

शुद्धिपत्र CORRIGENDUM-3 दिनांकित DATED 11-07-2024

निविदा सूचना सं TENDER NOTICE NO: I-I/ET-TPT/24004/24-25
दिनांकित DATED 03-06-2024
(Tender ID: 2024_ITERI_809677_1)

काम / मद का विवरण Work / Item Description: Procurement of Radiometer (140-170 GHz) and its essential accessories

बोलीदाताओं को सूचित किया जाता है कि उपर्युक्त निविदा के भाग-ए (II) और भाग-ए (III) में संशोधन किया गया है। संशोधन-1 दिनांकित 11.07.2024 के साथ बोली-पूर्व स्पष्टीकरण (अनुलग्नक-1) संलग्न है और इसे CPP पोर्टल <https://eprocure.gov.in/eprocure/app> के साथ-साथ संस्थान की वेबसाइट <https://www.iterindia.in/tenders> पर भी अपलोड किया गया है।

It is notified to the bidders that an Amendment-1 dated 11.07.2024 is made to Part-A(II) and Part-A(III) of the above mentioned tender. The **Amendment-1** along with **Pre-bid Clarifications (Annexure-1)** are attached herewith and also uploaded on CPP Portal <https://eprocure.gov.in/eprocure/app> as well as on Institute's website <https://www.iterindia.in/tenders>.

इस शुद्धिपत्र और इससे पहले जारी शुद्धिपत्रों को छोड़कर, सभी आवश्यक पात्रता मानदंड, तकनीकी विनिर्देश, नियम और शर्तें और उपरोक्त निविदा के अन्य विवरण अपरिवर्तित रहेंगे। Except this corrigendum and corrigendums made earlier, all Technical Specifications, Terms & Conditions and other details of the above mentioned tender shall remain unchanged.

Amendment-1 dated 11th July 2024

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1. Ref. Tender Part / Section No.	2. Ref. / Clause No.	3. In Place of	4. To be read as
Part A-II/ Section 4	Table 1	#4d to be added	Step resolution for the center frequency shall be less than the specified bandwidth
Part A-II/ Section 4	Table 1 #8	Max RF Input Power 5 dBm*	Removed
Part A-II/ Section 4	Table 1 #12	0 to 10 V output voltage proportional to the power at the radiometer input, bandwidth from DC to 1 MHz	0 to 10 V output voltage proportional to the power at the radiometer input, bandwidth from (a) DC to 1 MHz for measurements and, (b) DC – 20 Hz for calibration.
Part A-III/ 1.4.2	1.4.2.2	Contractor/supplier shall make complete delivery of all the ordered items on free door delivery basis (including packing, forwarding, freight & transit insurance) at ITER-India Lab building, IPR within 8 months from date of Contract/ Purchase Order. Final/site acceptance of ordered items at ITER-India lab shall be completed within 02 months from the date of receipt of all items at Purchaser's site.	Contractor/supplier shall make complete delivery of all the ordered items on free door delivery basis (including packing, forwarding, freight & transit insurance) at ITER-India Lab building, IPR within 12 months from date of Contract/ Purchase Order. Final/site acceptance of ordered items at ITER-India lab shall be completed within 02 months from the date of receipt of all items at Purchaser's site.

Annexure-1

Pre-Bid Clarifications

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1. Name of Bidder	2. Query No.	3. Ref. Tender Part / Section No.	4. Ref. Clause No.	5. Description of the query	6. Response of ITER-India
XYZ	1	Part A-II/Section 4	Figure 1	It's proposed by ITER-India to make radiometer using single down conversion for channels 1-8 and double downconversion for channels 9-16. We propose to allow to use double downconversion scheme for all the channels (actually, for channels 9-16 it will be even triple downconversion). Final downconversion converts frequency down to zero frequency. This proven and cost-effective scheme allows to obtain many advantages, for example – to make all the channels tunable by frequency.	There can be different configurations of radiometer based on the number of down-conversion stages, in order to meet the technical specifications. That is why we have clearly written that figure 1 is a “schematic representation of prototype radiometer”. We have not specified any fixed configuration of the radiometer in the tender document. It is on vendors to decide the best configuration which can meet the required technical specifications in a cost-effective manner.
XYZ	2	Part A-II/Section 4	Table 1, #1/ Table 2	Overall RF frequency range of the radiometer is 140-170 GHz, but tuning range of the last 2 channels proposed to be 2-18 GHz. It will lead to extension of the RF range up to 172.75 GHz (138.5+16+18+0.25). We propose to extend	Our requirement is 140-170 GHz, however, RF range extending beyond 170 GHz is better and hence acceptable. Regarding tuning range, it depends on the LO frequency being chosen and accordingly the IF frequency range. We leave this on vendors to decide the intermediate

				RF range up to 171 GHz and decrease upper limit of tuning range of the last channels to 16 GHz.	configuration. We must have a filter with a tunable frequency range such that it can be tuned from mid of RF band to the upper end of band ie. 170 GHz. Decreasing upper limit of tuning range of the last channels to 16 GHz is acceptable as long as this requirement is fulfilled.
XYZ	3	Part A-II/Section 4	Table 1, #2, #3a	We propose to make all 16 channels tunable in frequency (which is possible using double/triple frequency conversion). This will allow to exclude YIG-filters from the scheme. Frequency may be set as precise as 1 MHz with negligible temperature and other types of drift.	Technically this seems acceptable. YIG is a preferred solution. So far world-wide in our knowledge, only YIG filters have been used in this kind of application, that is measurement of temperature fluctuations. What you are proposing is an alternative approach and therefore request you to provide detailed configuration at this stage for better understanding.
XYZ	4	Part A-II/Section 4	Table 1, #4b	It's unclear if filter bandwidth really should be tunable and how many steps should be used. We propose to specify steps of the bandwidth, for instance 100, 200, 500 and 1000 MHz for all the channels.	Center frequency is tunable, not the bandwidth. The step resolution for the center frequency shall be less than the bandwidth ie. less than 200 MHz (if bandwidth is 200 MHz). Refer to tender amendment-1.
XYZ	5	Part A-II/Section 4	Table 1, #6	We propose to make the sensitivity tunable (otherwise it will be hardly possible to make measurements in plasma and perform the calibration with built-in noise source and/or with hot body method). We propose to revise this clause as follows: «The upper	Yes, this should be okay.

				limit of the dynamic range of the input radiation temperature at the radiometer input for a bandwidth of 0.5 GHz (resulting in an output of 10V) ranges from 1000 K to 100E6 K with a step of no more than 10 dB». Upper limit of 100E6 K presumably should be enough considering the attenuation of the waveguide line.	
XYZ	6	Part A-II/Section 4	Table 1, #8	<p>To ensure that the radiometer can handle input powers as high as +5 dBm, especially within the linear regime of the mixer (the best available mixer allows a maximum of 0 dBm at the input and -10 dBm for linear operation), an attenuator should be used in front of the radiometer. However, the attenuator increases the system's noise figure (NF) by the value of the attenuation.</p> <p>It should be clarified if the +5 dBm power is in the 140-170 GHz range. This corresponds to a temperature of 7.6E9 K, which is not realistic. However, if such high power in the 140-170 GHz range is possible due to short impulses, an active protection system with a regulated attenuator could be used instead of a constant attenuator. If most of the power comes from frequencies outside</p>	<p>The maximum power is already taken care of by the minimum detectable power and the dynamic range. Hence max power specification is removed.</p> <p>Refer to tender amendment-1.</p>

				the 140-170 GHz range, filtration can be used (which is necessary for image rejection anyway).	
XYZ	7	Part A-II/Section 4	Table 1, #12	We suggest adding a condition that all output signals, apart from the analog mode, should be duplicated as a 16-bit digital stream with a sampling frequency of at least 2 MSamples/s. This will help exclude interferences from other systems, which is a common issue based on real experience working with TOKAMAKs. The Ethernet channel can be used to transmit the digital data, as it is already necessary for controlling the frequencies of the tunable channels and sensitivity.	It is not mandatory to duplicate all analog signals for monitoring into 16-bit digital stream. However the bidders may propose such digital streaming for controlling parameters of the radiometer such as gain, tunable frequency etc.
XYZ	8	Part A-II/Section 4	Table 1, #12	We suggest to make video bandwidth selectable: for measurements DC – 1 MHz, for calibration – DC – 20 Hz.	Added in the table. Refer tender amendment-1.
XYZ	9	Part A-II/Section 5.1 and 5.2	Table 3, Table 4	We suggest incorporating a built-in controllable noise source, connected internally via a directional coupler and controlled by the radiometer software, to ensure automatic recalibration when necessary. This scheme is much more reliable than using a waveguide switch and	Both configurations either built-in or external noise source with a waveguide switch are acceptable. If offered configuration is built in, then price for line item #1.02 and 1.03 will be zero. Line item #1.01 should include price of radiometer with built in configurations (noise

				allows for faster and more frequent recalibration. If this is acceptable, a separate noise source is not necessary, as it will be built into the radiometer, and an electromechanical switch will not be needed at all.	source with full band isolator, waveguide switch & power supply for both).
XYZ	10	Part A-III/1.4.2	1.4.2.1 and 1.4.2.3	In section 1.4.2.1, it is stated that the "Delivery of Radiometer and its essential accessories, Test Reports, Software, Documents/Operating manuals should be completed in 12 months," whereas in section 1.4.2.3, the deadline is 8 months (delivery) + 2 months (acceptance). The actual deadlines remain unclear.	The typo error is corrected. Pl refer tender amendment-1.