भारतीय उष्णदेशीय मौसम विज्ञान संस्थान
INDIAN INSTITUTE OF TROPICAL METEOROLOGY
(पृथ्वी विज्ञान मंत्रालय, भारत सरकार का एक स्वायत्त संस्थान)
(An autonomous Institute under the Ministry of Earth Sciences, Govt. of India)
पाषाण, पुणे - 411 008
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वैश्विक निविदा सूचना शुद्धिपत्र / CORRIGENDUM TO GLOBAL TENDER NOTICE

निम्नलिखित तालिका में विनिर्दिष्ट समसंख्यक निविदा सूचना द्वारा प्रकाशित विवरण हेतु निविदा प्रस्तुत करने की निर्धारित तारीख को बढ़ाया जा रहा है|

The last date of submission of bids for purchase of "items / description" published vide even number of Tender Notice is extended as tabulated below

क्रम सं. Sr. No.	निविदा सूचना सं. Tender Notice No.	विवरण/Description	ऑनलाइन बोलियाँ प्रस्तुत करने की बढ़ाई गयी समय सीमा / Extended timeline for submission of bids online	
			के पास से From	तक To
01.	पीएस/128/18/2018 PS/128/18/2018	इंटेग्रेटेड रेन मॉनिटरिंग एंड वॉर्मिंग के साथ मुंबई महानगर क्षेत्र में शॉर्ट-रेंज एक्स-बैंड पोलारिमेट्रिक स्कैनिंग डॉपलर मौसम रडार नेटवर्क की आपूर्ति, स्थापना, कमीशन और रखरखाव - मात्रा 04 सेट्स. **Supply, installation, commissioning and maintenance of Short-Range X-Band Polarimetric Scanning Doppler Weather Radar Network in Mumbai Metropolitan Region with an Integrated Rain Monitoring and Warming – Qty.04 Sets.**	14 अगस्त 2019 1500 बजे से / 14th August 2019 1500 hrs.	04 सितंबर 2019 1500 तक 04th September, 2019 1500 hrs.
उपरोक्त निविदा के लिए तकनीकी बोलियाँ **04 सितंबर, 2019** को **1530** बजे खोली जाएंगी। **Technical Bids (only) for aforesaid tender will be opened on 04th September, 2019 at 1530 hrs.**				

दिनांक 18 जुलाई, 2019 को हुई निविदा-पूर्व बैठक का अंतिम कार्यवृत्त भी नीचे विनिर्दिष्ट वेबसाइट पर उपलब्ध है| अन्य निबंधन एवं शर्तें यथावत रहेंगी। विस्तृत विवरण एवं बोलियों के प्रस्तुतीकरण हेतु कृपया वेबसाइट https://moes.euniwizarde.com देखें। संभावित बोलीदाताओं की जानकारी के लिए, निविदा विवरण भी इस संस्थान की वेबसाइट http://www.tropmet.res.in एवं सरकार के सेंट्रल प्रोक्यूरमेंट पोर्टल (सीपीपी) http://www.eprocure.gov.in. पर भी उपलब्ध है। संस्थान किसी भी स्तर पर बिना किसी कारण बताए निविदा को पूरा या आंशिक रद्द करने का अधिकार सुरक्षित रखता है।

Also final minutes of Pre-Bid meeting held on 18th July, 2019 are available on websites as stated below. All other terms & condition shall remain unchanged. For details and submission of bids please visit website https://moes.euniwizarde.com. For the information of the prospective bidders, the tender details are also available on this Institute's Website: http://www.tropmet.res.in and Government's Central Procurement Portal (CPP) http://www.eprocure.gov.in. The Institute reserves the right to cancel the tender at any stage either in full or part as the case may be without assigning any reason thereof.

ह/Sd-
प्रशासनिक अधिकारी, कृते निदेशक
Administrative Officer, for Director
ईमेल/Email :psu.iitm@tropmet.res.in

Indian Institute of Tropical Meteorology, Pune – 411 008

PS/128/18/2018 14th August, 2019

Sub: Minutes of Pre-bid meeting held on 18th July, 2019 for Supply, installation, commissioning and maintenance of Short-Range X-Band Polarimetric Scanning Doppler Weather Radar Network in Mumbai Metropolitan Region with an Integrated Rain Monitoring and Warming – Qty.04 Sets.

The pre-bid meeting for the subject mentioned above held on 18th July, 2019 at 1100 hrs. at IITM, Pune.

In response to our Tender Notice No. PS/128/18/2018, representatives of the following prospective bidders / firms / companies / OEM attended the meeting with their queries.

i) M/s. BEL, Bangalore
ii) M/s. SGS Weather, New Delhi
iii) M/s. WMI SUNAG, LLC, USA
iv) M/s. Astra Microwave Products Limited, Hyderabad
v) M/s. Satcom Technologies, Hyderabad
vi) M/s. Tesscorn Systems India Pvt. Ltd., Bangalore
vii) M/s. Environmental Instrumentation, New Delhi

Email queries received before and during the meeting from below companies were also considered by the Committee.

i) M/s. EEC, USA
ii) M/s. CTech Labs Pvt. Ltd., Mumbai
iii) M/s. Ganpati Computers & Communications, New Delhi
iv) M/s. Mazda Gears (Regd.), New Delhi

The queries received from prospective bidders / firms/ companies / OEM in person and by email were noted and discussed among the Committee members and vendors.

The queries received from all the participating bidders were referred to the Technical Evaluation Committee (TEC) of Radars and Pre-bid Committee. The Committee discussed / deliberated thoroughly and the responses are prepared as per **Annexure-I**.

Meeting ended with thanks to chair.

Annexure-I

Response to Pre-Bid queries to Tender for "Supply, installation, commissioning and maintenance of Short-Range X-Band Polarimetric Scanning Doppler Weather Radar Network in Mumbai Metropolitan Region with an Integrated Rain Monitoring and Warming" Qty-04 Sets (PS/128/18/2018)

M/s. Bharat Electronics Limited (BEL), Bangalore				
Sr. No.	**RFP Ref. No.**	**RFP Description**	**Query**	**Response**
1.	Chapter 5/ 4(b)	The bidder (OEM/Direct Distributor/Dealer) should have supplied and installed during past 5 years, at least TWO X-band Polarimetric Doppler Weather Scanning Radar System as mentioned in Chapter-4. The Bidder should furnish the information on all past supplies and satisfactory performance during past 3 years in the Performance Statement Form (Chapter-8, Annexure D). Bidders shall invariably furnish documentary evidence (Client's certificate) in support of the satisfactory operation of the equipment / system.	M/S BEL designed, developed and supplied 6Nos S and 1 No C band DWRs to IMD & ISRO. Variety of X band radars for armed forces are being supplied and maintained by BEL. Considering the technical capabilities of BEL Requested to change the point as " Vendors should have supplied atleast TWO Polarimetric Doppler Weather Scanning Radar System" and maintained the same till date".	No change, as per tender.
2.	Appendix-1/ 3(a)	The base data that includes Reflectivity, Velocity, Spectrum Width and Dual Polarimetric Parameters (output of radar processor) shall be stored automatically on hard disk or data storage device	Please clarify Is it local hard disk residing on workstation? If yes, what is the duration of storage before deleting old files?	One year data required to be available at each radar site.
3.	Appendix-1/ 5(i)	Setup of data conversion from native format to scientific formats. The setup can be for automatic conversion and also for conversion of desired past data sets. Should be able to convert all base data sets. It should also be possible to convert the derived digital data from base data such as velocity, wind etc. Facility for generating composite data set in NETCDF and HDF5 along with native formats, in near real time also to be provided.	Clarification requested on the native format and scientific formats. Please explain the requirement of composite data set in NETCDF and HDF5 along with native formats. (Is it required to store the composite data also in specified formats?)	Native format– Proprietary format of the supplier. Scientific – Open source format viz CfRadial compliance, NetCDF, HDF5 etc.
4.	Appendix-1/ 5.1(d)	The data of radars that belong to the same area need to be interpolated and merged (user defined resolution) and create a composite (Mosaic) map. Composite data set of reflectivity, rainfall rate, rainfall	Please confirm whether Composite is required to be generated only at Central location OR at each Radar station	Composite can be generated at the central location but should be available as a display at each radar station also for view.

		accumulation, warnings to be provided. Composite data set in NETCDF along with native formats, in near real time also to be provided		
5.	Appendix-1/ 5.3.2 (a)	Rainfall intensity (R) estimation (instantaneous and over a user defined period) using polarimetric moments (R-KDP, R-Z-ZDR) and Z-R method for a given height above the ground. There shall be provision to modify the rain-rate estimation equations.	Whether provision shell be allowed to modify the co-efficient of Rain rate estimation equations. If not please elaborate the requirement.	Dynamically adaptable relationship and coefficients are required.
6.	Appendix-1/ 15(c)	All the radars to be installed and commissioned in the form of network within 7 months from the date of clearance of critical design review	Considering the design and manufacturing activities for the realization of the Radar, Requested to change the point as " All the radars to be installed and commissioned in the form of network within 12 months from the date of clearance of critical design review"	No change as per tender.
7.	Appendix-1/ Table 1/Control and monitoring software	Computer system for remotely controlling and monitoring the network of 4 radars, status of radar and for controlling the operational parameters of radar. Synchronized operation and control of all the 4 radars from a remote site.	Please provide the hardware requirements for Remote control and monitoring facility.	As per tender, IITM anticipate user friendly GUI driven ware for controlling the radar remotely.
8	Appendix-1/ Table 1/Computer Peripherals	Control Workstation at each Radar Sites : Quantity 4	Please clarify whether each radar site should have control work station : 4 Nos.	Control workstations are required at each of the radar site is 1 as well as at the central location, hence total control workstations are 5 Nos.
9	Appendix-1/ Table 1/Computer Peripherals	Standby Workstation for the radar control : Quantity -1	Please clarify whether One standby workstation for IITM as a whole OR one workstation per Radar site?	Yes, only one standby workstation is required for the radar control at the central location.
10	Appendix-1/ Table 1/Computer Peripherals	Network attached storage : Quantity 1	Please clarify whether NAS required only at the Control centre? In the list of deliverables the quantity of NAS is specified as 4	Total 5 NAS system will be required; one each at four radar sites and one at central location.
11	Appendix-1/ Table 1/Computer Peripherals	Display Workstation at IITM central location : Quantity -4 Separate Display Workstation required in IITM for each Radar Sites for Product generation and display of the data. This Display Workstation required to be connected to Control Work Station and will also transfer the	Please confirm Where do these 4 workstations resides?	For each radar site, one display workstation is required. Total 4 display workstation is required. These Display Workstations required to be connected to Control Work Station and will also transfer the Data at

		Data at IITM server.		IITM server.
12	Appendix-1/ Table 1/Computer Peripherals	Laptop : Quantity 2 A portable computer (laptop) of latest version/ configuration such as Macbook Pro-13-inch with minimum specification of 3.1 GHz Intel Core i-5 processor, storage	Please confirm whether 2 laptops per radar site is required and purpose of the laptop?	Total two laptops only are required. This will be used for standby purpose at one of the radar sites and central location.
13	Appendix-1/ Table 1/power Requirements (2) Online UPS	UPS at radar site : Quantity 4 Suitable capacity to operate the whole radar system and control workstation for at least 18 hrs power back. Catering to required voltage stabilization with a power factor suitable for the system. Vendor need to provide Power budget Calculation. UPS at Central location: Quantity -1 Suitable capacity to run the whole computers, server and display workstation for at least 9 hrs power back. Catering to required voltage stabilization with a power factor suitable for the system. Vendor need to provide Power budget Calculation	Please clarify Whether UPS at Radar site :Quantity 4 indicates as 1 unit per radar ?. Number of Batteries for 18 hrs and 9 hrs power backup requirement will be high and maintenance of batteries will be complex. Please clarify whether suitable diesel generator can be supplied and 30 mins battery backup can be provided.	UPS at radar site: Power backup for at least 6 hrs required. UPS at central location: Power backup for at least 1 hr required. As per the tender document, the DG set is not required.

M/s. SGS Weather & Environmental Systems Pvt Ltd

Sr. No.	**RFP Ref. No.**	**RFP Description**	**Query**	**Response**
1.	General 1, Table-1, Transmitter, point-2	Transmitter, point (2) : Frequency Range: 9.35 GHz – 9.6 GHz, please specify the central frequency of each pulses and overall operational bandwidth requirement. [not exceeding 20MHz]	Please confirm that frequency clearance will be provided by IITM. The frequency allocation is necessary in order to factory tunning the Radar and delivery is linked with allocation of frequency. Please also confirm that during critical design review, frequency allocation and site clearance will be provided?	Yes, frequency clearance will be provided by IITM. Frequency allocation: No change, as per tender. It is noted that operation of the radar with frequency of short and long pulse should be within the frequency band mentioned. IITM will inform frequency allocation and site clearance during critical design review.
2.	General 1, Table-1, Application Software	Data integration with rain gauges, disdrometer and correction of derived rainfall with rain gauge data	For demonstration of the described features, we require the data distribution method along with rain gauge and disdrometer data. Kindly confirm the date for	Disdrometer and Rain Gauge data will be provided by IITM. The supplied system should have the features as described in Page-76:

			demonstration will be provided by the IITM.	Appendix-1, Table-1 in Software section -Application Software
3.	General 1, Table-1, Test Equipment's	SPARES, TOOLS, AND TEST EQUIPMENTS	We would like to suggest the Diode detector to the test equipment list, in order to measure pulse width of the RF frequency modulated transmission pulse. The proposed model No. is followings: Diode Detector Keysight 423B or equivalent Frequency Range 10MHz – 12.4GHz	As per the tender document in Page 78, Appendix-1, Table-1 in Spares, tools and Test Equipment's, Point C: The manufacturer shall also include any other recommended spares / test equipment's identified as critical item.
M/s. Enterprise Electronics Corporation, USA				
Sr. No.	**RFP Ref. No.**	**RFP Description**	**Query**	**Response**
1.	Section 5.1-Base Products Table 1 General item-3	Second-trip echo removal necessary	Second trip echoes removal should be removed from the tender.	No change, as per tender.
2.	Table 1-Software, item 1	Data integration with rain gauges, disdrometer and correction of derived rainfall with rain gauge data.	Correction of radar derived rainfall with rain gauge should be removed from this tender.	No change, as per tender.
M/s. WMI SUNAG LLC, USA				
Sr. No.	**RFP Ref. No.**	**RFP Description**	**Query**	**Response**
1	----	-----	No quires received on tender document. But the representative inform the additional features of their system	No remarks.
M/s. Astra Microwave Components Limited, Hyderabad				
Sr. No.	**RFP Ref. No.**	**RFP Description**	**Query**	**Response**
1.	Appendix-1, item 5 Product Generation l.	Set up of data conversion from native format to scientific format.	Please specify the definition of "native" and scientific formats. Clause 5 (L)	Native format-Proprietary format of the supplier. Scientific – Open source format viz CfRadial compliance NetCDF, HDF5 etc.
2.	Appendix-1, item 10 Testing and Acceptance	FAT shall be carried out at supplier premises prior to shipment.	Can the FAT be conducted in India at the Bidder's facility or at OEM facility. We (Bidder) have all the testing facilities in India.	FAT will be done at the OEM factory.
3.	Appendix-1,	Sun calibration	Will the IITM provide Solar	Solar flux (Sun) values

	Table-1, Calibration		flux (Sun) Values.	are readily available in Astronomical centres/websites.
4.	Appendix-1, Table-1, 4. Data format	Data format	Data formats: System should be capable of generating radar base data and products in NETCDF format. Is it only in CFRadial or any other formats. If any other formats, please specify.	Yes, system should be capable of generating radar base data and products in CfRadial compliance NetCDF, HDF5 etc.
5.	---	---	We are the leading manufacturer of RF & Microwave Systems and indigenized complete RF Products of X-band Radar except the signal processor and software. We are supplying indigenized X Band Radar system with imported Signal Processor & Radar Software to IMD. Can we offer similar system to IITM complying to all the tender specifications. Pl confirm your acceptance.	Suppliers/Firms/Bidders can submit their bids if all the technical specifications and other conditions of the tender are met.
M/s. Tesscorn Systems India Pvt Ltd., Bangalore				
Sr. No.	**RFP Ref. No.**	**RFP Description**	**Query**	**Response**
1	APPENDIX No. 1, Page 68 of 82	e. Automatic Calibration Solar, Receiver, Dynamic Range	EWR could deliver a system with this function; however it will increase the pricing of the system and the AUTOMATIC Calibration function is considered a luxury feature. As indicated, the systems could be delivered with this automatic function, it is expensive and in similar applications not necessary. We request this requirement be removed and replaced with On-Site Calibration (By OEM or their Authorized Indian Representative). However it is not a procedure that needs to happen often for continuous reliable operation of the systems. In fact, the procedure's purpose is mostly preventative - when done on a regularly scheduled pro-active basis. For example, many	No change, as per tender.

			customers require EWR to perform similar type, system calibration, every 18 months. Many do it even less often. We will include the feature if it remains a requirement.	
2	GENERAL items m) Page 67 of 82	Delivery of radar at the site shall be the responsibility of vendor.	Delivery - We are required to quote FCA/ FOB (USA) and CIF/CIP Mumbai prices. Delivery of the system to the sites will be IITM's responsibility. Kindly clarify.	The bidder has to quote on INCOTERM Delivered Duty Paid (DDP) basis in case of import supplies quoted in foreign currency (i.e. USD) and INCOTERM Free On Road (FOR)-Destination basis in case of INR quote. The bidders are also required to provide the details of FOB/FCA/CIP/CIF prices and packing & forwarding, insurance and other related clearance charges in the prescribed format given in the tender.
M/s. Furuno Electric Co. Ltd., Japan, CTech Labs Pvt Ltd				
Sr. No.	**RFP Ref. No.**	**RFP Description**	**Query**	**Response**
1	APPENDIX No.-1. 1c	Configuration of the four radars shall be set for synchronous operation.	Meaning of the word "synchronous"	The radars are to be operated in unison, in time.
2	APPENDIX No.-1. 1f	The quoted radar signal processors and its data analysis software for the System should be in use in any operational weather services/urban weather radar network in the world. It shall meet the functional requirements of the network along with the data products required to be generated, displayed, and archived, which have been specified elsewhere in detail.	Meaning of this term. Do we have to provide international exchange format? If so, what is it?	IITM wants a proven technology in place. Thus the used signal processor and software should be in use in any operational weather services/urban weather radar network in the world, and nothing to do with international exchange format.
3	APPENDIX No.-1. 1h	Horizontal maps of reflectivity, and radial velocity at different vertical levels (CAPPI) and surface rain rate to be generated and displayed through the GIS platform. Such maps shall also be available through radar MOSIAC/COMPOSITE configurations wherein data from multiple radars will be	IRIS is necessary to provide this function. Meaning of the word "GIS". Is it enough to overlay on map?	IITM doesn't endorse any specific firm software. A world map server (WMS) displaying the data on server is required.

		merged digitally and displayed on GIS.		
4	APPENDIX No.-1. 5.c	The System should be having required menu driven software with GUI controls for: c) Setup of communication channels.	Meaning of the sentence "Communication channels". It means communication line of radar and its controller, not a problem.	It means setup of various communication channels for transmission of data from radar system at site to any other place using tcp/ip using internet etc.
5	APPENDIX No.-1. 5.e	Automatic calibration for solar, receiver, dynamic range.	Detailed requirement of this Solar: Measure and correct azimuth and elevation error. Receiver: not implemented Dynamic range: measure noise floor and adjust threshold	No change, as per tender. All cited calibrations in tender are required.
6	APPENDIX No.-1. 3.4	Warning and Forecasting Products. a. System shall generate and display warning symbols for thunderstorm and hail storm, The forecast of probable places of likely hood, their track, etc using a reliable algorithm. b. System shall be capable of evaluating speed and direction of movement of weather systems. c. System shall also be capable of warning if any of the conditions defined by the user are reached or fulfilled on reflectivity, velocity, VIL, rainfall intensity, rainfall accumulation and wind shear. d. Heavy rainfall warning with text output message (via SMS/email) to registered users	IRIS is necessary to provide this function. d. is not implemented in IRIS. Could you remove the sentence "d. Heavy rainfall warning with text output message (via SMS/email) to registered users"?	No change, as per tender.
7	APPENDIX No.-1. 8.f	Aviation warning indicator lamps shall be supplied and installed by the vendor on the top of the antenna/radome at appropriate height.	It is necessary for all of four sites? Actually, not able to mount on radome surface due to performance reason.	Aviation warning lamp is a requirement. And it can also be accommodated at the close vicinity.
8	APPENDIX No.-1. 14	c. Interface connectivity document has to be provided for hardware as well as software interfaces. f. Layout and Schematic Assembly Drawings: Schematic Diagrams of all assemblies, modules shall be provided. g. Algorithm of Products: The algorithms used in product generation shall be supplied.	Please remove c, f and g. We can't disclose these type of secret information.	IITM requirements are to day to day operational needs. The provided details by the supplier will be preserved for internal use only. Non-disclosure agreement can be signed between IITM and the Manufacturer of radar.
9	Table-1 GENERAL 5	Detection capability of 20 dBZ at 60 km, to be consistent with 75 m range resolution.	Could you change it to 27 dBZ at 60 km, to be consistent with 75m range	No change as per tender.

		Equivalent Scaled Minimum detection capability throughout the range of observation (150m to 60km) has to be demonstrated with calculations. Detailed analysis/references must be provided to support the detection capability.	resolution or 23 dBZ at 40 km to be consistent with 75m range resolution? This sensitivity is not able to realize not only our small size radar but also required maximum size of 1.25m antenna.	
10	Table-1 TRANSMITTER 3	Should meet detection capability of 20 dBZ at 60 km, as per Point No. 5 in GENERAL .	Could you change as follows: Should meet detection capability of 27 dBZ at 60 km, as per point number 5 in General	No change as per tender.
11	Table-1 ANTENNA AND RADOME 1	Prime focus parabolic antenna, please specify configuration; Diameter 1.25 m or less (to keep the System compact)	Could you change "Prime focus parabolic antenna" to "Parabolic antenna". The former restricted definition cuts off Cassegrain or Gregorian antennas but it is not fruitful, there is no technical advantage.	Accepted. Tender document amended as Parabolic antenna which caters for all the form of feed solution.
12	Table-1 ANTENNA AND RADOME 2	-23 dB or better. Subsequent side lobe levels need to be better than -23 dB. Antenna pattern and related calculation must be provided.	Could you change it to "-17dB" or better? This is not feasible level even for 1.25m antenna.	No change as per tender.
13	Table-1 ANTENNA AND RADOME 5	360° and 0-6 rpm	Could you change it to 360^0 and 0.5-6 rpm? 0.5-6 rpm full cover capability is not necessary for operational radar and will be a factor to size up.	No change as per tender.
14	Table-1 ANTENNA AND RADOME 9	Provision for automatic changeover between different scan strategies (PPI, RHI, Volume, Point mode, Sector, Sector blanking, and Manual).	Could you remove "Point mode"? it is not necessary for operational radar.	No change, as per tender. Certain occasions inclusive of SUN-CAL pointing mode becomes a necessity.
15	Table-1 ANTENNA AND RADOME 12	Lightening rod with dual ground wires. All four Radar Sites should be provided with Active Lighting arrestor with 75 meter protection radius.	You know actual solution of this. We couldn't found.	Lightening rod with dual ground wires is a proven technology.
16	Table-1 CALIBRATION, DISPLAY AND DATA FORMAT 2.	Sun calibration in both software driven and manual mode operation for pointing accuracy 1º. The system shall be made to point towards sun for establishing the pointing accuracy of the antenna; stability and reliability of receiver chain using solar flux (sun) values known from other sources.	Could you remove sentence "Stability and reliability of receiver chain using solar flux (Sun) values known from other sources"? This is not feasible actually, not able to evaluate high stability and reliability but require very high cost, so better to remove.	Sun calibration is for pointing accuracy. Requirement of receiver calibration is now removed in the amended tender.
17	Table - 1 RECEIVER 3	Linear dynamic range : 90 dB or higher	Could you change it to 60 dB or higher? It is not suit to compact system, 90 dB is not feasible even if use 16	No change as per tender.

			bit ADC. Additionally, this requirement will be degraded for small size radar due to antenna size difference.	
18	Table - 1 SOFTWARE 1.	Using volume scan data, standard Met products such as PPI, RHI, CAPPI, Echo top, HMAX, VAD, VVP. Rainfall intensity by Z-R & Dual pol. method, Hydrometeor Classification, Support of single and multiple radar network, data correction (like rain attenuation, beam blockage, Doppler velocity de-aliasing etc), data integration with rain gauges, disdrometer and correction of derived rainfall with rain gauge data. Detailed documentation and references on these weather products and algorithms used is mandatory. Exact methodology implemented for rain attenuation correction should be described and supported by dataset/images with and without implementation of rain attenuation correction. Clear demonstration is mandatory. Details on Software support for rain rate computation from radar must be provided. Clear demonstration is mandatory. Hydrometeor classification product should be supported by datasets/images and references. Clear demonstration is mandatory.	IRIS is necessary to provide this function. Could you remove sentence "Detailed documentation and references on these weather products and algorithms used is mandatory? This type of information is secret and key technology, so not able to disclose as manufacturer. The sentence "clear demonstration how to be defined or remove"? We can't judge, fulfil the required level or not.	IITM requirements are to day to day operational needs. The provided details by the supplier will be preserved for internal use only. Non-disclosure agreement can be signed between IITM and the Manufacturer of radar

Annexure-II

Amendments made to Tender for Supply, installation, commissioning and maintenance of Short-Range X-Band Polarimetric Scanning Doppler Weather Radar Network in Mumbai Metropolitan Region with an Integrated Rain Monitoring and Warming Qty-04 Sets (PS/128/18/2018)

Owing to the prevailing technology, market availability and based on the pre-bid requests & survey, the following amendments to the X-band Radar Tender (vide PS/128/18/2018) are made by the committee. Note that the other terms and conditions of the Tender would remain same.

Page 43, CHAPTER-6

FORMAT FOR DELIVERABLES FOR SUPPLY, INSTALLATION, COMMISSIONING & MAINTENANCE OF 04 Nos. SHORT-RANGE X-BAND DUAL POL. DOPPLER WEATHER RADARS

Sl.No	Items	Qty.	Cost Per Unit		Applicable Duties & Taxes	Total cost
			In foreign currency	In INR		
1.6	Workstations for radar control (including one standby)	5 Nos				
1.7	Work Stations for display	4 Nos				
1.8	Workstations for MOSAIC	1 Nos				
1.10	Radar Application and Operating Software	5 Nos				
2	Laptop	2 Nos				
6	Storage /Archival	5 Nos				

Page 75, APPENDIX-1, TABLE-1, ANTENNA AND RADOME

1. Antenna: Parabolic antenna, please specify configuration; Diameter 1.25 m or less (to keep the System compact).

Page 76, APPENDIX-1, TABLE-1, CALIBRATION, DISPLAY AND DATA FORMAT

2. Sun Calibration: Sun calibration in both software driven and manual mode operation for pointing accuracy 1º. The system shall be made to point towards sun for establishing the pointing accuracy of the antenna.

PAGE 77, APPENDIX-1, TABLE-1, RADAR WORKSTATION

1. Computer Peripherals: Network attached storage: Quantity 5

1) RAID controller.
2) 5 hard disks with 4 TB of capacity, on RAID 5.
3) Redundant power supply.

(f) Laptop: Quantity 2

Two portable computers (laptop) of latest version/ configuration capable of radar operations.

PAGE 78, APPENDIX-1, TABLE-1, POWER REQUIREMENTS

2. Online UPS: UPS at radar site: Quantity -4

Each radar site will have only one UPS. Suitable capacity to operate the whole radar system and control workstation for at least 6 hrs power back. Catering to required voltage stabilization with a power factor suitable for the system. Vendor need to provide Power budget calculation.

UPS at Central location: Quantity -1

Suitable capacity to run the whole computers, server and display workstation for at least 1 hrs power back. Catering to required voltage stabilization with a power factor suitable for the system**.** Vendor need to provide Power budget calculation.