP
- QLM
- HWRF
- MME

- EPS

Marine Forecast/Warnings

- Ocean State Forecast (wind and wave)
- Sea Area Bulletin
- Coastal Weather Bulletin
- Port Warning
- Fisherman Warning
- GMDSS Bulletin

Objectives of the Division

- (i) GIS based display of city based Nowcast and Local Forecast
- (ii) Display of AWS and ARG data
- (iii) GIS based display of WDSS-II Nowcast output in animation form.
- (iv) GIS based display of ARPS, WRF and GFS model output in animation form
- (v) Cyclone track forecast (single model and multi-model ensemble tracks) display.

(L) Environment Monitoring and Research Center (EMRC) and Polar Meteorology and Research Division (PMRD).

The website shall include the following:

- (i) A web page related to "Environmental Monitoring" which include information on Ozone, Aerosols etc.
- (ii) A link for "Air Quality of Delhi" and for other cities in future.
- (iii) A web page for "Polar Meteorology" which includes the Antarctic Meteorological Current data and forecast, Polar WRF analysis and forecast charts and other information related to IMD's participation in scientific expeditions to Antarctica.

Implementation Plan

1) **i) Background :** India (political boundaries)and adjoining countries and Indian Ocean (Survey of India/ Bhuvan Map)

ii) Overlay Products:

- a) State boundaries
- b) Nowcast of cities (640 cities) for all District Head Quarters in India
- c) Local Forecast (640 cities)(24 and 48 hour forecast) and observations of Maximum and Minimum Temp
- d) Satellite Imagery (IR1, IR2, MIR, WV, VIS, SWIR)
- e) Highways
- f) River Catchments
- g) Hourly AWS All India Temperature, Rainfall, pressure, Wind Speed & direction Contours
- h) Hourly AWS All India Rainfall Profile
- i) Spatial data of all India Nowcast as well as regional nowcast models.
- j) Spatial data of all India forecast output from ARPS, WRF and GFS models.
- k) Track forecasts from different models during cyclone period

(2) Service / Map API Development: To use the data (spatial / non-spatial) by other IT systems it is essential to serve the data, data products and information as service. As mentioned in above section around 160 different layers of spatial data is planned to be maintained and updated in centralized spatial data repository. So, to serve the spatial data it has to be published as service. However, the data is to be published as OGC compliant secured WMS services but to simplifying the implementation, maintenance, development, it is felt that it should be exposed through customized Javascript based Maps API wrapper. The wrapper can be developed on GIS Javascript API or OpenLayers. So, under this section following activities are proposed to be done:

(a) Development of JavaScript Maps API so that other application developers can embed maps in their application. The availability of layers to particular client will be based on their credentials.

(b) Complete user administration sub-module have to be developed for user registration to use the MAP API, authorization, de-authorization and other common user admin facilities. The authorization of the map API will be based on the layers and domain name of the client. So that administrator can authorize the client to use specific layers.

(c) Development of XML / REST based services: It is planned to serve some of the data as XML or JSON which is based on spatial / non-spatial queries. For example based on the latitude, longitude and elevation, other client application should able to identify the nearest village or town or get list of shelters/schools with-in distance of 1 km.

(3) Web GIS Application: The application module will work as a typical web GIS application through which user can perform following GIS functionality through the web browser:

(a) Basic Mapping System: The application should have following basic mapping functionalities-

- i) Zoom In, Zoom Out, Panning, Full Extent, Previous Extent, clear selection.
- ii) Go To Location
- iii) Layer and Legend Management
 - b. This is to allow to the users to view the Layers and Legend of the map and perform the following action on the layers:
 - c. Set Active layer
 - d. Setting the visibility of Layers On / Off
 - e. The legend would show the Symbology used for the layers
 - f. Identify Tool
 - g. Length, elevation & Area Calculation
 - h. Print Map (Scale based)
 - i. Set to Scale

(b) Adding Online Maps /OGC Services: The application should have facility to add OGC Compliant WMS & WFS Services as well as online base maps like Survey of India/ISRO's Bhuvan maps, IRS satellite maps. Support to add Google, Open Street, Bing etc. as a base map layer in the future, if required, to be available.

(c) Identify and Search: This module would provide user the attribute information of the point of interest. The user would be able to first select the attributes/parameters that are to be displayed in the pop up. After the user has selected attributes, their corresponding values are displayed in the form of pop up. A search facility would be available in application so that user can search meteorological related phenomena, location, assets based on the keywords.

(d) Users Feedback: The application should have facility to give feedback on any feature or location and it should be available for other users if they want to see it.

(e) Data Validation: The spatial feature created /edited /uploaded through fixed electronic / mobile devices will be validated by the authenticated user. User should be able to Accept /Reject the changes made and a log should be created for the same. Develop a Quality Check module to ascertain the quality of the input data, the module will ascertain the data values in the input data, any deviations in the input data from expected values for that particular period and region will be reported to the administrator and Administrative module for handling above errors and reporting.

(f) Attribute Query: The application should have facility to query the map based on the attribute available with digital map as well as from the linked table available in separate database. For example user want to query all the meteorological related phenomena started between 1-Apr-2012 and 30-Jun-2012 then system should display the result in a grid as well as it should be displayed /highlighted on the map. Customization of Map based Query functions and viewing of maps.

- (g) **Spatial Query:** The application should have facility to run query on multiple layers with spatial operators. For example, using real-time weather feeds within a GIS system to track storms/ Adverse Weather Events, IMD can alert concerned public *before* a potential event and advise them to take steps to minimize damage or if a user wants to list out & select all the villages to be effected by the storms/Adverse Weather Events.
- (h) **Attribute + Spatial Query:** The application should have facility to run combination of attribute & spatial query. For example, if a user wants to select all the crops to be effected by excessive rains inside an administrative unit or area drawn on the map and the current status of the crops is surviving/Not surviving. Here, crops and Administrative unit are digital map layers while surviving /not surviving crops is an attribute of crops layer. The application should support spatial analysis including spatial queries, thematic maps, buffer zones etc.
- (i) **Export Data:** The queried data can be exported as PDF/ XLS/ SHP/KML file format and also GIS map/ TIFF/GIF/JPEG/PNG & SVG etc.
- (j) **Virtual Tour of all meteorological related phenomena / specific patterns:** The application should have facility to visit virtually on a selected meteorological related phenomenon using Government approved maps. In this functionality user will select a particular meteorological related phenomenon or a pattern and Fly from Location (any city or point selected from the map), then system to start tour from Fly from Location and finish to the meteorological related phenomena / specific patterns. It is similar to Google Tour and can be developed using suitable API.
- (k) **Spatial Analysis:** The application should have basic spatial analysis functionality like Buffer and Density. For example user want to select/highlight all the habitation/villages within 5 Km to be effected from the cloud burst in a particular Block or identify the fire prone areas based on the fire incidents. Here, cloud burst Center is a Point Layer and habitation is a polygon layer.
- (l) **Compatibility:** Vendor has to ensure the compatibility between Survey of India Maps and Bhuvan Maps and their interoperability wherever required.
- (m) **Location Profile Creation:** System should create profile of the location based on the area drawn on the map or selection of meteorological related phenomena /specific patterns /location using available attribute & spatial data. For example user has created a point on the map as a proposed cloud burst location, then system should generate profile of proposed meteorological related phenomena / specific patterns in A4 size page having following non-meteorological layers as well as meteorological data layers:

Administrative Details – State, District, Block, Natural Resources - Example: Forest, Water bodies, etc

- Demographic Datasets (Example: Population, etc)
- Socio-economic Datasets

Example: Streets, Hospitals (in case of major only), shelters, Schools (in case of major only),

Meteorological data layers to be used:

- Surface winds, speed and direction, temperature, sea surface temperature, atmospheric pressure, visibility, humidity, rainfall
 - Surface temperature
 - Rainfall
 - IMD warning
 - Automatic Weather Radar Network data
 - Dynamic Imagery provided by INSAT satellite/NOAA
 - Dynamic Imagery provided by INSAT satellite/NOAA/Metop/MODIS/Oceans at-2/Megha-Tropique /INSAT-3D with a facility to overlay synoptic
- /AWS/RADAR data on these satellite images.
 - Radar data in netcdf format
 - Model data (netcdf/Grib format)

- (n) **Thematic Map Creation:** System should generate various thematic maps based on the attribute information available in databases. For example, by overlaying a projected cyclone path onto multiple map layers showing roads, streets, schools, hospitals, and fire stations, which is to be stored in a separate database and if the user wants to create various thematic maps based on the problems faced in the past, then system should extract relevant data from separate database and show the areas to be affected by cyclone in red color and green color for areas not being affected. The color combination of the theme should not be fixed and should be customizable by the user. Besides, the user can more easily and accurately make decisions such as when and where to deploy emergency teams, which road/street to blockade, which street to assign for evacuation routes, which schools and neighborhoods to evacuate, which hospitals to assign potential casualties. Because he has detailed attributes of the cyclone's intensity, speed and direction, he can better assess the potential damages and casualties that might occur.
- (o) **Navigation between Locations** - The application should have facility to navigate or perform network analysis between any two locations selected by the users. In this functionality user will select a particular location (any city or point selected from the map) then system to should the route from and to the location, when supported by the network data.
- (p) **Visualization of Time stamped Layers** - The application should support to view features / events based on the defined time. IMD will provide details of the layers / feature classes that need to be time stamped at the time of the Requirement Analysis.
- (q) **Visualization of Temporal Change on Ground / meteorological related phenomena:** System should facilitate to visualize temporal change based on the satellite images with proper navigation accuracy served as WMS-T services, suitable API for particular meteorological related phenomena for selected and available images. Also, various photographs related to site should be shown on information window.
- (r) **Integration of local spatial / non-spatial data:** System should have facility to add spatial or non-spatial data from users' local computer and visualize on the map. If the data is nature of spatial then it should be overlay on other available layers.
- (s) **Integration with MIS Data:** The administrative unit maps (District/Block etc) should be highlighted or graphs should be generated based on the MIS data available for respective admin unit. (Details can be discussed during requirement gathering).
- (t) The vendor should ensure that the website so developed should comply to the web / internet /network policy of IMD/NIC and clear the website audit before hosting of the website in IMD Server. Further, the website so developed should also comply with the relevant security policy of CERT-IN, Deptt. of IT, Govt. of India. The Security audit after commissioning of the website and during warranty period on annual basis by certified and approved auditors by NIC/ CERT-In shall be the responsibility of the vendor.

The Website application should have the following features:

19. Back Integration Services:

- ✓ **SMS and Email-integration:** The website will provide integration with SMS and email servers for real time messages. It should be possible to send / receive alert SMS and emails to administrator / authenticated user regarding any changes / modifications done in the web site.
- ✓ **Database Integration:** The website will provide a connection to our back end data bases and front end websites.

20. Search Engine Optimization:

- ✓ **Meta-Tags, Keywords & Page Titles:** ensure that each web page has the appropriate page title, keywords, or any other meta tags that are required.

21. Copyright and Trademarks

Successful bidder will hand over all the software and graphics to IMD for the purpose of copyright and intellectual ownership. On the bottom of every page information regarding copyright should be displayed.

22. Onetime onsite training

Bidder will provide training on operation, maintenance (Hardware and software) and administration of the designed website (including entire system) at IMD premises to IMD officials.

The bidder shall provide one time onsite full-time training of up to 10 working days to IMD officials to train them on the overall workflow of the developed solution and backend administration functions at New Delhi to understand technical, administration, development, operation, maintenance aspects of the work. The schedule & syllabi shall be finalized in mutual consultation with IMD. Necessary training material and documents will be provided well in advance in print (four hard bound copies) as well as in electronic form (four copies on DVD) by the bidder as per finalized syllabus. The bidder shall bring out this training cost separately in the commercial offer (if any). The training should also cover software training on the tools/ technology used in details. Training on backup and restoration procedure for the entire system and subsystem must be imparted to make the system live (operational) in case of any malfunctioning/ corruption of software etc and the entire procedure should be documented in the training material. At least of one set of such backup should be provided to IMD and restoration of the system must be demonstrated using those media. It will be an essential part of SAT.

Above mentioned dynamic, CMS, GIS based central IMD website shall be developed in English and in Hindi. Contents of the website in Hindi will be in Unicode format and similar to that of the Central IMD Website in English.

Chapter 4

TECHNICAL SPECIFICATIONS

4.1 Intent of Specifications:

It is intended to design entirely new centrally maintained, Content Managed, dynamic GIS enabled IMD website with advanced contemporary technical features capable of speedy and effective dissemination of weather related information in collaboration with associated organizations and for timely delivery of citizen centric services nationally and internationally. The dynamic GIS enabled website is to be given complete new look & feel technically and aesthetically with automated content management system support and other advanced communication features.

4.2 Hosting Environment

The present website is hosted at IMD on Linux based server with appropriate backend database support. The proposed website to be developed by the bidder must be compatible to the given technical environment. The bidder may seek the permissible details on existing ICT environment. The bidder is expected to follow present stable and standard development environment in consultation with IMD and will disburse with involved technical details of development environment at IMD.

Following are the suggestive specifications for software and hardware items required for the proposed IMD website. However, vendor may suggest additional items required, if any (with full justifications), to meet the requirements mentioned under the scope of work.

4.2.1 Software:

4.2.1.1 Technical Specification of ArcGIS software of latest version and release for Desktop (License – 2 nos.)

A. General GIS Features:

Sl. No	Specifications
I. Vector and Other Data Support	
1.	Personal Geodatabase for Microsoft® Access, File Geodatabase, Personal, Workgroup, and Enterprise Geodatabases, Shapefiles, SQLite Database using Spatialite Geometry Types, ArcInfo Coverage file, Smart Data Compression (SDC) Data, Vector Product Format (VPF) Data,
2.	Open Geospatial Consortium, Inc. (OGC), Web Coverage Service (WCS), Open Geospatial Consortium, Inc., Web Map Service (WMS), Network Common Data Form (NetCDF),
3.	Geodatabase Terrains, Microsoft Excel Worksheets, , dBASE (DBF), Text (TXT, CSV), Query Layers Defined in a DBMS with SQL, Database Connections, Microsoft Access
4.	Read & Write Personal Geodatabase, File Geodatabase, Shapefiles, SQL Express and Enterprise Geodatabases,
II. CAD Data Support	
5.	DWG, DXF, DGN, Mapping Specification for CAD—Import/ Export from CAD
6.	Graphically Align CAD Data with Other GIS Data and Store the Transformation Definition (Georeferencing)
III. Raster Data Support	
7.	Bathymetric Attributed Grid (BAG), Big TIFF, Bitmap, DIB, BSB Nautical Charts, CIB, DIGEST, UTM/Universal Polar Stereographic (UPS) Standard Raster Product (USRP), DIMAP, DTED Levels 0, 1, and 2, ELAS, ECRG, ECW, Envisat Image Product (ESAT), ENVI Header Format, ERDAS 7.5 GIS, 7.5 LAN, and RAW, NDF, Floating Point Raster (FLT), GDAL, VRT, GXF, GRIB, Golden Software Formats (GSAG, GSBG, GS7GB), Hierarchical Data Format (HDF)–4, HDF5, Heightfield Raster (HF2), HGT, HRE, RST, ILWIS Raster Map, IDA, Intergraph Raster Files: CIT™ Binary Data; COT™ Grayscale Data, Integrated Software for Imagers and Spectrometers (ISIS), LAS, Magellan MapSend (BLX/XLB), Match-AT, MrSID Generations 2, 3, and 4, NITF, NLAPS, New Labeled USGS DOQ (DOQ2), Oracle Spatial GeoRaster7, PCI .aux Labeled Raw Format (PAux), PCI Geomatics PCIDSK (PIX), PDS, PNG, PCRaster (MAP), RPF, SAGA GIS Binary Grid, Sandia Synthetic Aperture (GFF), SDTS, TIFF, TER/TERRAIN, United States Geological Survey (USGS) ASCII Digital Elevation Model8, United States Geological Survey (USGS) Digital Ortho Quadrangles (DOQ), XPixMap (XPM)8
8.	EOSAT FAST (FST), AIRSAR Polarimetric, Applanix DSS, FORMOSAT-2, GeoEye Satellite, IKONOS Satellite, Japanese Aerospace Exploration Agency (1.1 GUD, 1.5 GUD), KOMPSAT-2, Landsat Satellites (1–7), NOAA .gtx Vertical Datum Shift, NOAA Polar Orbiter Level 1b Dataset (AVHRR), OrbView-3 Satellite, RADARSAT-2, QuickBird Satellite, RapidEye Satellite, Raster Catalog, SRTM, TerraSAR-X, SPOT Satellites, Worldview Satellites
9.	Read & Write ERDAS IMAGINE, Grid, Grid Stack, and Grid Stack File, Geodatabase Raster, GIF, JFIF, JPEG, JP2, PNG, GeoTIFF, Oracle Spatial GeoRaster
IV. Geodatabase Raster Management	
10.	Create and Edit Raster Attribute Tables for All Supported Single Band Raster Formats
11.	Compress Geodatabase Rasters with LZ77, JPEG, or JPEG 2000 Compression Algorithms
12.	Create and Manage Raster Data in a Multiuser Geodatabase
V. Spatial Referencing	
13.	Vector and raster georeferencing, Georeferencing using Raster-raster, Raster-Vector, Vector-Raster, Vector-Vector and vice versa
VI. Coordinate System	
14.	Predefined Geographic Coordinate Systems, Projected Coordinate Systems and Vertical Coordinate Systems, Ability to Create and Use Custom Coordinate Systems
VII. Graph	
15.	There should be tools to Create and save 2D or 3D Graphs like Horizontal and Vertical Bar, Line, and Area, Histogram Bar, Scatterplot, Scatterplot Matrix, Box Plot, Bubble, Polar, Pie.
VIII. Symbology	
16.	User-Imported Picture Symbols (PNG, JPG, JPEG, GIF)
17.	Modify the Geometric Effects of a Symbol: Line Width, Hatch Size
IX. Advanced Cartography	
18.	Store Multiple Representations of GIS Features in a Geodatabase for Use in a Variety of Map Products
19.	Create Rules That Dynamically Manipulate the Geometry and Symbology of a Feature (Representation Rules), Share Representation Rules through Style Files
X. Raster Data Display	

	20.	Display Raster Products from Image Sensor Raw and Metadata
	21.	On-the-Fly Orthorectification, On-the-Fly Panchromatic Sharpening, On-the-Fly Hillshade Effect for Elevation Data,
	22.	Software should have facility to Create Video from Time Series, Layer Transition, or Map Navigation Animation
	23.	Time Animation and Temporal Data: Create Time Series, Layer Transition, or Map Navigation Animation, Animate Data Change with Tabular (Charts), Vector, Raster Catalog, and NetCDF Data, Export Animations as Sequential Images, Create Video from Sequential Images, View Temporal Data with the Time Slider, View Live Temporal Data in Real Time
XI. Presentation and Data Sharing		
	24.	It should have facility to configure dynamic legend, so that legends support the display of only features in the current visible extent and features counts.
	25.	It should have the facility to export the layout map to industry standard formats like EMF, BMP, EPS, TIFF, JPEG, PNG, GIF, SVG, AI, and password-protected PDF files for easy sharing with the non GIS software users.
	26.	Software should have the facility to generate report and have ability display it on map layout
XII. Spatial data creation and management		
	27.	Point and Click On-Screen Digitizing, Use Stream Digitizing, Auto Complete Construction (Polygon Border, Freehand Curve), Create Freehand Bézier Splines, Create a Curved Line at the Intersection of Two Existing Lines (Fillet)
	28.	Add a Coordinate Based on an Angle from One Location and a Distance from Another, Add a Coordinate Based on the Implied Intersection of Two Segments, Add a Coordinate in Decimal Degree (DD, DMS, DDM) Format, Add a Coordinate Based on a Distance from Two Known Locations, Add a Coordinate at the Midpoint between Two Known Locations, Add Coordinates along Existing Coordinates
	29.	Construct a Bézier Curve, Construct a True Circular Curve, Construct a Tangent Curve, Construct Rectangles and Circles,
	30.	Simultaneously Edit Multiple Layers, Perform Unlimited Undo/Redo Operations
	31.	Software should have inbuilt tools to Display Real-Time Location Points from a GPS Receiver, Dynamically Center the Map on the Current GPS Point and Store GPS points in a Log File
	32.	Software should support simple Network analysis like Trace Upstream, Trace Downstream
	33.	Software should support administer and editing of spatial data in the industry standard RDBMS like Oracle, IBM DB2, MS SQL, PostgreSQL using Operating System or Database Authentication
	34.	The software also should support simultaneous editing by multiple users and long transactions capabilities with advanced rule-based editing in industry standard RDBMS
	35.	Software should support Distributed Geodatabases with connected or disconnected editing
	36.	The software should have the capability to Generate Metadata Automatically or Manually for all GIS data and should be able to Import/Export metadata
	37.	The software should support metadata creation in industry standard formats like INSPIRE, ISO 19139, ISO 19139 2003, FGDC
XIII. Raster Editing and Vectorization		
	38.	Vectorize 1-Bit Raster Data
	39.	Vectorize 8-Bit Raster Data (with Bilevel Classification Applied)
	40.	Raster Snapping: Centerline, Corner, Intersection, Ends, Solid
	41.	Interactively Trace Raster Lines, Ignore Holes in Raster Linear Features during tracing
	42.	Vectorize Entire Raster, Vectorize Specific Raster Area, Simultaneously Capture Line and Polygon Vectors
	43.	Cleanup: Undo/Redo Raster Cleanup Operations, Erase or Fill Selected Cells, Save Selected Cells to New Raster
XIV. Topology		
	44.	Display a Summary of the Errors and Exceptions in the Topology
	45.	Display Errors, Exceptions, and Dirty Areas in the Map
	46.	Construct and Edit Topologies Created from Layers in the Map, Move Topological Edges and Nodes
	47.	Modify the Coordinates of Shared Edges or Nodes
	48.	Add or Remove Individual Feature Classes in a Topology
	49.	Add or Remove a Rule in a Topology

XV. GeoProcessing	
50.	Data Compare: Feature Compare, File Compare, Raster Compare, Table Compare, TIN Compare
51.	Create Cartographic Partitions, Delineate Built-up Areas, Aggregate Polygons, Aggregate Points,
52.	Raster management: Build Pyramids and Statistics, Build Raster Attribute Table, Clip, Composite Bands, Create Ortho Corrected Raster Dataset, Create Pan-Sharpended Raster Dataset, Get Cell Value, Mosaic (with Optional Color Balancing), Resample
53.	Conversion: Excel to Table, Feature Class to Feature Class, Import CAD Annotation to Geodatabase, Feature Class to Geodatabase (Multiple), Import Coverage Annotation to Geodatabase, Import from CAD to Geodatabase, Raster to Geodatabase (Multiple), Export to CAD, Import from E00, KML to Layer, Layer to KML, Map to KML, Multipatch to Collaborative Design Activity (COLLADA), WFS to Feature Class
54.	Packaging: Consolidate Layer, Consolidate Locator, Consolidate Map, Consolidate Result, Create Map Tile Package, Extract Package, Package Layer, Package Locator, Package Map, Package Result, Share Package
55.	Geotagged Photos to Points, Match Photos to Row by Time
56.	Analysis: Buffer, Clip, Intersect, Multiple Ring Buffer, Select, Spatial Join, Summary Statistics, Table Select, Union, Create Thiessen Polygons, Erase, Frequency, Identity, Near, Generate Near Table, Point Distance, Polygon Neighbors, Split, Symmetrical Difference, Tabulate Intersection, Update
57.	Spatial Statistics Tools—Analyzing Patterns: Average Nearest Neighbor, High/Low Clustering (Getis_Ord General G), Incremental Spatial Autocorrelation, Multi-Distance Spatial Cluster Analysis (Ripley's K Function), Spatial Autocorrelation (Moran's I)
58.	Spatial Statistics Tools—Mapping Clusters: Cluster/Outlier Analysis (Anselin Local Moran's I), Grouping Analysis, Hot Spot Analysis (Getis_Ord Gi*), Optimized Hot Spot Analysis
59.	Spatial Statistics Tools—Measuring Geographic Distributions: Central Feature, Directional Distribution (Standard Deviational Ellipse), Linear Directional Mean, Mean Center, Median Center, Standard Distance
60.	Spatial Statistics Tools—Modeling Spatial Relationships: Exploratory Regression, Generate Spatial Weights Matrix, Ordinary Least Squares Regression
61.	Spatial Statistics Tools—Rendering: Cluster/Outlier Analysis with Rendering, Collect Events with Rendering, Count Rendering, Hot Spot Analysis with Rendering, Z-Score Rendering
62.	Spatial Statistics Tools—Utilities: Calculate Areas, Calculate Distance Band from Neighbor Count, Collect Events, Convert Spatial Weights Matrix to Table, Export Feature Attribute to ASCII
63.	Multidimensional Tools: Feature to NetCDF, Make NetCDF Feature Layer, Make NetCDF Raster Layer, Make NetCDF Table View, Raster to NetCDF, Select by Dimension, Table to NetCDF
64.	Geometric Networks: Add Edge-Edge Connectivity Rule to Geometric Network, Add Edge-Junction Connectivity Rule to Geometric Network, Create Geometric Network, Remove Connectivity Rule from Geometric Network, Remove Empty Feature Class from Geometric Network, Trace Geometric Network, Set Flow Direction
65.	Data Indexing: Add Attribute Index, Add Spatial Index, Remove Attribute Index, Remove Spatial Index

B. Features for Geo-spatial Analysis:

<u>Sl. No</u>	<u>Specifications</u>
XVI.	Software should have the below mentioned spatial data analysis functionalities:
66.	Software should have the facility to create, query, map, and analyze cell-based raster data; perform integrated raster/vector analysis; derive new information from existing data; query information across multiple data layers; and fully integrate cell-based raster data with traditional vector data sources.
67.	Find suitable locations: Find areas that are the most suitable for particular objectives (for example, siting a new building or analyzing high-risk areas for flooding or landslides) by combining layers of information.
68.	Derive new information from existing data: Create Euclidean distance surfaces to understand the straight-line distance from one location to another, or create cost-weighted distance surfaces to understand the cost of getting from one location to another based on a set of input criteria you specify.
69.	Identify the best path between locations: Identify the best path or optimum corridors for roads, pipelines, or animal migration, factoring in economic, environmental, and other criteria.
70.	Perform statistical analysis based on the local environment, small neighborhoods, or predetermined zones: Perform calculations on a per-cell basis between multiple rasters, such as calculating the mean crop yield over a 10-year period. Study a neighborhood by calculating, for example, the variety of species contained within it. Determine the mean value in each zone, such as the mean elevation per forest zone.
71.	Interpolate data values for a study area based on samples: Measure a phenomenon at strategically dispersed sample locations and predict values for all other locations by interpolating data values. Create

		continuous raster surfaces from elevation, pollution, or noise sample points. With a set of point spot heights and vector contour data, create a hydrologically correct elevation surface.
72.		Clean up a variety of data for further analysis or display: Clean up raster datasets that contain data that is either erroneous, irrelevant to the analysis at hand, or more detailed than you need.
73.		Density Analysis: The density function distributes a measured quantity of an input point layer throughout a landscape to produce a continuous surface. Available density mapping tools include <ul style="list-style-type: none"> • Kernel Density • Line Density • Point Density
74.		Solar Analysis: The solar radiation analysis enables the users to map and analyze the effects of the sun. It works on how daily and seasonal shifts of the sun angle, along with variations in elevation, orientation (slope and aspect), and shadows cast by topographic features, affect the amount of incoming solar radiation. Microclimate factors, such as air and soil temperature regimes, evapotranspiration, snow melt patterns, soil moisture, and light available for photosynthesis, can all be accurately analyzed
75.		Hydrologic Analysis: Calculate flow across an elevation surface, calculate flow path length, and assign stream orders. 2D advection-dispersion modeling of groundwater flow and constituents in groundwater. Tool to generates a groundwater flow field from hydrogeological data. The Particle Track tool follows the path of advection (movement) through the flow field from a point source, and the Porous Puff tool calculates the dispersion of a chemical or constituent as it is moved along the flow path.
76.		Cell Statistics: In a local function, the value at each location on the output raster is a function of the input values at that location. When computing a local function, you can combine input rasters, calculate a statistic, or evaluate a criterion for each cell in an output raster based on the values of each cell from multiple input rasters.
77.		Neighborhood Statistics: Neighborhood functions create output values for each cell location based on the value for that location and the values identified in a neighborhood specified by the user.
78.		Zonal Overlay Statistics: Zonal Statistics tools calculate a statistic for each zone of a zone dataset based on values from another dataset.
79.		Multivariate Statistics: The Multivariate Statistics tools allow exploration of relationships between many different data layers or types of attributes. This collection of tools supports supervised and unsupervised classification and principal component analysis. These tools can be used not only for traditional image processing applications, such as transforming a multispectral image into a categorized land-cover map, but also for other statistical analyses of multivariate data, such as terrain stratification or habitat analyses.
80.		Scripting and Customization: <ul style="list-style-type: none"> • Create custom models and user interfaces. • Add your own analysis functions. • Use your own .dll or .exe files. • Support new formats. • Use Visual Basic (VB), VB .NET, C++, C#, Java, Python, VBScript, JavaScript, and others.
81.		ModelBuilder: The ModelBuilder interface provides a graphic modeling framework for designing and implementing geoprocessing models that can include tools, scripts, and data. Models are dataflow diagrams that link a series of tools and data to create advanced procedures and workflows. ModelBuilder is a productive mechanism to share methods and procedures with others within, as well as outside, your organization.
82.		Raster Generalization: The Raster Generalization tools are used to either clean up small erroneous pixels in the raster or generalize the data to remove or smooth out unnecessary detail. The erroneous pixels may be unclassified data originating from a satellite image, unnecessary lines or text originating from a scanned paper map, or imported data from another source.

C. Features for Interoperability with Different Format:

<u>S. No</u>	<u>Specifications</u>
XVII.	Software should have the below mentioned functionalities:
83.	Software should be integrated spatial ETL (extract, transform, and load) toolset that runs within the geoprocessing framework using Safe Software's FME technology. It enables you to integrate data from multiple sources and formats, use that data with geoprocessing tools, and publish it with GIS for Server.
84.	Software should have Read & Write support to the below mentioned formats:

	ACAD, AIXM, ARCGEN, ARCINFO, BMP, CDED, CGDEF, CITYGML, COLLADA, CSV, DATAFILE, DB2, DB2SPATIAL, DBF, DGNV8, DTED, DWF, E00, ESF, ESRIMSD, FACET, FFS, FILEGDB, FM0, FM0_SQL, GENERIC, GEODATABASE_FILE, GEODATABASE_MDB, GEODATABASE_SDE, GEOJSON, GEORSS, GEOTIFF, GG, GML, GMLSF, GOOGLE_SPREADSHEET, GOOGLEFUSIONTABLES, GOOGLEFUSIONTABLES_DB, GPX, GRD, IDRISI, IFC, IFF, IGDS, INFX, INFXSPATIAL, JSON, KF85, LAS, MASIK, MCF, MDB_ADO, MGE, MIF, MITAB, MSSQL_ADO, MSSQL_SPATIAL, NULL, OBJ, ODBC2, OGCKML, ORACLE, ORACLEPOINTCLOUD, POINTCLOUDXYZ, POSTGIS, POSTGRES, QLF, REGIS, SALESFORCE, SDE30, SDL, SHAPE, SPATIALITE, SQLITE3, SQLLDR, STRUMAP, TEXTLINE, TOP10, UFO, WHITESTAR, XLS_ADO, XML
85.	Software should have capacity to Read the below mentioned formats: ADAC, AIS, AIXM5, ARCGISMAP, ARCGIS_LAYER, ARCPADAXF, CAT, CIVIL3D, DLG, DMDF, DNF, DSFL, EPA_GDXML, GDMS, GENAMAP, GEODATABASE_XML, GEOHASH, GEONET, GML212, ISO8211, IUF, JOBXML, LONDONLINE, LANDXML MOEP, NEN3610, NTF, OGEOSMS, OSM, OSVECTORMAPDISTRICT, OSVECTORMAPLOCAL, PCARCINFO, PHOCUS, RDB, RDB_PROJECT, S57, SAIF, SCHEMA, SCHEMA_FROM_TABLE, SDTS, SEG-P1, SKETCHUP, SLF, TIGER, TIGERGML, TOP50NL, VPF_DB, VRT, WFS, WKB, WKT, XDK, XYZ, Z-MAP_ASCII, ZFS, ZGF
86.	Software should have capacity to write the below mentioned formats: 3DS, EPS, FILECOPY, GIF, IEPS, SVG, VML, VRML, X3D, X3D_VRML, ZMAP, PDF, PDF2D
87.	Direct Read: Direct-read formats enable you to work with nonnative datasets directly in the Desktop without using any intermediate format or conversion tool. They are translated on the fly as read-only datasets and displayed in memory while the source file remains on disk in its native format.
88.	Interoperability connection: An interoperability connection is a user-created link to one or more data sources that is managed in the Catalog tree as a single direct-read dataset. The connection specifies the data source and the FME reader and any parameters supported by the chosen format.
89.	Data Interoperability toolbox : The Data Interoperability toolbox contains out-of-the-box geoprocessing conversion tools that import and export data between geodatabase and nonnative formats using FME readers and writers

D. Features for Geo-statistical Analysis:

Sl. No	Specifications
VIII.	Geostatistical Analysis functionalities
90.	The software should have powerful spatial statistics tools for surface modeling using deterministic and geostatistical methods
91.	The software should also include Exploratory Spatial Data Analysis tools to examine the data distribution in more quantitative ways like Histogram, Normal QQ Plot and General QQ Plot, Trend Analysis, Voronoi Map, Semivariogram/Covariance Cloud and Crosscovariance Cloud
92.	The software should provide a Wizard based tool to guide the user through the process of constructing and evaluating the performance of an interpolation model
93.	The software should have Gaussian Geostatistical Simulations tool for performing a conditional or unconditional geostatistical simulation based on a Simple Kriging model
94.	The software should have comprehensive tools to perform interpolation including Areal interpolation, Empirical Bayesian Kriging, IDW, Diffusion Interpolation With Barriers, Global Polynomial Interpolation, Kernel Interpolation With Barriers, Local Polynomial Interpolation, Moving Window Kriging and Radial Basis Functions
95.	The software should provide various Kriging and cokriging prediction methods to produce a surface of predicted values including Ordinary, Universal, Simple, Indicator, Probability and Disjunctive
96.	It should be possible to classify geostatistical layer in standard ways like Equal interval, Quantile, Geometric intervals and manual/interactive method to spot patterns in the data more easily
97.	It should also have tools to create Spatially Balanced Points and Densify Sampling Network to assist in the placement of new sampling sites and to determine which sampling sites are no longer required respectively
98.	The software should have the facility to compare the predictions displayed in two or more mapped surfaces to make an informed decision as to which model provides more accurate predictions based on cross-validation statistics
99.	It should be possible to export the geostatistical layer to Contour (isolines or filled contours-polygons), Grid

		and Points
100.		The software should have the facility to automate geostatistical interpolation by providing a mechanism for applying interpolation parameters to new datasets.

4.2.1.2 Technical Specification of ArcGIS Server Software of latest version and release

A. Features for Server Based GIS-Vector Functionalities:

<u>Sl. No</u>	<u>Specifications</u>
XIX.	Software Should have the below mentioned functionalities:
101.	The software should have powerful spatial statistics tools for surface modeling using deterministic and geostatistical methods
102.	Server based GIS should Support any client and device including mobile, smart clients, web browsers (Internet Explorer, Google Chrome and Firefox), geoexplorer applications and desktop applications.
103.	Server Software should run as a native 64-bit application and should support Windows 64-bit and Linux operating systems 64-bit.
104.	It should be possible to deploy in a virtualized environment and support vSphere and vCenter.
105.	Support service-oriented architectures (GIS on the enterprise service bus).
106.	Support portal standards like JSR-168, UDDI, CSW from OGC, web portal frameworks, and APIs [.NET, Java]).
107.	It should be possible to create and manage a central spatial information repository using relational database management systems, including IBM® DB2®, IBM Informix® Dynamic Server, Microsoft® SQL Server®, Microsoft® SQL Server® Express, Microsoft® SQL Azure®, Oracle®, PostgreSQL and Netezza.
108.	The Server software should support Replication across multiple commercial databases in connected and disconnected environments.
109.	Should support unlimited number of spatial data editing and viewing by desktop, web browser and mobile clients.
110.	Should support Web server / application server like IIS, Tomcat, Glassfish, Web Sphere and Oracle Weblogic.
111.	Should support Web Services including Map, KML, WMS, WCS, WFS and WFS-T. REST and SOAP.
112.	It should have variety of ready to use web mapping applications /APIs like Viewer for Flex, Viewer for Silverlight, Maps for SharePoint, Maps MS Office. The software should also provide APIs for developers to build custom web mapping applications like API for JavaScript, API for Flex and API for Silverlight.
113.	Should have option to create geographic database, manage geographic database, load spatial data into spatial database.
114.	Should be possible to publish and share geographic data (2D & 3D), maps, analyses, models.
115.	Should have out of the box Web Application Functionalities like pan, zoom, identifying features on a map, feature based hyperlink, measure distance, maptips, interactive north arrow, magnification window, overview window, find place, query attribute, search attribute, editing, geo-processing tasks etc.
116.	Should support server-based analysis and geo-processing, including vector, raster, 3D, and network analysis as well as models, scripts, and tools
117.	Should have Web Editing Application Functionalities like simultaneous Feature class editing, isolated editing in separate versions, Undo/Redo operations, snapping by layer, snapping to new geometry, settable snapping, modify, merge, split features, specify an Exact X,Y location, modify and create attribute values, maintain attribute values through defined rules (Domain), any custom component based Tool for editing.
118.	The application should provide an out-of-the-box, configurable mobile application that allows dynamic query and update server data remotely. The mobile application should be able to integrate with GPS devices.

B. Features for Server Based GIS-Raster Functionalities:

<u>Sl. No</u>	<u>Specifications</u>
XX.	Web or Application based Image Access:
119.	Image services should provide fast and simplified web access to imagery.
120.	Should support a large range of web standards, including WMS, WCS, KML, SOAP, and REST.
121.	Image services should OGC compliant (WMS, WCS).

122.	Image services should allow serving - Raster datasets directly without requiring data conversion, images as a background, raster data for analysis
123.	Client users and applications can - Change image compression for low-bandwidth networks, define projections, control sampling methods
124.	Use in multiple applications - Users need access to the same imagery in different Web and workstation applications.
125.	Access to large expanse at high resolution - Users should be able to view very large areas at both small and large scales and in different projections without needing to select specific images or tiles.
126.	Fast access to geospatial imagery - Software should provides access to source imagery without requiring any preprocessing, eliminating data redundancy and making imagery available to clients quickly. Plus, clients can access the imagery they need almost instantaneously, without lengthy load times.
127.	On-the-fly image processing - Software should processes source data on the fly, minimizing storage requirements and reducing the latency between data capture and use by staff.
128.	Data and client interoperability - Software should provides access to multiple image file formats from multiple clients, eliminating the need to convert source data into proprietary formats.
129.	Ability to export or print - Users often need to export clips of imagery to their local machines or mobile devices for access when they are not connected to the source, such as a database or server, or to print the data. The size of such image requests can be very large.
130.	Quick updates - New imagery or processing parameters can be quickly added or changed in existing image services without interrupting the services.
131.	Extensive coordinate transformation capability - This capability resolves many issues that occur with imagery in different spatial reference systems.
132.	Handles disparate datasets - Imagery is often not in well-defined rectangular blocks but is spread among different areas of interests such as along roads. Traditional systems that require a single image format or size cannot handle such cases.
133.	Scalable to massive amounts of imagery and large numbers of users - This capability makes it easy to get the system up and running as well as expand as the imagery or number of users increases.
134.	Integration - Imagery can be integrated into existing infrastructures by leveraging the plug-ins to other applications and using the Web standards' support to deliver the imagery.
Client Based Application:	
135.	Should able to request the server to provide information and metadata on available image services.
136.	Should able to open a connection to an image service and make imagery requests.
137.	Should able to view and extract both imagery and associated image metadata.
138.	Should able to interact with and modify image service properties. These properties include the mosaic method that controls the order of overlapping images as well as the spatial reference system, resampling method, transmission compression, and background color.
139.	Should able to save the imagery to disk by specifying the extents, pixel size, and file format in which it should be saved (such as TIFF, JPEG, JPEG 2000, and PNG). The maximum volume (and extent) of exported imagery is controlled by the administrator of the image service.
Server Based Radiometric Image Processing:	
140.	Image algebra and NDVI - Enables different bands of imagery to be processed together, often for better feature definition. A typical example is the Normalized Difference Vegetation Index (NDVI), which indicates biomass (greenness).
141.	Spectral matrix - Transforms the color space of imagery. It can be used, for example, to convert false-color imagery, such as SPOT, that does not have a blue band into a pseudocolor image that looks more natural.
142.	Trend - Changes the radiometry of an image based on a correction surface, which can be used as a simple method to remove brightness trends in images. Such brightness trends are often seen in aerial and satellite imaging where one side of the image is brighter than the other.
143.	Classify - Applies a simple classification of pixels to the rasters used in the image service for feature discrimination. Pixels can be classified based on the different ranges of their values. Generally, classify is applied in conjunction with another process that involves computations such as NDVI and image algebra.
144.	Color map - Transforms pixel values to display raster data as either a gray scale or red, green, and blue (RGB) image, based on a color map. This process can be used to display rasters representing analyzed data, such as a classified image, or to render a topographic map.
145.	Elevation visualization - This operation renders (displays) elevation data using various methods of visualization such as hillshade or shaded relief.
146.	Histogram - This process extracts a histogram and histogram statistics based on the image, which will be included with the image service as part of the process metadata.

Server Based Geometric Image Processing:	
147.	Affine - A simple, six-parameter transform that is used to map most mosaicked or rectified imagery to a specific projection. It can be specified by the six parameters of a list of at least three points in the image and ground space.
148.	Projective - A nine-parameter transform that is often used to map the four corners of an image to a defined footprint. It can be specified by the nine parameters of a list of at least four points in the image and ground space.
149.	Second- and third-order polynomials - These are standard formulas for representing higher-order distortions.
150.	Warp grid - This enables the modeling of a more complex transformation by defining a grid of points in both image and ground space.
151.	Orthorectification - Orthorectification of imagery is based on a sensor model and elevation model. Two main sensor models are supported: standard frames are used in most aerial photography, and rational polynomial coefficients are used with many satellite sensors. Other sensor models can also be added.
Server Based Mosaic Methods	
152.	Closest to center - This is the default method that orders the imagery based on the distance between the image center and the screen center such that the closest image is on top.
153.	Closest to viewpoint - With this method, the location or direction from which the area should be displayed can be defined to allow users to see around occlusions as well as the sides of buildings. It is used primarily in utility and emergency response type applications.
154.	Most northwest - This mode is similar to closest to center but keeps a fixed order based on the image that is most northwest being on top.

C. Scientific Data Analysis Software

<u>Sl. No</u>	<u>Specifications</u>
XXI.	Software should have the below mention functionalities:
155.	2D Graphics & Image Display: Line plot, scatter plot, histogram, bar plot, Error bar plot, polar plot, vector flow plot, den- drogram, Contour plot, multiple contour levels & fill, Image display Zoom & pan Annotation, RGB, HLS, HSV, indexed color display, Contrast enhancement, Animation, 2-D transformations, Image tiling, Double precision plot, Date/time, Linestyle, pattern, plot symbols Log, semi-log & linear scaling Overplot multiple data sets
156.	3-D Graphics: Surface, 3-D scatter plot, isosurface, isocontour, Streamline & particle trace, 3-D object rendering, Volume rendering, Flat & Gouraud shading, Texture mapping, 3-D symbols & text Lighting model effects Interactive light object editor Opacity & layering control Surface area & volume, 3-D transformations, Mesh generation from volumetric data, Mesh surface plots with hidden line removal Mesh operations for polygonal & tetrahedral meshes, Multiple clipping planes, Decimation, Smoothing, Interactive DXF viewer
157.	Image & Signal Processing : Continuous & discrete wavelet transform Frequency domain (FFT) filtering & analysis Convolution & frequency-domain block convolu- tion, Generalized image arithmetic, Image statistics Spectral analysis Time-series analysis, Watershed segmentation, Bi-level, pseudo- & true-color thresholding, Histogram equalization, High- & low-pass filtering, Edge enhancement: Canny, difference of gaussians, emboss, Laplacian, Prewitt, Roberts, Sobel, shift difference, Morphological operators: erode, dilate, distance mapping & thinning, Noise reduction & image restoration: Butterworth, band pass, band reject, hurl, impulse response, least squares, mean, median, order statistic, pick, Savitsky-Golay, scatter, slur, Wiener, Geometric transformations: magnification, reduc- tion, rotation, polynomial warping, Region growing Region of interest Unsharp masking Hough transform Radon transform Lomb periodogram Mixed Radix
158.	Wavelet Toolkit : Interactive interface, Multiresolution analysis
159.	Differentiation & Integration : Differential equations: adaptive & Runge-Kutta Iterated Gaussian quadrature, Newton-Cotes integration of tabulated data Romberg integration over an open or closed interval, Simpson integration over a closed interval
160.	Linear Algebra: LAPACK, Numerical Recipes Condition number Determinant Generalized inverse Transpose, Infinity & Euclidean norms Eigenvectors & eigenvalues Singular value decomposition, Cholesky, Gauss-Seidel, LU, Cramer's, least squares, & tridiagonal methods for solving systems of linear equations

161.	Curve & Surface Fitting: Multiple linear regression Nonlinear least-squares, Gradient-expansion Levenberg-Marquardt, Singular value decomposition Polynomial spatial warping, Polynomial surface, Weighted/unweighted least-squares polynomial, Thin plate spline
162.	Correlation Analysis & Forecasting: Auto & cross covariances/correlation Autoregressive modeling/forecasting, Cluster analysis, Differencing/box-car smoothing, Discrete auto/cross correlation, Exponential, geometric, Gompertz, hyperbolic, logistic & logsquare growth models, Kendall & Spearman rank correlations, Lagged auto & cross correlations Least-absolute-deviation fitting Linear, multiple & partial correlations Moving averages/smoothing, Multiple linear regression, Multiple correlation, Nonlinear least-squares fitting, Partial correlation Principal components Statistical fitting of data
163.	Multi-Dimensional Gridding & Interpolation: 1-, 2- & 3-D nearest-neighbor & linear; 1-, 2- & 3-D cubic convolution, 2-D parametric cubic splines, N-D Delaunay triangulation, convex hulls & Voronoi polygons, 2-D interpolation, Inverse distance, Faulting Kriging Linear, Minimum curvature Modified Shepard's Natural neighbor Nearest neighbor Polynomial regression Quintic, Radial basis function, 3-D minimum curvature surfaces, 3-D polar (r, theta, z) to rectangle, 4-D smooth fit, Spherical gridding Non-uniform gridding
164.	Development & Programming Features: High level, array-based interpretive language, Language features similar to C, C++, Java Graphics functions with dot (".") syntax simplifies the control of objects & properties, Automatic object garbage collection, Operator overloading, No limit to number of variables, compiled program size, program file names or structure tags Internationalization routines that convert strings from one encoding to another, Support for large files (>2GB), Call Windows DLLs or UNIX sharable object libraries, Export program objects into COM/Java Import COM/Java objects out-of-process server, Run time distribution options

D. The Capacity Level of Server ArcGIS of latest release and version

Sl. No.	Description	Capacity Level For Enterprise Edition
1	Simultaneous connections to multiuser geo-database	Unlimited
2	Multiuser geo-database storage capacity	Unlimited
3	Maximum number of licensable cores	Unlimited
4	Distributed deployment of GIS Server components	Supported

E. Server ArcGIS of latest version and release should support the following types of Web services:

Sl no	Web Services
1	Geodata
2	Geocode
3	Geometry
4	Geoprocessing
5	Globe
6	Image
7	Keyhole Markup Language (KML)
8	Map
9	Mobile
10	Network Analysis
11	Web Coverage Services(WCS)
12	Web Feature Service (WFS) and Transactional Web Feature Service (WFS-T)
13	Web Map Service (WMS)

4.2.1.3 License:

Lifelong Fail-Over License of Server ArcGIS software for both Active and Passive Servers **as per hardware Configuration** of activating the Passive license in case of failure of the Active Machine automatically. In case

of failure of Active server, the switchover to passive machine should be Automatic and Immediate without loss of data.

4.2.1.4 Technical Specification of Database Server software functionalities of latest version and release

Operating Systems Supported	Red Hat Enterprise Linux(RHEL) latest proven version.
Important Functionalities of database	<ol style="list-style-type: none"> 1. Database should be of enterprise class & from market leader in the database category. 2. Ability to service concurrent multiple read and write requests without the need of building separate replicated environments. Should have the ability to handle deadlock situations, without any application slowing. 3. Database must have option of deploying on multiple servers configured with active-active clustering with the objectives of scalability and availability of 24x7. In case of any server down database operation should be continue without any downtime. All the server connected in cluster (for future requirements) must be used actively by users for the purpose of load balancing across servers. 4. Database should be available and function in multiple operating systems like Linux, Unix, Solaris & Windows 5. Should have built-in parallelism, Backup & Recovery feature, Disaster Recovery Feature, recovery for tables, rows accidentally deleted, Queue Mechanism to transfer data across to other database. 6. The database software should be able to scale up multiple terabytes in decentralized and centralized environment. The database should be able to store gigabytes of data in single row. 7. Database must ensure inter-dependency of user concurrency and data consistency. Should provide non-escalating lock mechanism and multi version read consistency for the transaction processing. 8. Should be able to provide database level storage management mechanism, which should enable the availability by means of creating redundancy, automatically balance the data files across the available disks, I/O balancing across the available disks for the database for performance, availability and management. 9. Database should have option of native, active-active clustering with objectives of scalability and availability of 24x7 to take care of future requirements. 10. Database should have mechanism to protect data against human error. 11. Should support option of different partitioning schemes within the database (Range, List, Hash & combinations) to split large volumes of data into separate pieces or partitions, which can be managed independently. The partitioning should enhance the performance, manage huge volumes of data and should provide foundation for Information Life Cycle Management (ILM). 12. The database should have option to create, use the logical partitioning of the objects (like Tables, Indexes) and use them. The option should be able to help in creating / managing the logical components online and be independent of the application solution being deployed. 13. The database should be having built-in, auto installed utility for managing the database over LAN and WAN using browsers without any additional

	<p>client software installation.</p> <p>14. Should provide Single system management view for database / database cluster. Should be using client independent, centralized database management console over network for monitoring hardware, operating system and database resources.</p> <p>15. Should be having built-in provision to Administer database / database clusters, Monitor performance, Maintain database, Backup and recovery, Disaster recovery management, diagnosis, performance tuning with the SQL analysis, finding the events, advisory based tuning mechanisms with the history.</p> <p>16. Database should provide native special capabilities so that spatial data can be kept in same database table like any other data.</p> <p>17. Database should have option to support full 3D Data Model (3D Geometrics, surfaces, TINs, Point Clouds), all geospatial data including vector and raster data, topology, and network models</p> <p>18. Database should have option to support Linear referencing system, GeoRaster data type, Topology data model, spatial analytic functions, Geocoding</p> <p>19. Database should have option to support Triangulated Irregular Network (TIN) data Type</p> <p>20. Should provide Rtree (fast, self-tuning and scalable) indexing on spatial data.</p> <p>21. Database should have automated/manual performance analysis with detailed diagnosis of the cause of performance related issues with possible resolutions.</p> <p>22. Database should have self-diagnostic engine (automatic database diagnostic monitor) inbuilt into core database.</p> <p>23. Database must have automated/manual identification and tuning of high load SQL Statements. Provide details about dynamic tuning capability of the database depending on workload requirement, system resources etc</p> <p>24. Database should have the capability to tune SQL without changing the SQL code.</p> <p>25. Database should be able to provide recommendations for new index requirement and restructuring of SQL statement</p>
Warranty:	3 years comprehensive support

4.2.1.5 Database Software (for two servers in Active, Passive configuration)

Product	Licenses
Oracle Database 11g Enterprise Edition Release 2(11.2 or higher proven version)	as per para 4.2.1.6
Complete Media Set For compatible Operating Systems	1
Annual Technical Support for the above mentioned products	3 years for upgrades, updates and patches etc.

4.2.1.6 License:

Lifelong Fail-Over License of **database software** for both Active and Passive Servers **as per hardware**. Configuration of activating the Passive license in case of failure of Active server, the switchover to passive machine should be automatic and immediate.

4.2.2 Hardware:

4.2.2.1 Rack Mount Server (Quantity - 4 Nos.)

Parameters	Specifications
Motherboard:	TPM motherboard
Processor:	Intel® Xeon® Processor E5-2600 series (with 20MB Cache, 2.4 GHz, 8 core, 64-Bit) or better.
No of processors:	Two
Memory:	64 GB RDIMM expandable, 1333MHz DDR3 or higher with scalability upto 256GB or More
Disk Storage:	8X300GB, 10K RPM (or higher), SAS 2.5" hot swappable hard drive with scalability
RAID Controller:	SAS RAID Controller with RAID 0, 1 & 5 with 512MB or higher battery backed write cache (onboard or in a PCI Express slot).
Power Supply:	N+1 Hot Plug Redundant Power Supply with separate AC inlets for all power modules.
Cooling:	N+1 Hot Plug system redundant fans
Network:	Integrated Gigabit Server Adapter Port with minimum Four 1 Gb Ethernet controller
I/O Ports:	USB 2.0/ higher , RJ45 Ports, one VGA/ SVGA
DVD Optical Drive(R/W):	Internal DVD Writer with 16X write speed or higher.
Server Management Software:	Web based Intelligent Manageability having the following features: - <ul style="list-style-type: none"> •IPMI ver 2.0 or higher implementation with a dedicated network interface for out-of-band management. •Support Remote Access & Remote monitoring •Server trouble shooting •Health Indicator and Corrective Action including Automated Power Cycling • Automatic Server Recovery •Raid Array Diagnostic Tool with ability to view Disc status and array status with pre-failure warning capability.
Storage Management:	RAID 5 with Intel® Integrated hardware RAID Module
Operating System:	Red Hat Enterprise Linux(RHEL) latest proven version.
Administration:	Local as well as via Integrated Remote Access Controller
Warranty:	3 years comprehensive on-site

4.2.2.2 Desktop (Quantity - 2 No)

Parameters	Specifications
CPU:	intel® Core™ i7-2600 (3.40 GHz, 8 MB cache, 4 cores) or better
No of processors:	Four
Chipset:	Intel Q 67 or better on OEM Motherboard.
Bus Architecture:	46PCI (PCI/ PCI Express)
Memory:	16 GB 1333 MHz DDR3 SDRAM expandable, or better
Disk Storage:	250 GB expandable to 1TB SATA (7200 rpm).

Monitor:	47 cm or larger (18.5 inch or larger) TFT/LED Digital Colour Monitor TCO-05 certified.
Keyboard:	104 keys.
Mouse:	Optical with USB interface
Bays:	3 Nos. or above.
Ports	10 USB 2.0 Ports and higher (with at least 2 in front), audio ports, for microphone and headphone in front.
Cabinet	Tower(Mini)
Optical Drive:	SATA DVD writer
Power Management:	Screen Blanking, Hard Disk and System Idle Mode in Power On, Set up Password, Power supply SMPS Surge protect
Networking facility:	Integrated Intel 82579LM Gigabit Ethernet; Intel Pro 1000 CT Gigabit; 802.11 b/g/n wireless on board integrated Network Port with remote booting facility remote system installation, remote wake up, out of band management using any standard management software.
Operating System (64bit)	Windows latest proven version preloaded, compatible with ArcGIS Desktop Software as specified, with Media, Documentation and Certificate of Authenticity.
Preloaded Software:	Norton or McAfee or Trend Micro Antivirus (Latest Version) with three Year License .
OS Certifications :	Windows 8 OS(64 bit)
Security management :	Trusted Platform Module (TPM) 1.2 ,Stringent security (via BIOS), SATA port disablement (via BIOS),Drive lock, RAID configurations Protect Tools Security Software Suite Serial, parallel, USB enable/disable (via BIOS) USB Port (user configurable via BIOS) Removable media write/boot control, Power-On password (via BIOS) Setup password (via BIOS),HP Solenoid Hood Lock/Sensor Support for chassis padlocks and cable lock devices
Administration:	Local as well as via Integrated Remote Access Controller
Warranty :	3 years comprehensive on-site

4.2.2.3 KVM SWITCH (Quantity -1No) compatible to the servers offered with following specifications:

Parameters	Specifications
No. of Hosts to be Managed	8
VGA Resolution Supported	1600x1200 or 1680x1050 (widescreen) native.
Console Interface	Accepts either PS/2 or USB keyboards and mice.
Connectivity Interface	Dual interface - supports computers with PS/2 or USB keyboards and mice
Switching:	Hot-Key and front push-button switching
Indicator:	Lighted front panel buttons indicating connections and status.
Emulation:	Complete keyboard and mouse emulation for error free booting and real time switching
Power Supply Sensing:	Auto-sensing power supply built directly into the switch.
Host Scanning:	Auto-scanned monitoring of attached computers on regular intervals without manually switching from port to port

Installation Methods:	Mounted in the racks
Console Cables Required:	6Nos. of 2 meter Dual PS2/USB along with VGA Cables required for connecting 8 systems
Warranty:	3 years comprehensive on-site

4.2.2.4 KVM Console (Quantity-1No): compatible to the servers, offered with following specifications:

Parameters	Specifications
No. of Hosts to be Managed	8
Form Factor	Rack Foldable TFT in 1U form factor with enough room to mount a KVM switch behind it
Size	17" diagonal WXGA+ monitor or better
Technology	Flat Panel TFT active matrix with Backlit panel technology to maximize brightness and off-axis viewing angles
Resolution	At least 1600 x 900 at 75 Hz
Aspect Ratio	16 x 9 or better
Keyboard/Mouse Output	PS2 and USB connectors
Scroll Keys:	Four Scroll Keys in inverted T fashion located between the keyboard and numeric keypad for easy access.
Cable Management:	Fully integrated cable management arm.
Certification:	Energy star certified console, TCO-5, ROHS
Warranty:	3 years comprehensive on-site

4.2.2.5 STORAGE AREA NETWORK (Quantity -1No):

Parameters	Specifications
SAN Storage Capacity	20 TB usable capacity with RAID 5 configuration.
RAID controller:	Dual Active Controller with no single point of failure in the storage array
Cache:	(i) It should be configured with minimum 16 GB usable cache and shall be scalable up to 32 GB (ii) It should support de-staging of cache to disks on power down or shall support internal battery backup for at least 48 hrs. The data shall not be lost in case of power failure. The features are to be made available with the system.
Host Interface:	(i) It should be configured with minimum 4 numbers of 8 Gbps FC, front-end ports. For aggregate FC bandwidth to the host should be 64 Gbps.. (ii) System should support iSCSI ports with minimum number of 4(1Gbps) ports.
Drive Interface:	Storage should support at least 24 Gbps of backend bandwidth (or equivalent number of ports) to disks using SAS or FC connectivity.
Support Drives:	Storage system shall support Hot Swap 450/600/900 GB FC/SAS 15k RPM drives.
RAID Levels:	0,1,5
SAN Supported:	All standard SAN switches need to be supported.
Disk Scalability:	The storage should be configured with required usable capacity of 20 TB using Hot Swap 450/600/900 GB SAS 15k RPM drives and should be scalable up to 40 TB usable capacities with RAID 5 configuration using same drives.
Availability :	(i) It should offer dual active-active and failover controllers, redundant power supplies and

	cooling units with support for hardware based RAID 0, 1, 5 and 10 and support for LUN Masking and software for the same should be configured (ii) It should support Non-disruptive component replacement of controllers, disk drives, cache, power supply, fan subsystem etc. (iii) Storage should support High Availability clusters solution for HP, IBM, EMC, Sun and window etc..
Licensing:	All relevant software licenses required for the device (like storage array management, multipathing, High Availability etc.) should be provided for life time and shall be configured in the system.
Management:	Configured with GUI base management software: <ul style="list-style-type: none"> •Monitor and manage the storage array •Configuring PIT's •LUN management. •Storage Component replacement, etc.
Operating System Support	The storage system shall support the latest OS releases & Cluster of the following mentioned servers / OS:- CISC/RISC/EPIC-based Servers running Microsoft, HP, IBM, Sun, Linux .
SAN SWITCH	2 Number of FC 8 Gbps SAN switch should be supplied, each populated with 24 ports.
Warranty:	3 years comprehensive on-site

4.2.2.6 Rack (Quantity -1No):

One Rack with proper arms and channels, power points and proper perforated doors (front and back both side) with cooling arrangement etc., for servers sufficient to accommodate at least six servers, storage and network equipments, KVM console and KVM Switch and other associated accessories etc. with following specifications:

Parameters	Specifications
Rack Heights	42 U
Side Panels	Standard Removal Lockable Side Panels
Doors	Lockable perforated front and rear doors Split Rear doors
PDU& Mounting	2 Nos. Single Phase 12 socket 0/1U PDU with Circuit Breaker. PDU mounting should be tool-less
Side Wall Compartments	Six sidewall compartments to support installation of 1U PDUs and switches without unnecessarily taking up valuable rack space Top Cable Exits
Cable Management	1. Front cable access portals and a large rear adjustable opening to provide improved overhead cable management. 2. Bottom Cable Exits. 3. Velcro clips pack.
Stabilizers	Standard front and side stabilizers for static rack stability when equipments are routinely installed, removed or accessed
Leveling Pads	4 easily adjustable leveling pads ensuring stability and preventing rolling on casters
U Markings	Clear U markings on mounting rails to aid in space planning and installation
Casters	Fixed front and rear swivel heavy duty casters that can easily accommodate the maximum load capacity, while still being less than 2 meters in height to allow the rack to fit under most doorways
Hinges	Quick release hinge design to allow the front door to be easily mounted on either side of the cabinet. This provides for flexible placement alternatives, due to opening of door either direction
Rack Cooling	Top Exhaust system along with fans. The rack should have air flow optimization.

Blanking Panels	1U 100-pack Carbon Universal Filler Panel
Rack Lighting	Rack light system mounted on the rack roof and used to provide light to the rear section of rack.
External Height	78.74/2000 (inches/mm)
External Depth	47.24/1200. (inches/mm)
Load Capacity:	At least 900 Kg.
Warranty:	3 years comprehensive on-site

Chapter 5

QUALIFICATION CRITERIA

ELIGIBILITY TO BID

(i) For hardware/software related items in Chapter 4, a bidder should be a reputed OEM or a dealer of the OEM or System Integrator (SI), Indian reputed SI and having valid MOU with OEMs will only be eligible in this tender. The MOU agreement must indicate the commitment of OEM/ back-to-back support agreement with OEM for meeting all the contractual obligations and shall be required to be submitted (to be submitted in Technical Bid envelope) at the time of bid.

(ii) The bidder should have annual turnover of minimum Rs 20 crores with profit from hardware/software sales, warranty and website/portal development averaged over the last three financial years. Copies of balance sheets with concerned schedule/note/ profit and loss statement along with CA reports and ITR of last three financial years (upto 31st March, 2013) should be enclosed.

(iii) The bidder should have experience in website creation / development (static, dynamic, CMS, static cum dynamic GIS), maintenance & other related matters for a period of at least past three financial years as given below:

a) The bidder should have experts/ professionals/ developers in the field GIS, CMS, dynamic aspects of website development, implementation, operation, maintenance and support service having suitable degree in the relevant fields and at least 5 years working experience. Evidence to be provided in the form of work order supported by customer certificate or and job completion certificate.

b) The concerned bidder must have developed minimum two portals/websites of similar nature with static, dynamic, CMS and GIS contents during the last five financial years, out of which 1 such portals/websites must be for Ministries/Departments of Central Governments/ Central PSU/State Govt. The executive summary and technical details of the Application should be submitted with the bid. The application developed on Web GIS platforms like ESRI, Geoserver, Open Layers, ERDAS Apollo Map Server, GeoMedia etc will be treated as GIS application. The application developed on online maps APIs like Google Maps API or Bing Maps API will not be treated as GIS application. The bidder has to furnish necessary documentary evidence in support of this on their letter head, along with supporting documents.

c) Having managed/ maintained for minimum two years for at least two portals/websites of similar nature as described in above point. Proof in this regard should be submitted along with the bid.

(iv) The relevant experience of OEM/ bidder/SI will be considered for eligibility. The OEM/ bidder/SI should have executed at least two work orders of similar in nature within last five years to qualify experience criterion (proof must be submitted along with the technical bid).

(v). It is compulsory to bid for all items mentioned in the "Technical Specifications" in Chapter 4 and as per Scope of work mentioned in Chapter 3 including the requirements mentioned in remaining sections of the document.

(vi) . The Solution should be on Industry Standard Technology and products should be OGC compliant.

(vii). All bidders/ SI/ OEM are not black listed by Government of India or any central PSU or any State Government.

IMD will expect bidders' knowledge and experience to followings-

A. Frontends:

HTML 4.0/5.0, DHTML, XML, CSS, JAVA/VB Scripts, Animation Tools, ASP, .Net, JSP, PHP, AJAX, Flex, Silverlight

B. Web Server

Http, https, IIS, Tomcat (7 or higher version), Apache (Latest version); Installation, Configuration, Response optimization etc.), NGINX and GWS

C. Web Security.

SSL and VPN features and configuration.

D. Data Server / RDBMS

ORACLE.

E. ArcGIS Server software from ESRI.

F. Browser Dependency

The developer will ensure compatibility with latest version of major Internet browsers like Internet Explorer, Mozilla Firefox, Opera, Google chrome and micro browsers for mobiles like safari, etc and the site should be functional over all desktop, laptop, palmtop, other handheld devices, smart phones /tablets viz. iOS, Android, and Windows Phone. Bidders are encouraged to share and follow “best practice” for the implementation of their solution.

G. Proof of knowledge eligibility in GIS desktop, GIS Server (latest versions), Python (scripting environment), GIS online and Microsoft Server and a server-software sub-system that aims to enable the usage of Relational Database Management Systems for spatial data. The spatial data may then be used as part of a geodatabase. Geoportals, map production in Adobe Illustrator, meta data handling, image processing software, UML for spatial data modeling, OGC standards for geographic information and ISO 19135, writing technical reports in Hindi and English Languages.

The bidder should provide the required general information in the prescribed format as per Annexure-B.

Chapter 6

DELIVERY SCHEDULE

The bidder is required to stick to the agreed upon time-schedule given below.

TABLE – I: Major Activities

S. No.	Milestone	Deliverables (Incremental Weeks)
1.	Placement of Purchase Order	T
2.	SRS Study, Preparation of SRS, Freezing of SRS, Analysis & design of Databases, Designing and Submission of at least five alternatives Website designs, Approval of SRS, delivery of server, desktop, Load balancer, software, GIS software, O/S, application software, other related items etc. as per description in chapter 4.	T+6
3.	Approval of Website and any changes/ modifications thereof	T+8
4.	Coding and development of GIS, CMS based Website	T+20
5.	Quality Assurance and 3rd Party Security Audit with bug fixing	T+22
6.	Deployment and pilot run	T+25
7.	Uploading& hosting and handover to IMD (i.e. SAT)	T+30
8.	Three years comprehensive onsite warranty with technical support, Maintenance of Website from the date of acceptance	
9.	Two years comprehensive A. M. C. (optional but to be quoted)	

*T will be remaining constant; deliverables for subsequent milestones will work parallel.

Chapter 7

WARRANTY

3 years on- site comprehensive warranty with technical support for the project

The bidder shall provide **three-year** on-site comprehensive warranty with technical support to address, analyze and fix any technical glitches within the existing features. The scope of technical support includes rectification/debugging of errors present within the already developed code including entire software and hardware. **Future Binding AMC Arrangements:** After expiry of initial three years comprehensive warranty, IMD may extend this period further by one year at a time at its own terms and conditions and AMC charges to be decided upon, provided the firm services during the entire warranty period has been satisfactory.

Resolution Service Level Agreement (SLA) during warranty: The reported issue will be classified as High / Medium / Low by IMD.

- High level issue (complete breakdown of the system functionality including hardware, software and application etc failure): to be attended and resolved within 04 working hours from the time of reporting.
- Medium level issue (Website is partially functional with degraded performance/ non-functionality of some applications, redundant machine/ software etc failure): to be attended and resolved within 24 hours from the time of reporting.
- Low level issue (website is fully functional but there may be hardware / software/ application failure on redundant machine): to be attended and resolved within 48 hours from the time of reporting.

Service Window

The Service Window for onsite warranty support at IMD is required as under: -

Location	Days	Service Timings	Mode of Delivery
IMD	Monday to Sunday	1000 to 1800 hrs	Resident Engineer

The vendor has to provide the services to resolve critical problems hampering the website operation beyond office hours also.

Chapter 8

TERMS AND CONDITIONS

8.1 The delivery of server, desktop, software, GIS software, application software, and other related items shall be made by the bidder within 6 weeks from the date of issue of the purchase order by Purchaser to the bidder. S/W development for design, development and acceptance of the new dynamic cum CMS cum GIS based website of IMD in Hindi and English, the delivery period shall be 30 weeks from the date of issue of the purchase order by Purchaser to the bidder. Items shall be delivered on site.

8.2 All the items to be supplied should be new (original), of good quality and standard brand/ make and as per the technical specifications mentioned in tender document.

8.3 The bidder will provide operational manuals, OEM documents for peripherals, set of diagnostics to test all the systems/sub-systems etc. along with the servers, software, and other related items. All the software should be supplied along with the media, manuals and requisite licenses for entire lifetime.

8.4 Selected bidder has to handover the complete dynamic cum CMS cum GIS based website application in Hindi and English, Patches & Releases (If any), All content used in the Designing of the dynamic cum CMS cum GIS Website, along with Technical Documents, user Manual, functional Manual, installation guide and any other, if required, for creation of production environment and hosting, launching of the new Website site to IMD for the purpose of copyright and intellectual properties.

8.5 The installation of all the items at IMD, New Delhi will have to be completed satisfactorily within one year from the date of issue of the purchase order, failing which the LD clause shall be applicable.

8.6 The vendor should be ready to accommodate the marginal changes in the requirement which are necessary for the implementation, as which may arise during the intervening period between this document and commissioning of the projects.

8.7 Pricing: Pricing per unit items/work may be quoted in Indian rupees along with make and model of the item. However, all the charges shall be paid as per actual installation.

8.8 After three years period of standard onsite warranty, the mode of payment for AMC, if approved will be half yearly and it will be made after end of each half year on the basis of satisfactory performance certificate from user.

8.9 The vendor shall provide all testing equipments and detailed drawing / cabling layout/ testing/ checkout procedures etc for maintenance of the proposed website.

8.14 All the materials other than described in the list of deliverables should also be quoted to complete the SOW (Scope Of work) as per the tender terms and conditions. The quantity of items is suggestive; however the quantity may vary as per actual requirement.

8.15 The Vendor must submit item wise compliance statement for each Para/sub-para of the entire RFP Documents in hard as well as soft copy.

8.16 The Vendor must submit un-priced bill of materials for all items in hard as well as soft copy also.

8.17 While replacing/repairing any item during warranty period, the parts/item should be of the same brand or genuine equivalent/higher brand.

The company has to give an undertaking that it will not use IMD data for any commercial purpose.

✓ The company should stock sufficient spares at site to avoid undue delay in fault rectification for want of spares.

✓ The company should submit a list of such spares, which it is going to stock along with the proposal.

8.21 The company should maintain regular backups of all the software (O.S. and Application software etc) on a media in addition to automatic scheduled backup system. The firm is also required to restore the existing Software from the Backups whenever required. The company has to demonstrate such backup and restoration from media during acceptance test.

8.22 The firm should be registered with Service Tax Department and should submit a copy of Service Tax Registration Number.

8.23 The firm should submit valid ISO 9001:2008 certification.

8.24 The Director General of Meteorology also reserves the right to accept or reject any or all the bids without assigning any reason.

8.25 Vendors are required to quote in format as per list of deliverables.

8.26 In technical bid, unpriced bill of materials as per list of deliverables shall be submitted.

8.27 Arbitration:-

1 All disputes, differences arising under or pursuant to this agreement shall be referred to the arbitrator to be appointed by the Director General of Meteorology, India Meteorological Department, Lodi Road, New Delhi-110003. Such arbitration shall be housed in New Delhi and shall be subject to and governed by the Rules there under and any amendments/statutory modifications made thereof for the time being in force.

2 The award of the arbitrator shall be conclusive, final and binding on the parties thereto. It shall be no objection that the arbitrator is a govt. servant and that he has to deal with the matters to whom the warranty relates or that in course of his duties as govt. servant, he has expressed views on all or any matters in dispute or difference.

8.28 Trial Run, Acceptance Test and Commissioning:

After the complete execution of the turnkey project it will be under trial run for minimum one month for its functionality and acceptance. Vendor need to qualify all the points as per acceptance procedures. For the purpose, the vendor shall submit SAT document well in advance for approval of DDGM (ISSD).Based on the performance reports, DDGM (ISSD) will recommend for declaring the acceptance.

8.29 Validity

The tenders submitted shall remain valid for acceptance for a period of 180 days from the date of opening of the tender.

The Department reserves the right to request the consent of tenderer for an extension to the period of validity. The request and response there shall be made in writing. The tenderer may refuse the request without forfeiting his EMD. A tenderer accepting the request and granting extension will not be permitted to modify his tender.

8.30 Pre- bid meeting:

Any clarification may be discussed and clarified during the pre-bid meeting which will be held in the Conference hall,ISS Division(IInd floor), Mausam Bhawan, Lodi Road, New Delhi-3 on.....

Chapter 9

PENALTY CLAUSE DURING WARRANTY

- 9.1** If there is complete failure of website operations for more than four hours due to failure of hardware/software/associated equipment/ interconnecting links etc then the warranty period will be extended for 4 days.
- 9.2** If there is complete failure of website operations for more than 24 hour and up to 48 hours due to failure of hardware/software/ associated equipment/ interconnecting links etc then the warranty period will be extended for 7 days.
- 9.3** If the complete failure duration extended beyond 2days and the firm is unable to repair it then IMD is free to get it repaired from any alternate source and cost of its repair will be recovered from the tenderer. Additionally, the period will be extended for 15 days and its multiple for every two days' failure duration or part of it.
- 9.4** If the above failure duration extended beyond 7days, the warranty period will be extended by three times the number of days of failure and shall be counted from 8th day, in addition to the period mentioned at S. No. 9.3 above.
- 9.5** If Website is partially functional with degraded performance/ non-functionality of some applications, redundant machine/ software etc failure then it is to be attended and resolved within 24 hours from the time of reporting, failing which the warranty period will be extended by 4 days.
- 9.6** If website is fully functional but there may be hardware / software/ application failure on redundant machine/peripheral etc then it is to be attended and resolved within 48 hours from the time of reporting, failing which the warranty period will be extended for 7days and its multiple for every two days' failure duration or part of it.
- 9.7** For the purpose of penalty clause implementation, the time of failure period for repair will be counted from the time of reporting of fault during working days (all the seven days of week from 10 AM to 6 PM) and it will be counted from 2hours after reporting the fault beyond office hours /gazetted holiday.

Chapter 10

LIST OF DELIVERABLES

S.N (1)	Name of Item/Store (2)	Ref. Para (3)	Make & model (4)	Quantity (5)
1.	Hardware			
1.1	Rack Mount Server (with make /model etc) & necessary software	4.2.2.1		4
1.2	Desktop work station for GIS Server (with make /model etc) & necessary software	4.2.2.2		2
1.3	KVM Switch Server (with make /model etc)	4.2.2.3		1
1.4	KVM Console Server (with make /model etc)	4.2.2.4		1
1.5	Storage Area Network (SAN) Server (with make /model etc)	4.2.2.5		1
1.6	Server Rack (with make /model etc)	4.2.2.6		1
2.	Software			
2.1	ArcGIS software for Desktop	4.2.1.1 (A to D)		2
2.2	Server Based ArcGIS Software	4.2.1.2 (A to E) & 4.2.1.3		4
2.3	Database Server software(Oracle)	4.2.1.4, 4.2.1.5 , 4.2.1.6		8
2.4	Operating System for servers with media for each server	4.2.2.1		4 licenses
2.5	Operating System for Desktop with media for each Desktop	4.2.2.2		2 licenses

3.	Designing and Development of a dynamic, CMS, GIS based IMD central website (in English and Hindi) as per scope of work.	As per RFP Document		1 Job work
4.1	Normal Onsite Warranty for 3 years with technical support 1 st year 2 nd year 3 rd year	As per RFP Document		1 job work
4.2	AMC : 2 years comprehensive AMC with technical support 1 st year 2 nd year	(optional but to be quoted)		1 Job work
5.	Charges for 3rd Party Security Auditing of IMD website (English & Hindi version) from CERT-in empanelled agency under Ministry of IT, Govt. of India	As per RFP Document		1 Job work
6.	Training	Chapter3 (Para 22)		1 Job work
7.	Miscellaneous, if any	To meet the SOW		1 Job Work, if applicable

Note: a. The list of deliverables is suggestive. However, the vendor can offer their own list of deliverables along with make, model, details of product to meet the project requirements as per the document with proper justifications.

b. For all the hardware items, product manufacturing date, year along with its warranty card etc from the manufacturer should be enclosed with Technical bid. The bidder must ensure that all the items are new and are not end of sale/ end of life/ end of support.

Annexure- 'A'

GIS BASED CENTRAL IMD WEBSITE - EXPECTED LAYERS & ATTRIBUTES

Division	Base Datasets / Layers	Attributes(Data to be plotted)	Cycles	No. of Data Layers
Hydromet	Country and neighbouring Boundaries	DRMS Raingauge Network, RF and Isohyetal Map	Daily	2
	District Boundaries	(District RF, Normals), SPI	Daily, Weekly, Monthly, Seasonal, Annual	5
	Taluka/Tehsil Boundaries	(Taluka RF, Normals)	Daily, Weekly, Monthly, Seasonal, Annual	5
	State Boundaries	Basin Network & RF, QPFs(3*2(WRF,MME))	Daily	7
	Met. Subdivision Boundaries	Network & RF for Short Duration (9 layers per day)	1 Hr, 3 Hr, 6 Hr, 9 Hr, 12 Hr, 15 Hr, 18 Hr, 21 Hr, 24 Hr	9
	River Basin Boundaries	Network for Normal RF, Station Normals & Isohyetal Analysis	Daily	2
SATMET	State boundaries, Country and neighbouring Boundaries	Outgoing Long Wave Radiation (OLR)	Half Hrly, Daily, Weekly, Monthly, Seasonal	5
		Quantitative Precipitation Estimates (QPE)	Half Hrly, Daily, Weekly, Monthly, Seasonal	5
		Precipitation Estimates(IMSRA)	Half Hrly, Daily, Weekly, Monthly, Seasonal	5
		Hydro-Estimator(HE)	Half Hrly, Daily, Weekly, Monthly, Seasonal	5
		Sea Surface Temperature (SST)	Half Hrly, Daily, Weekly	3
		Land Surface Temperature(LST)	Half Hrly, Daily, Weekly, Monthly	4

		Insolation	Half Hrly, Daily, Weekly	3
		Upper Tropospheric Humidity (UTH)	Half Hrly, Daily, Weekly	3
		Cloud Top Temperature (CTT) Image, Change(2), Below-40 Deg.(2)	Daily	5
		Atmospheric Wind Vector (AWV)	VISW, CMV, WWV, LLW, HLW	5
		Aerosol Optical Depth (AOD)	Daily	1
		Fog, fire, smoke	Half Hrly	3
		Snow,	Daily, Weekly, Monthly, Seasonal	4
		Normalised Vegetation Index NDVI)	Daily	1
		T Phi gram of Temperature and Humidity profile data along with different indices over the Indian regions by using sounder data in HDF-5	Hourly	3
		Total/Layer Precipitable Water Vapour	TWV,LWV,MWV,HWV on hourly basis	4
		Total Ozone	Daily, Monthly	2
		K-Index, Lifted Index, Total Totals, Wind Index, Dry Microburst Index (indices)	Hourly	3
		Mean Surface Pressure, Potential Temperature Difference (PTD)	Hourly	2
		K-Index, Lifted Index, Total Totals (indices)	Daily	3
Agromet	Country and neighbouring Boundaries	Aridity Anomaly Map	Weekly	1
Seismo	Country and neighbouring Boundaries	Seismic Network	As per requirement	1
	Country - Physical boundaries	Tectonic/geological		1
	District Boundaries	Seismic zoning		1
		Earthquake events		1
		Expected Intensity Countours		1
		Likely Impacts/Effects		1
Microzonation	City specific	Microzonation products layers	As per requirement	15
NWP	Country and neighbouring Boundaries	City based Nowcast, Network Map		1
	District Boundaries	Local forecast, Local Network	24 Hrly., 48 Hrly.	2
	River catchments	Maximum Temp.		1
	Highways	Minimum Temp.		1
		AWS Network, Temp., Rainfall, Pressure, Wind Speed, Direction Ctrs	Hourly, Layers to be replaced	5
		ARG Network, Rainfall	Hourly, Layer to be replaced	1
RADAR	Country and neighbouring Boundaries	Network Map		1
		PCAPPI		1
		Plan Position Indicator Z (PPIZ)		1
		Surface Rainfall Intensity (SRI)		1
		Max Z		1
		Volume Velocity Processing		1
		Winds		1
Met. Data	Country and neighbouring Boundaries	Network, Wind Speed & Direction, Temp., SST, Pressure, Visibility, Humidity, RF		7

		Warning		1
Other	Demographic dataset	Population		1
	Socio-economic datasets	Schools		1
		Streets		1
		Hospitals		1
		Shelters		1
			Total Data Layers	152
			Total Base Layers	8
			Total No. of Layers	160

There ought to be a provision of inclusion of additional a few layers without any additional cost while development besides the above mentioned number of GIS layers.

To be added under scope of work, there must be a provision of access of the website by general public and some products restricted for registered users.

Annexure- B

General Information

1	Name of the Company/ Bidder/ SI/ OEM	
2(a)	Full address of Company/ Bidder Along with : Name of the Bidder/Company/Firm: Year of establishment: Constitution: Address of Corporate Office: Core Business: Other business: Contact Person Telephone no. Fax no. E-mail address: Website URL:	
2(b)	Web Services: a. Year of starting web development b. Year of starting web GIS development c. Core competence in (i) Web hosting and maintenance (ii) Database/content management (iii) Web designing (iv) Web and Web GIS applications (v) SMS Gateway integration	
3	Local address of company /Bidder for communication, if any	
4(a)	Are you a manufacturer or dealer or SI in the areas of website development or software or GIS software supplier	
4(b)	If Company/Product/Services is ISO/CMM certified (copies of certificates be attached)	Enclosure No:
5(a)	Annual turnover in last 3 financial years (in Rs... Crores). (Supporting documents to be attached.) (i) Year 2010-2011 (ii) Year 2011-2012 (iii) Year 2012-2013	(i) (ii) (iii)
5(b)	The bidder should have at least 5 years experience as on 31 st March, 2013 in webs	

	<p>site creation /development (static, dynamic, CMS,GIS), maintenance & other related matters as given below:</p> <p>i. The bidder/ SI should have experts/ professionals in the field GIS, CMS, dynamic aspects in application development, implementation, operation, maintenance and support service. Evidence to be provided in the form of work order supported by customer certificate or and job completion certificate.</p> <p>ii. The concerned bidder must have developed minimum two portals/websites of similar nature with static, dynamic, CMS and GIS contents during the last five financial years, out of which 1 such portals/websites must be for Ministries/Departments of Central Governments/ Central PSU/State Govt. The executive summary and technical details of the Application should be submitted with the bid. The application developed on Web GIS platforms of ESRI(ArcGIS) will be treated as GIS application. The application developed on online maps APIs like Google Maps API ao Bing Maps API will not be treated as GIS application. The bidder has to furnish necessary documentary evidence in support of this on their letter head, along with supporting documents.</p> <p>iii. Having managed for minimum two years for at least two portals/websites of similar nature as described in above point. Kindly enclose at least three maintenance service support certificates from your customers for whom you have designed and developed dynamic, CMS, GIS based website.;</p> <p>List of Sites developed and managed in last two years</p> <ol style="list-style-type: none"> 1. 2. 3. 4. 5. <p>iv. Technical Details(Hosting Environment Details)</p> <ol style="list-style-type: none"> a. Operating System b. Database c. Application Server d. Scripting Language e. GIS Server f. Supported Browser g. Any plug-in/external DDL required to run the application or part of application at client end 	
5(c)	<p>Supply of Servers, Storage and related items in last 3 financial years in Govt. of India Department(s) / Organization(s) (in Nos. and Cost)</p> <p>(i) Year 20010-2011</p> <p>(ii) Year 2011-2012</p> <p>(iii) Year 2012-2013</p>	
5(d)	<p>Supply of ArcGIS software (desktop and server enterprise version) and related items in last 3 financial years in Govt. of India Department(s) / Organization(s) (in terms of licenses, Nos. , nature of the product, brief description of the project, name/version of the project implemented, details of modules/components successfully implemented, name of the implementer, project duration, customer contact/reference and total Cost)</p> <p>(i) Year 20010-2011</p> <p>(ii) Year 2011-2012</p>	

	(iii) Year 2012-2013	
6(a)	Strength of local office at Delhi (i) No. of Marketing Personnel } (ii) No. of Technical Personnel } (Qualification be also mentioned) (iii) No. of Supporting Staff }	
6(b)	Strength of local office at Delhi (in case of Server, SAN, and desktop support) (i) No. of Marketing Personnel } (ii) No. of Technical Personnel } (Qualification be also mentioned) (iii) No. of Supporting Staff }	
7(a)	Installation base of Servers, desktop, Storage, etc. related items in and around Delhi supplied by Company/ bidder/ OEM/ SI. (Please enclose the list of Purchase Orders)	
7(b)	design, development and maintenance base of a dynamic, CMS, GIS based website in English, Hindi in and around Delhi and rest of India, completed by Company/Bidder in terms of nature of the product, brief description of the project, name/version of the project implemented, details of modules/components successfully implemented, name of the implementer, project duration, customer contact/reference and total Cost) (Please enclose the list of Purchase Orders)	
7 ©	Installation base of ArcGIS software (desktop and server enterprise version) Software(s) in and around Delhi supplied by Company/Bidder	
8.	Kindly enclose at least three “after sales service Support certificates” (during last five years) from your customers where you have supplied and installed Desktop, Servers, Storage, etc.; system Software/ GIS software and/or Networking Equipments to evaluate your service support performance. Total no. of service support certificates enclosed.	
9	Any other information you feel necessary (Separate sheets may be used if required)	