Ref. No. NCRA/SKAO/2024/EoI-10

Request for Expression of Interest (EoI)

regarding work for the

Construction Phase

of the

Indian contribution to SKA-Low Signal Processing Sub-System (SPS) and allied electronic manufacturing and testing services

for the

Square Kilometre Array (SKA) Telescope

SKAO

National Centre for Radio Astrophysics jointly with Raman Research Institute
under the umbrella of SKA India Consortium

Address:
NCRA-TIFR
Pune University Campus
Post Bag 3, Ganeshkhind
Pune 411007

EoI Document Fee (Non-refundable)– Rs. 8850/- Incl GST by DD along with the EOI Response

IMPORTANT DATES :

EoI Download start Date	1st March 2024	
EoI Download End Date	21 days from above	21.03.2024
EoI Pre-submission meeting Date and Time	15 days from date of advt	15.03.2024
EoI Submission Date	32nd day from date of advt	01.04.2024
EoI Opening Date	33rd day from date of advt	02.04.2024

ABOUT the BIDDER:

Name of the Firm / Company	
Address of the Firm / Company	
Authorised Representative's name(s)	
Email Id, Mobile Numbers	

Table of Contents

CHAPTER-I

A. Definitions:

Expression of Interest (EoI) is also referred to as Bid or Proposal

Company/Organisation is also referred to as Bidder

NCRA and/or RRI are also referred to as Centre, Institute or Client

Bidder/Vendor is referred as the Party who is submitted this EoI

B. Check list

(please attach one consolidated pdf file for each item in the checklist)

Sr. No.	Particulars	Provide Details	Enclosed
1	Demand Draft towards EoI Fee enclosed (For Rs. 8850/-)	D.D.No.… Dtd…….	**Yes / No**
2	Copies of Registration Certificates for Firm/Company/MSME etc. obtained from statutory authority and valid till date.		**Yes / No**
3.	Copies of all relevant registrations such as MOA, PAN, TAN, GST, etc.		**Yes / No**
4.	Company Profile enclosed including history for the past seven years of business.		**Yes / No**
5.	Details of all works of similar nature Of assignment (i.e. hardware development projects of similar complexity executed from India) completed during the period up to last seven years ending 31st March, 2024, in a list. Please attach certified copies of all Work Orders/Orders and Certificates from Clients. Mentioned at Sr. No. 4 in the		**Yes / No**

	eligibility criteria.		
6	Undertaking letter stating that the bidder has necessary in-house infrastructure, trained personnel and expertise for meeting technical requirements mentioned in this EoI (see Sr. No. 6 in the eligibility criteria). Also undertaking that no subcontracting will be done outside India by the bidder for manufacturing, assembly and testing tasks, if selected.		**Yes / No**
7	Recently obtained Certificate from your CA firm, indicating Annual Turnover and Profit or Loss for the past five years. Also enclose certified copies of Balance Sheet and P&L statements, Copies of Audit Reports.		**Yes / No**
8	Solvency Certificate from the nationalised bank having your current account, recently obtained for a value not less Rs. 20 Cr.		**Yes / No**
9	Hard copy of this EoI document duly signed and sealed on each page, for accepting the terms and conditions, along with all certificates, documents, enclosed.		**Yes/No**
10	Copy of GST registration certificate enclosed.		**Yes/ No**
11	Copy of power of attorney to sign the bid enclosed (Applicable for LLP / partnership company / PVT LTD / LTD Company)		**Yes / No**

12	Declaration stating that there is no legal action ongoing against the organisation for any cause. If any legal action exists, the bidder has to undertake that it does not affect its liability to deliver the EoI requirements. The bidder shall provide all the details of such action(s).		**Yes / No**
13.	Declaration-cum-Undertaking that your company/organisation has not been black-listed or debarred from participating in any procurement activities by antsy State or Central Government or any other government organisation in India or abroad.		**Yes / No**
14.	Copies of relevant certificates, reference documents from the respective clients certifying technical, delivery and execution capability of the bidder. These certificates should be signed by the clients with their names, contact details.		**Yes / No**
15.	Copies of required certificates/ policy documents with regard to quality standards for manufacturing, assembly and testing that are relevant for the works mentioned in Chapter IV of this EoI.		**Yes / No**
16.	Any other documents / certificates, that bidder would like to submit		**Yes / No**

CHAPTER - II

INTRODUCTION

The Square Kilometer Array (SKA) (see also https://www.skao.int/ for more extensive information) is a next generation radio telescope to be constructed jointly by an international consortium of countries, involving participants from both academia and industry. The SKA will be a revolutionary telescope, both in terms of expected science output as well as the engineering challenges in building it. The telescope will be located in radio quiet regions in South Africa and Australia, with operational headquarters near Manchester, UK. Construction of Phase 1 of the SKA, which started in early 2022, has a total cost of about 2000 million Euros, spread out over a 8 year period (2022-2030) : 5-6 years of construction, followed by 2-3 years of commissioning, early science, and stabilisation towards routine operations. The construction of the SKA is being overseen by the SKA Observatory (SKAO), which is an intergovernmental treaty organisation with individual countries as members.

India has worked extensively with the SKA project since its early years, including during the design phase (2014-2019), as well as during the prototyping and bridging phase (2019-2021). Recently, the Government of India has approved the proposal for India to join the SKAO as a member country and to participate in the construction phase through the development and delivery of various software and hardware components. Through the design and prototyping phases, India has established its position as one of the lead countries for participation in the building of the Observatory Management & Control (OMC) system during the construction phase, with active participation from Indian industry. India is now looking to establish its role in the building of the digital Signal Processing Sub-System (SPS) and allied activities during the SKA construction phase, with primary focus on the SKA-Low telescope. This request for Expression of Interest (EoI) is focussed on this aspect of India's contribution.

During the detailed design phase of the SKA, which concluded about 4 years ago, the work done covered different technical aspects of the SKA, ranging from the receptors (e.g. dishes, dipole arrays) to the signal transport sub-systems, the signal processing sub-systems, the data processing sub-systems, the infrastructure sub-systems etc. One such major sub-system is the **SKA-Low Signal Processing Sub-System (SPS)** which is designed to receive the Radio Frequency (RF) signals generated by the SKA-Low dipole antennas in the field nodes (or stations), and deliver the beamformed digital signals to the SKA-Low Correlator and Beamformer sub-system for further processing (see item #1 in Section 4.5 for an overview of the SKA-Low and item #3 in Section 4.5 for details of SKA-Low SPS). The detailed design of the SKA-Low SPS was carried out by a consortium led by members from Italy (see item #4 in Section 4.5 for details of the system). The digital processing modules in the SPS will make use of the state-of-the-art ADCs, complex FPGAs, memory, multi gigabit QSFP, and several SMD components housed in 100s of multilayer (16 to ~24) PCBs.

For the construction phase, Italy has been identified as the lead country for the construction of the digital sub-systems of the SKA-Low SPS, with India as one of the other major contributors. It is expected that there will be a Tier-1 lead company from Italy that will be overall responsible for delivery of the SKA-Low SPS, and a suitable company (or companies) in India will be identified for the delivery of the in-kind contribution expected from India. The activities will be carried out in-country, with contracts to Indian industry, backed with technical skills of staff from the various research organisations in the SKA India team for integration, testing and final delivery to the SKA project. These activities are expected to

bring technology gains to both Indian industry and research organisations, in state-of-the-art radio frequency electronics, digital signal processing technology, and next generation firmware and software development.

The bulk of the work in India is expected to be carried out from around the end of 2024 through 2025, and possibly into early 2026. The work in India will be via a contract between the relevant Indian institute (such as RRI and/or NCRA) with the selected Indian company (or companies), as part of India's in-kind contribution to the construction phase of the SKA, and will be paid for via funds from the Government of India that have been sanctioned consequent to the approval for India to join the construction phase of the SKA. The total value of the works to be executed in India and delivered to the SKAO as part of the above activities, is expected to be around 70 Crores.

CHAPTER - III

AIMS and OBJECTIVES

Through this EoI, NCRA would like to invite interested government, private and public sector organisations in India to indicate their interest and capability for participation during the construction phase of the SKA, for activities related to the SKA-Low SPS work package. All such submissions will be evaluated by a technical committee and a final shortlist of organisations who meet the eligibility and evaluation requirements will be prepared. This shortlist can be used for competitive bidding for any digital processing system related contract that is part of India's contribution to the SKA construction phase activities, by any other organisation in India that is contributing to such activities. Award of the actual work contracts will then be done via tenders floated amongst the shortlisted organisations. The EoI outcome will be valid for a period till India continues to be contributing this system work package to the SKA Project.

CHAPTER - IV

SCOPE OF WORK - TECHNICAL DOCUMENT

4.1 The Square Kilometre Array (SKA)

The Square Kilometer Array (SKA) is a proposed next generation radio telescope to be constructed jointly by an international consortium of countries that involves contributions from both academia and industry. This ambitious facility pushes the envelope in many areas of technology and is an unprecedented engineering challenge. Phase 1 of the telescope is expected to be completed by 2028 and become fully operational by 2030, and will cost about 2 billion Euros. The SKA will be built as two telescopes - the SKA-Mid in South Africa and the SKA-Low in Australia. At each site, hundreds to thousands of radio receptors located over ~ 100 km region will be linked to create the most sensitive radio observatory to date. The SKA Phase 1 will operate at frequencies ranging from 70 MHz to 10 GHz (to be later extended to 30 GHz), achieved through dipole arrays (SKA-Low in Australia) and dish antennas (SKA-Mid in South Africa). The SKA Observatory is expected to answer fundamental questions in astrophysics about the nature of gravity, the role of magnetism, the formation of the first stars and galaxies, and possible extraterrestrial life.

During the design and early prototyping phase (2014 to 2021), the SKA development was coordinated by the SKA Organisation, a not-for-profit company located in Manchester, UK. India was a member of the SKA organisation and contributed actively to the design and prototyping phase. In 2021, the SKA Organisation transitioned to an inter-governmental organisation known as the SKA Observatory (SKAO) whose main goal is the task of building and operating the SKA telescopes. A detailed proposal was submitted to the Government of India for India to join the SKAO as a member country and to contribute to the construction of the telescope. This has recently been approved with funding sanctioned till 2030, opening the doors for full-fledged participation of India in the SKAO construction and commissioning phases. The main areas of Indian contribution are expected to be in software development, particularly in the area of Observatory Management and Control, in digital electronics and signal processing for the SKA-Low SPS, in some areas of the RF electronics of SKA-Mid and some aspects of the science data processing sub-systems. Indian scientists will participate in using the telescope for doing science, after the telescope construction is completed, and are expected to lead some areas of the scientific research with the SKAO.

4.2 Overview of the SKA-Low Signal Processing Sub-system (SPS)

The SKA-Low site is located in the desert of Western Australia's Murchison shire where 131072 dual polarisation antennas are to be clubbed into 512 stations (spread out over ~ 150 km region), resulting in signals from 256 such antennas being processed at each station. The signals from each antenna are sent to a smartbox located at the station, where the electrical signals are converted to optical signals for transmission over optical fibre to the on-site Central Processing Facility (CPF) where they are processed in the SPS electronics consisting of 256 single sided cabinets each containing 32 TPM boards (also referred as iTPM boards in some reference documents), requiring a total of 8192 TPMs. The cabinet design takes into account design criteria of a large installation and specifically the target location, which is the middle of the Australian desert: in particular energy efficiency, cost, reliability and maintenance. Hence the system must withstand strict international/military standards.

The SPS consists of subsystems with the following details :

- TPM: The SKA-Low Tile Processor Module is 32 channels 1 GSPS 12 bits Analog to Digital conversion and processing board equipped with management functions to support the integration into a rack structure. It has best-in-class 14 bit AD converters, last 16 nm FPGA, 40 Gbit Ethernet optical link have been selected focusing on the best commercial compromise between quality, performance and power consumption. Compact board size, low noise clock network, advanced 14-layer board build-up, complete Ethernet based management features (including health monitoring capability), high efficiency and low noise power distribution system complete the main board features. The TPM also provides for external synchronization signals and high speed DDR4 memory banks to allow RAW data buffering. An on-board 32 bit microprocessor and large flash memories allow high-level management operations including on line multiple configuration selection and structured communication with infrastructure management applications. The TPM board will be provided with a low-level management firmware to perform board configuration and monitoring through the Ethernet interface exploiting a UDP based protocol.

- SUBRACK: A subrack integrates 8 TPM boards each with local management functions, namely power supply, clocks and Ethernet. A Subrack Management Board (SMB) provides a backplane for connecting and managing multiple TPMs with a sub-rack. It acts as a distribution board for power, network and other signals such as clock and PPS. It controls TPMs on and off functionality and measures power consumption. SMB has a CPU with Linux OS to manage high level operations.

- Subrack Mechanics : The main structure of subrack is a standard 6U, 19" chassis "europacPRO" from Schroff. (https://schroff.nvent.com/en-in/products/enc24567-474) Standards and certification of the europacPRO Subracks are:
    - Internal and external dimensions in accordance with:
        - IEC 60297-3-101/ IEEE 1101.1
        - IEC 60297-3-102 / IEEE 1101.10/11
        - IEC 60297-3-103
    - Type of protection IP20 in accordance with IEC 60529
    - EMC testing in accordance with VG 95373 part 15
    - Shock and vibration test report:
        - Railway standards BN411002; BN411003, NFF 61005, NFF60002
        - IEC 61587-1, EN 50155

  The SPS subrack shall require an airflow of less to 80 l/s of air at nominal atmospheric pressure, (front to rear), with maximum inlet temperature of 40°C to guarantee proper heat dissipation. In order to guarantee the temperature required within the Cabinet, this should be as airtight as possible. On the frontside of the Cabinet there is an overpressure due to the fans load, while on the backside the depression is caused by fans suction. The air must be forced to pass through the elements to be cooled, therefore all the other passages between front and back of the Cabinet, must be closed (on the front of the cabinet all 42U must be occupied either by components or by closing panels, there shouldn't be open spaces).

- BACKPLANE: The backplane is sited on the back of the subrack chassis and provides each TPM with power and services required for LFAA operations. It has 8

slots for the TPMs, 1 slot for the SMB, 1 for power supply. It distributes Gbe ethernet, power supply, PPS and 10MHz low RMS jitter clock to each TPM. The Backplane board specification are as follows:

- MHz RMS jitter contribution < 200 fs (tbc) with low insertion loss path
- 10 MHz isolation (vs all other signals) > 60 dB
- Power connector shall be capable to supply each TPM with 10A of maximum current
- Mechanical size shall be about 480x160 mm for the 8x version
- The PCB mechanical shall be designed in accordance with the subrack mechanical specification that will be delivered by INAF
- The layout shall guarantee very low DC resistance for the power distribution bus from source to TPM, maximum 1 mOhm/m.

- POWER SUPPLY: The subrack is designed with two removable & replaceable commercial redundant single phase AC power supplies (220V, 16A, 50/60 Hz) with 12V DC output joined together in the backplane. These two devices are capable of 1300 Watt each, 108 A, with maximum efficiency of 94% at half load. In normal condition, power supply modules work together at about 40% of their maximum capacity, close to the efficiency peak. In case of single power supply failure, the load can be raised to 80% without functional limitation. The detailed specifications of power supply are as follows
  - 1300W AC
  - DC power-factor-corrected (PFC) power supply with 12VDC output
  - Unit: FCI 10135322-002LF or equivalent
  - Counterpart : FCI 10108888-R10253SLF
  - Mechanical dimensions : 54.5(w)x40.0(H)x321.6(D) mm
  - Class A radiated/conducted/harmonic emission.

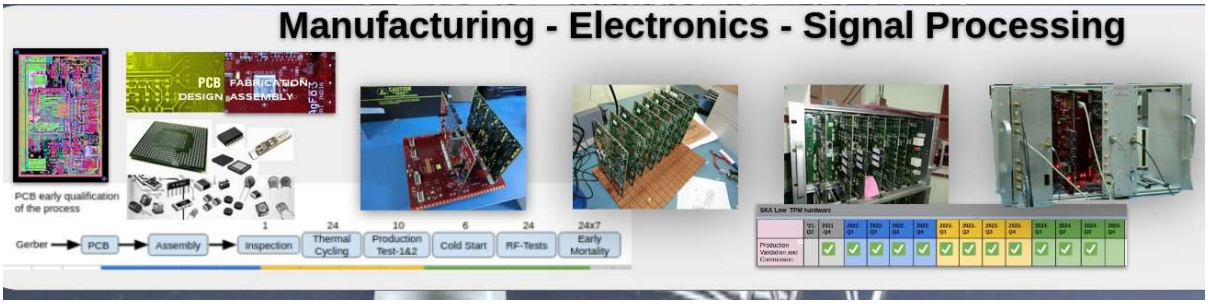

Figure-1 : illustrating the sequence of the work required for SKA-Low SPS

4.3 Scope of work expected from the Bidder:

The scope of work is expected to include fabrication, assembly, integration of SKA-Low subrack with TPM boards and backplane and the Subrack Management Board (SMB) – see Figure-1 for an illustration. The system needs to go through stringent functional verification tests that include electrical tests as well as digital signal integrity tests for all the items in the subrack. The number of TPM boards to be manufactured for the full SKA-Low design are 8192 and total number of subracks is 1024. For the current design baseline, the total number

of stations, subracks and TPM boards is expected to be around 70-80% of the full SKA target, to be executed over a span of 2-3 years. In this, India's contribution will be ~25% of the above quantity mentioned i.e. around 2048 TPMs and 256 subracks. The exact scope of Indian contribution will be finalised by around the middle of 2024. The expected production capability should be 100-200 TPM boards/month, and the total quantity requirement will be up to 2500 boards. First few TPM boards manufactured by the Bidder will have to go through the First Article Inspection (FAI) process which requires clearance for further production of boards. The delivery of TPM boards for the international project will need to adhere to the international SKA-Low timeline and must meet necessary international industrial/military grade testing standards. Manufacturing of semi-populated subrack should also follow the TPM manufacturing timeline. Significant amounts of quality, inspection and validation involving bare board tests to assembled board signal tests, temperature, power cycling efforts are involved. Validation tests would involve semi automated tests, with computer based test jigs and skilled personnel. Overall, the scope of work will include (a) mass production of these technology products and (b) assembly, validation and delivery of the end products, at the desired scale.

4.4 Additional scope of work

In addition to the scope of work defined above, it is possible that additional work in digital hardware development and production may become available for India to contribute to the SKAO. In such case, as and when it happens, the selected bidders would be eligible for participation in such additional activities.

4.5 Additional information

1) An overview of the SKA-Low can be found at the following location: https://www.skao.int/en/explore/telescopes/ska-low :
   The URL provides SKA-Low specifications, working principle and comparison of low frequency telescopes.

2) The SKA has published a number of key documents at the following URL:
   https://www.skao.int/en/resources/402/key-documents
   The site includes SKA Annual Reports, Executive Summary , SKA Phase-1 Construction Proposal, Observatory Establishment and Delivery Plan. These documents cover in depth scientific motivation, the broad impacts, design, verification and commissioning.

3) The basic signal processing module named Tile Processing Module description can be found out at below URL:
   https://www.sanitaseg.com/project/itpm-adfe/
   and
   https://indico.ict.inaf.it/event/535/contributions/1282/attachments/840/1187/ICT_2017_MATTANA.pdf
   https://www.ira.inaf.it/Library/rapp-int/514-18.pdf
   Above URLs describe the block diagram & hardware details of SKA-Low Tile Processing Module (TPM) and the subrack details. The presentation by Andrea Mattane presented in ICT Workshop 2017 - Bologna gives in-depth details of the test

setup and testing procedure for Analog to Digital Unit (ADU) of TPM board.

4) In-depth details of the digital hardware platform designed for the Low Frequency Aperture Array (LFAA) component of SKA can be found in an IEEE published paper titled "Development of a New Digital Signal Processing Platform for the Square Kilometre Array" by G. Naldi; G. Comoretto; R. Chiello; S. Pastore; G. Pupillo; A. Mattana in 2018 2nd URSI Atlantic Radio Science Meeting (AT-RASC) and the URL is : https://ieeexplore.ieee.org/document/8471592
covering hardware overview of Analog to Digital Unit (ADU) & Pre-ADU - a part of Tile Processing Module (TPM), LFAA signal processing firmware etc.

5) The SKA Observatory has published a number of **key documents** at the following URL: https://www.skatelescope.org/key-documents/
These include a high level executive summary, the SKA Phase 1 construction proposal and the observatory establishment and delivery plan. A number of other key design documents describing the telescope in great detail are also available at the same URL.

For further technical clarifications please write to:

- Prof. Yashwant Gupta (ygupta@ncra.tifr.res.in), NCRA-TIFR, Pune
- Dr. T. Prabu (prabu@rr.res.in), RRI, Bengaluru
- Mr. S.C. Chaudhari (scc@gmrt.ncra.tifr.res.in), NCRA-TIFR, Pune

For clarifications on administrative and procedural matters please write to:

- Dr. J. K. Solanki (solanki@ncra.tifr.res.in), NCRA-TIFR, Pune

Postal Address:
National Centre for Radio Astrophysics (NCRA)
Tata Institute of Fundamental Research
University of Pune Campus,
Post Bag 3, Ganeshkhind,
Pune 411007

Tel - 020 2571 9000/9111
Fax - 020 2569 2149

CHAPTER – V

Eligibility Criteria:

Table of Eligibility Criteria is as follows

Sr. No.	Eligibility Criterion	Supporting documents to be supplied
1.	Bidder must be a Firm / Company / MSME registered under the Indian Company Acts OR a Society registered under Societies Act, 1860 OR a PSU / Autonomous bodies or any other venture not covered above, registered under the relevant Government Statute and authorised to carry out the services / business. Joint Ventures and Consortia are not permitted.	Valid Registration Certificate(s)
2.	Bidder must have all relevant registrations such as Incorporation Certificate, MOA, PAN, TAN, and GST, Tax etc.	Copies of all certificates with current validity
3.	Bidder must have been in the business for the past seven years prior to this advertisement.	Documentary proof of business for 7 years
4.	The Bidder should have executed projects of sufficiently large scale or complexity. In particular, the bidder should have executed at least one of the following, during the last 5-7 years : (i) a single large project of total value of 40 Cr or more with a single client (ii) two projects, each of total value of 30 Cr. or more, with same or different clients or (iii) three projects, each of total value of 20 Cr or more, with same or different clients.	Certified copies of work orders / POs and certificates from clients.
5.	Bidder should have executed at least one project of scale or technical complexity similar to the requirements of this EoI, in the field of hardware development, carried out in India.	Relevant PO/Work order copy and certification from client.
6.	Bidder must have the necessary in-house infrastructure, trained personnel and expertise for meeting the technical / work requirements in Chapter IV. No subcontracting outside India will be allowed for manufacturing, assembling and testing tasks.	Details about infrastructure and facilities relevant for this EoI, including any associated certifications.
7.	Bidder must submit relevant reference documents, information and certificates from the respective clients certifying technical, delivery & execution capability of the bidder, signed by the client; and the contact names & numbers of all such clients (including those in #4 & #5 above).	Relevant certificates, letters, declaration, etc. along with contact details of the clients.
8.	The bidder should have average annual turnover of at least Rs. 50 Cr (Rupees Fifty crores) during the last three financial years (2022-23, 2021-22, 2020-21) from similar activities. The Balance Sheet, P&L statements	Annual Turnover Certificate from the authorised CA Firm for the relevant period.

	of the company for the last five years should be positive (excluding Covid period).	
9.	Bidder must submit a Solvency Certificate from a Scheduled Bank from India where the Bidder has a working current account, for at least Rs. 20 Cr.	Solvency Certificate from Scheduled Bank obtained for this purpose only.
10.	The Bidder should have in place the required quality standards for manufacturing, assembly and testing.	Certifications / Relevant Policy Documents
11.	Bidder's firm should not have been black-listed / or debarred from participating in any procurement activities by any State or Central Government or any other government organization in India or abroad.	Undertaking to this effect on official letterhead.
12.	The bidder must warrant that there is no legal action ongoing against it for any cause in any legal jurisdiction. If such an action exists and the bidder considers that it does not affect its ability to deliver the EOI requirements, it shall provide details of the action(s).	Declaration to this effect on official letterhead.

CHAPTER - VI

EVALUATION PROCESS:

1. The objective of the evaluation process is to evaluate the bids (EoIs) to select suitable organisations having technical competence and capabilities for engagement for the projects mentioned in the scope of work (technical) in Chapter-IV.
2. The evaluation will be undertaken by a Technical Evaluation Committee (TEC) formed by the appropriate competent authority / Centre Director, NCRA. The TEC would have external experts and officials of the Centre.
3. Only bids from Bidders meeting the eligibility criteria as per Chapter-V and submitting complete and responsive bids will be considered for evaluation.
4. The Centre and TEC will carry out the initial scrutiny to ascertain compliance with the Eligibility criteria listed under Chapter-V, and elimination of those bidders who do not meet the required eligibility criteria. Proposals not conforming to the eligibility criteria will be rejected.
5. The TEC will evaluate the EOI responses from the eligible Bidders (as determined form item #s 3 & 4 above) and short list only those who demonstrate and sufficiently establish their competence and capability to deliver specified services, as per the scope of work mentioned in the EoI. The decision of the Centre is final and binding on all the bidders.
6. The evaluation criteria shall be based on the requirements, stated elsewhere in this document : evaluation table (given later in this chapter) and general terms and conditions (Chapter-VII). The evaluation will also take into consideration the supporting documents.
7. TEC and the Centre are authorised to interact with the Bidders for discussions, clarifications etc. during the evaluation process. The TEC can seek more documents and information from the bidders. The responses and outcome from these will also be taken into consideration in the evaluation process. TEC may also visit the facilities of the Bidder for evaluating the technical capabilities.
8. Eligible Bidders would be invited by the Centre to make exclusive presentations to the TEC detailing their response to the EoI. The Bidder(s) would be required to present details of their experience and expertise in handling similar projects which would be evaluated by the TEC. It is expected that the Bidder provides the details for each of the implementations separately, covering the complete scope of work. The Bidder(s) would be required to present details of the company profile, as well as demonstrate commitment, technical competence / capability to provide the services required, over the entire duration of the work as defined in Chapter-IV.
9. The decision of the TEC as approved by the Competent Authority of the Centre shall be considered final.
10. The Centre at its discretion or recommendation of the TEC, may reject the proposal of a Bidder without giving any reason whatsoever, if in the Centre's opinion, the Bidder could not present itself as detailed in the proposal / submission.
11. The Centre reserves the right to change the evaluation criteria and evaluation process for this EoI, till the date before the “Date of submission of EoI”. Bidders are advised to keep checking of any changes, at the website link : xxxxx
12. The Centre reserves the right to suspend or cancel the entire process, reject one or all bids, without assigning any reasons. The Centre may stop any of the activities / processes of this EoI, for reasons beyond its control.
13. Dispute arising out of this EoI or related aspects: For any dispute arising out of this EoI submission and evaluation process, it should be the intention of both the parties to

settle the matter amicably without referring it to the Court of Law. For any unresolved dispute, the matter will be referred to the competent higher authority in TIFR, whose decision will be final and binding on both the parties.

14. Jurisdiction : in Pune courts only, if required.

Evaluation Table (including, but not limited to the following) -- to be used by the TEC for evaluating each of the bids received, alongwith the detailed Technical Evaluation Report, for making the final decisions (NOT TO BE FILLED BY THE BIDDER) :

Sr.No.	Evaluation criterion	Criterion met or not (to be evaluated by the TEC)
1.	Bidder has submitted all the documents as per the eligibility criteria table in Chapter-V, and the same have been reverified by TEC.	YES / NO
2.	Bidder has demonstrated technical competence and capability, as per item #4 in the eligibility criteria table in Chapter-V	YES / NO
3.	Bidder has demonstrated technical competence and required experience, as per item #5 in the eligibility criteria table in Chapter-V	YES / NO
4.	Bidder has satisfied the requirements as per item #6 of the eligibility criteria table in Chapter-V	YES / NO
5.	Bidder has satisfied the requirements as per item #7 of the eligibility criteria table in Chapter-V	YES / NO
6.	The Bidder has satisfied eligibility criteria #8 and #9 of the eligibility.	YES / NO
7.	Bidder has quality certifications with regard to quality of their internal processes and services delivered, meeting the eligibility criteria at # 10.	YES / NO
8.	Bidder has the team of professionals having domain knowledge and experience – meeting the Centre's requirements, meeting the eligibility criteria at #10	YES / NO
9.	The presentation made by the bidder satisfies that the bidder will be able to carry out hardware development work under the scope of this EOI which is aligned with the Shared Vision of SKA requirement.	YES / NO
10.	Bidder is ready to depute their representative for face-to-face meeting as and when required, to sort out any issues	YES / NO
11.	Bidder is aware that the Centre may add or delete some of the activities by giving a notice and the Bidder is ready for the same	YES / NO
12.	Bidder has responded to any additional inputs or information sought by the TEC	YES / NO

Notes :

(i) Outcome of the evaluation process will be communicated to all the bidding parties.

(ii) Only the selected bidders/organisations will be empanelled for further course of action such as submitting technical bids for specific work proposed based on the requirements. During these processes, the Centre may ask the empanelled bidders to provide more information about their financial terms and conditions, including rate charts.

(iii) The list of the empanelled bidders will be valid for the period for which India is contributing to the SKA project OR earlier. In case of any bidder becoming technically or otherwise disqualified / ineligible at any point of time, such bidders will be removed from the list of empanelled bidders.

CHAPTER - VII

GENERAL TERMS AND CONDITIONS

1. Language of Bids: All Bids and supporting documentation shall be submitted in English. The proposal should be prepared in English in PDF format.
2. Adherence to terms and conditions: The bidders who wish to submit responses to this EoI should note that they should abide by all the terms and conditions contained in the EoI. If the responses contain any extraneous conditions put in by the respondents, such responses will be disqualified and will not be considered for the selection process.
3. The Centre reserves the right to:
    a. Reject any and all responses received in response to the EoI without assigning any reason whatsoever
    b. Cancel the EoI/Tender at any stage, without assigning any reason whatsoever
    c. Waive or Change any formalities, irregularities, or inconsistencies in this proposal (format and delivery). Such a change/waiver would be duly and publicly notified in the Centre's website before the closure of the bid submission date
    d. Extend the time for submission of all proposals and such an extension would be duly and publicly notified in the Corporation's website
    e. Share the information/ clarifications provided in response to EoI by any bidder, with all other bidder(s) /others, in the same form as clarified to the bidder raising the query.
4. Confidentiality: Information relating to the examination, clarification and comparison of the Proposals shall not be disclosed to any Respondents or any other persons not officially concerned with such process until the identification process is over. The undue use by any Respondent of confidential information related to the process may result in rejection of its Proposal. During the execution of the project except with the prior written consent of the Centre, the Consultant and its personnel shall not at any time communicate to any person or entity any confidential information acquired in the course of the Contract.
5. DISCLAIMER : The Centre and/or its officers, employees disclaim all liability from any loss or damage, whether foreseeable or not, suffered by any bidder/consultant/person acting on or refraining from acting because of any information including statements, information, forecasts, estimates or projections contained in this document or conduct ancillary to it whether or not the loss or damage arises in connection with any omission, negligence, default, lack of care or misrepresentation on the part of Corporation and/or any of its officers, employees.
6. Should the bidder have additional information to submit that cannot be encompassed by the current table of contents, additional sections may be added at the end or additional papers may be added.
7. The bidder has to submit the response in hard copy and soft copy (by email or CD or pen drive) at the address given on the cover page. All items submitted should be neatly labeled and should also include the name of the bidder.
8. For any clarification with respect to this EOI, following officials, nominated point of contacts, may be contacted by way of following communication means: -
    a. Prof. Yashwant Gupta ygupta@ncra.tifr.res.in , 020 25719242
    b. Dr. J. K. Solanki solanki@ncra.tifr.res.in, 020 25719223

9. It may be noted that all queries, clarifications, questions etc., relating to this EoI, technical or otherwise, must be only in writing or email, and should be addressed to the nominated point of contact.
10. Requests for clarification may be submitted to the Centre at least 2 days prior to Pre-bid meeting and clarifications for such queries shall be provided by the Centre or its representative in the pre-bid meeting.
11. Bidders should provide their email address in their queries without fail since replies from Centre will be by emails only. The email address and phone/fax numbers of the bidder should also be indicated on the sealed cover.
12. Please Note: This is not a Request for proposal (RFP) and commercials are not to be submitted with this “Expression of Interest”.