

**Minutes of Pre-bid meeting held on 05.02.2024 for the  
“Procurement of 08 Nos. of SSPA based C-Band DWRs”**

India Meteorological Department (IMD) has issued the tender through GeM portal vide GeM Bid No: GEM/2024/B/4476918 dated: 25.01.2024 for procurement of 08 numbers of SSPA based C-Band DWRs. The competent authority constituted a Pre-Bid Committee vide DGM-24017(16)/1/2022-UAID dated: 23.10.2023 for conducting Pre-Bid meeting to provide the clarifications to the likely suppliers as per provisions of the tender, consisting of following members:

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|---|------------------|
| 1. Dr. V. K. Anandan, Scientist 'G', ISTRAC Bengaluru | Chairman         |
| 2. Dr. G. Pandithurai, Scientist 'G', IITM Pune       | Member           |
| 3. Director (Finance), IFD, MoES                      | Member           |
| 4. Sh. Gajendra Kumar, Scientist 'F' & Head UAID, IMD | Member           |
| 5. Dr. R. K. Giri, Scientist 'F' & Head, CPU, IMD     | Member           |
| 6. Sh. B. A. M. Kannan, Scientist 'F', IMD            | Member           |
| 7. Sh. Rangaraj AG, Scientist 'E', IMD                | Member           |
| 8. Sh. Rohit Shukla, Scientist 'D', IMD               | Member Secretary |

The Pre-Bid meeting was conducted as per schedule on 05.02.2024 at 1100 hours IST in hybrid mode i.e., in the Conference Room at Floor 6 of Mausam Bhawan, IMD, New Delhi through physical mode and online mode through VC. Dr. G. Pandithurai, Scientist 'G', IITM Pune and Sh. Rangaraj AG, Scientist 'E', IMD could not attend the meeting due to preoccupations. The bidders from the following firms attended the meeting:

S.No.	Name of participating firm	Mode of attendance
1.	M/s Astra Microwave Products Limited	Physical
2.	M/s Bharat Electronics Limited	Physical & Online
3.	M/s Data Patterns (India) Private Limited	Physical

The Pre Bid queries from SGS were received in hard copies and the queries from M/s. BEL were received through e-mail.

The Committee discussed and deliberated on all Pre-Bid queries submitted by prospective bidders vis-à-vis the published tender document. The detailed point wise clarifications to the queries raised by various firms received in writing via email and by hand are as follows:

*(Handwritten signatures of committee members)*

<p>1. <u>M/s. SGS Weather &amp; Environmental, Gurugram</u></p>				
S. No.	Tender Reference	Point Description	Firm Query/Clarification	Recommendations of the Committee
i.	Clause 2.23: Pointing resolution 0.01 Deg or better.	0.01° or better	<p>The proposed antenna system has the pointing resolution of 0.02 degrees". Typical requirements for weather radar antenna pointing accuracy range from ±0.05 degree to ±0.1 degree.</p> <p>We would like to inform that currently IMD and IITM are using C Band Radar from Vaisala which have the same pointing accuracy as stated above and the Radars have proven their performance in last many years without any issue with the antenna pointing accuracy. Number of Similar C band Radars of Vaisala make are functional across the globe with excellent performance record.</p> <p>We request IMD to change this specification to "0.02 deg pointing resolution" so that we can offer similar quality Radar under technical collaboration from Vaisala.</p>	<p>The pointing resolution may be read as 0.02 degrees or better. Vendor shall give the details of the design and analysis on the encoder and servo system which effectively brings out the expected pointing accuracy with proper resolution in observation. Same will be tested during FAT and SAT with bore sight and point target to consider the acceptance of the system. The encoder selected should support this requirement, considering all implementation issues.</p>
ii.	Clause 2.29: Angular data resolution in AZ & EL axes 0.01° or better using 21 bits or better absolute angle Encoder.	0.01° or better using 21 bits or better absolute angle Encoder.	<p>Angular data resolution in AZ &amp; EL axes of 0.02° or better using 14 bits or better absolute angle Encoder". Vaisala weather radar is equipped with 14 bit absolute digital angle encoders, giving a resolution of about 0.02 degrees in the measurement.</p> <p>This is more than enough to monitor and control the antenna position and movement within the required tolerance. 21 bit angle encoders would mean angular resolution of about 0.0002 degrees, which is far beyond what is needed to control a weather radar antenna</p>	<p>Angular data resolution in AZ &amp; EL axes may be read as 0.02 degrees or better. Vendor shall give the details of the design and analysis on the encoder and servo system which effectively brings out the expected pointing accuracy with proper resolution in observation. Same will be tested during</p>

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			<p>with about 1 degree beam width.</p> <p>Number of Similar C band Radars of Vaisala make are functional across the globe with proven performance including IMD &amp; IITM. We would like to offer the similar proven technology of Vaisala for this C band Radar project.</p> <p>We therefore request IMD to change this clause as "Angular data resolution in AZ &amp; EL axes of 0.02° or better using 14 bits or better absolute angle Encoder."</p>	<p>FAT and SAT with bore sight and point target to consider the acceptance of the system. The encoder selected should support this requirement, considering all implementation issues.</p>
iii.	<p><b>Clause 2.34 (b)</b> Transmission Loss: better than 0.2 dB one way. Loss: better than 0.2</p>	<p>Transmission Loss: better than 0.2 dB one way.</p>	<p>The radome transmission loss is specified as 0.2 dB. The same need to be revised to 0.35 dB or better one way.</p>	<p>As per Tender Document.</p>
iv.	<p><b>FAT (Factory Acceptance Test)</b></p>	<p>The bidder shall submit detailed test plans for Factory Acceptance Testing (FAT) prior to shipment and Site Acceptance Test (SAT) after installation at site for system acceptance. The test plan shall require concurrence by the IMD.</p>	<p>Mention about FAT is seen in many parts of the document. However in the "Price Schedule" and "List of deliverables" though SAT is finding place as an item, FAT is not seen as listed.</p>	<p>The travel and lodging charges of IMD team designated to conduct FAT is borne by IMD. Therefore, not included in list of deliverables.</p>
v.	<p><b>Clause 12 (i)</b> Warranty- During warranty the bidder shall deploy trained manpower at each site</p>	<p>The Bidder shall deploy trained manpower at each site preferably Graduates in Engineering in Electrical/Electronics/Communication for</p>	<p>In the Warranty and CAMC clauses, mention about posting trained manpower at each site for supporting round the clock operation is seen. However in the "List of deliverables" and "Price schedule" this item is not seen listed.</p>	<p>Chapter - 3, CoC, Point: 12 (i) stands deleted.</p>

	preferably Graduates in Engineering in Electrical/ n Electronics/ Communica tion for maintenance support round the clock.	maintenance round the clock.		
2.	<u>M/s Bharat Electronics Limited, Bangalore</u>			
S. No.	Tender Reference	Point Description	Firm Query/Clarification	Recommendations of the Committee
i.	Chapter 3: Page No. 34 Table-1: Technical Specification  2.25 Cross polar radiation	Better than 36dB	Cross polar radiation of 30dB sufficient for meeting the Radar specifications as per RFP with modern radar signal processing techniques. Technical paper “ Polarization Isolation Requirements for Linear Dual-Polarization Weather Radar in Simultaneous Transmission Mode of Operation” by Yanting Wang, Member, IEEE, and V. Chandrasekar, Fellow, IEEE also indicates the sufficiency of 30dB cross polarisation. With the isolations at RF and digital available at different stages, and the feasibility to perform calibration and update biases of polarimetric variables, the radar performance requirement can be met with 30dB cross pol. In view of the above, the cross polarisation specification may be revised to 30dB.	Cross polar radiation may be read as 30 dB or better.
ii.	Chapter 3: Page No. 35 2.32.	c) The structural design should be certified by a competent third-party authorized agency.	1) Type of foundation and tower material are dependent on soil conditions of sites and height of tower, which has commercial	The details will be provided to the successful Lowest bidder (L1) after the

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	Tower height		<p>implications. Geographical conditions for remote sites such as rain/ soil/ wind etc. to be shared for estimating the tower installation related activities. Please provide the data.</p> <p>2) It is requested that the tower and foundation requirement is standardised to meet the requirements.</p> <p>Please consider and update RFP.</p>	<p>issue of Supply Order.</p> <p>However, the site specific civil foundation costing may be considered for worst case soil condition, since IMD is in the process of finalizing the exact location. The tower structural design specification is not having any change from the RFP.</p>
iii.	Chapter 3: Page No. 41 Power requirements	Power requirements	<p>As some of the site locations are in remote areas, in order to ensure the quality of power supply for the system, request that a requirement for 'Voltage Stabiliser' be added in the RFP.</p> <p>Please consider and update RFP.</p>	<p>Sufficiently rated Automatic Voltage Stabiliser (AVR) before the input to the UPS also shall be supplied as a deliverable. Cost of AVR to be added along with UPS bill of material by all.</p>
iv.	Chapter 3: Page No. 44 Table-1: Technical Specification 2.54. General	32) Communication hardware for data transfer to central location. Contractor shall provide all necessary communication hardware i.e. Firewall (UTM Protection 24x7 Forticare plus Application control, IPS, AV, Web Filtering and Antispam services)	<p>The specification "Forticare plus Application control" is a feature specific to a single OEM. The features- UTM Protection, IPS, AV, Web Filtering and Antispam services are available with multiple vendors. Request to generalise the requirement and update the RFP as "Communication hardware for data transfer to central location. Contractor shall provide all necessary Communication hardware i.e. Firewall (UTM Protection, IPS, AV, Web Filtering and Antispam services)"</p> <p>Please consider and update RFP.</p>	<p>Communication hardware i.e. Firewall (UTM Protection 24x7 Forticare plus Application control, IPS, AV, Web Filtering and Antispam services) <b>or equivalent to Forticare Plus.</b></p>
v.	Chapter 3: Page No. 50 5.4.2. Hydrolog	f. Rainfall intensity, rainfall rate and accumulation products shall have an option to be adjusted in real time by Rain Gauge. disdrometer	<p>Please provide data rate and format.</p>	<p>The details will be provided to the successful Lowest bidder (L1) after the issue of Supply</p>

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	y Products	<p>data. Rain gauge and disdrometer data shall be displayed along with the radar data. Rain Gauge and Disdrometer data will be made available by IMD in text format.</p> <p>g. Online Adjustment of rainfall rate by appropriate rain gauge or disdrometer data shall be possible.</p>		Order.
vi.	Chapter 3: Page No. 51 5.4.4. Warning and Forecasting Products	Workstation with TITAN software running in real time should be provided and made available with appropriate data intake.	Can Titan s/w be provided in "Display and NRT workstation" mentioned in Section 2.49. Please confirm.	<p>As per Tender Document.</p> <p>A separate workstation to be provided by the firm for Titan software.</p>
vii.	Chapter 3: Page No. 52 7.Provision for networking and communication system for data transfer to central location.	<p>h) Data of all radars to be overlaid on GIS map with option to include underlay maps from Google, Open street map or ESRI, Arc GIS etc. Locally installed and accessible GIS server using Open street map to be provided. The products which are to be overlaid are:</p> <ul style="list-style-type: none"> <li>• Reflectivity.</li> <li>• Rainfall,</li> <li>• Warnings based on Rainfall, Velocity, Hydrometeor classification.</li> </ul> <p>License for GIS shall be provided by the bidder.</p>	<p>The requirement may please be corrected as "Google GIS with Google maps OR Arc GIS with Openstreet maps" OR Is it "Data of all Radars to be overlaid on world map."</p> <p>Please confirm and update RFP.</p>	<p>As per tender document.</p> <p>WMS tiles are provided by Google, OSM, ESRI-Arc GIS etc. are to be overlaid on these with selectable underlay/overlay options.</p> <p>However, GIS server with OSM is also required to serve the map tiles to overlay radar products within local LAN.</p>

viii.	Annexure VIII Page No. 74	LIST OF TENTATIVE LOCATIONS FOR INSTALLATION OF EIGHT (08) Nos. C-BAND DUAL POLARIZED SSPA BASED DOPPLER WEATHER RADARS	For remote sites such as Kavaratti and Port Blair:  1) Exact Site location/position to be shared for study for Tower installation as civil foundation requirement to be assessed.  2) The necessary Govt./ local body environmental clearance approvals for survey/ transportation will be required to be provided for the remote sites.  3) At remote areas please confirm that the power supply (solar/ grid power) will be made available.  Please confirm.	The details will be provided to the successful Lowest bidder (L1) after the issue of Supply Order.  Details of seismic zone and wind load condition is already part of the RFP.  However, the site specific civil foundation costing may be considered for worst case soil condition, since IMD is in the process of finalizing the exact location. The tower structural design specification is not having any change from the RFP.
ix.	Chapter 3: Page No. 57 14. PROJECT SCHEDULE a) Delivery	i) Supply of first radar at site within 12 months from the issue of supply order.	i) Supply within 15 months for land based sites considering the lead times required for manufacturing. Subsequent 3 months for installation & commissioning.  ii) Delivery of Equipment for Island based sites (02 sites) 18 months to be considered due to geographical terrain, using sea routes and lack of proper transportation system. Subsequent 6 months for installation & commissioning to be considered.  Request to amend RFP accordingly.	As per Tender Document.
x.	EMD (Earnest Money Deposit) CH-2 (Conditions of	EMD in original to be submitted at IMD Office before tender closing date.	The EMD (Amount of Rs. 1,76,00,000) in the form of Bank Guarantee was submitted to the IMD office for the previous GeM Tender. Do we need to submit against the new EMD for the new Tender published or date extension (upto 240 days from the Bid closing date of EMD amount can be	The EMD for the new Tender published or date extension is required to be submitted again.

Contract) Para-7, Pg No-16		accepted?	
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**Note:** The Costing of every item, sub items offered in bidder's technical bid, shall be done with all breakup prices. The cost of Equipment and Services shall not be clubbed at any stage. The said tender on GeM has been uploaded with default (as available on GeM) terms such as payment terms, delivery schedule etc. In all the cases, terms mentioned under the tender document shall prevail.




(Dr. V. K. Anandan)

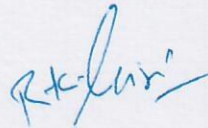
(Dr. G. Pandithurai)



(S. Gopal Krishna)



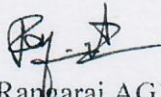
(Gajendra Kumar)



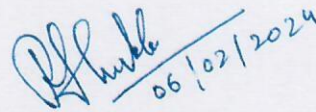
(Dr. R. K. Giri)



(B. A. M. Kannan)



(Rangaraj AG)



(Rohit Shukla)