

Amendment No.1

Date: 20/12/2013

Subject: Amendment to the Tender Enquiry Document**Ref:Tender Enquiry No.: HLL/PCD/PMSSY/AIIMS-II/02/13-14 dated 02/12/2013**

The pre-bid meeting for the referred tender enquiry was held on 09/12/2013. Based on pre-bid discussions following amendments are being incorporated in the referred tender enquiry document.

Section I
Notice Inviting Tenders(NIT)

(1) For:-

S.No.	Name of Equipment	Quantity per AIIMS	Total Quantity for 6 AIIMS	EMD
7	Colour Doppler (2D & 3D)	2	12	12,00,000

Read as:

S.No.	Name of Equipment	Quantity per AIIMS	Total Quantity for 6 AIIMS	EMD
7(a)	Colour Doppler(2D)	1	6	4,20,000
7(b)	Colour Doppler(3D)	1	6	7,80,000

Section IV
General Conditions of Contract

(1) For:-

21.4: Irrevocable & non – transferable LC shall be opened by the respective consignees.

Read as:

21.4 Irrevocable & non – transferable LC shall be opened by **the purchaser**.

Section VI
List of Requirements

(1) For:-

S.No.	Name of Equipment	Quantity per AIIMS	Total Quantity for 6 AIIMS	Warranty required	CMC required
7	Colour Doppler (2D & 3D)	2	12	5 years	yes

Read as:

S.No.	Name of Equipment	Quantity per AIIMS	Total Quantity for 6 AIIMS	Warranty required	CMC required
7(a)	Colour Doppler(2D)	1	6	5 years	yes
7(b)	Colour Doppler(3D)	1	6	5 years	yes

(2) For:-

Part II: Required Delivery Schedule:

b) For Imported goods directly from foreign:

75 days from the date of opening of L/C. The date of delivery will be the date of Bill of Lading/Airway bill. (Tenderers may quote the earliest delivery period).

Read:

b) For Imported goods directly from foreign:

90 days from the date of opening of L/C. The date of delivery will be the date of Bill of Lading/Airway bill. (Tenderers may quote the earliest delivery period).

Section – VII
Technical Specifications

Schedule No. 1

Technical Specification for a New State of the Art multidetector, multislice (128 rows detector) CT Scanner System on a turnkey basis

1. Existing Specification:

The product offered should be a high end model under current production. The scanner should be capable of comprehensive whole body imaging including cardiac, abdomen, neuro and vascular imaging applications, true isotropic volume acquisition. It should also be capable of 3-D reconstructions at fast speeds, quantitative calcium scoring in the vessels using all documented quantification algorithms, 3-D image display during acquisition on-line as well as real time, 3-D vessel imaging with feasibility for volume rendering.

Read as:

The system quoted should be latest state of art top of the line with the features of latest RSNA (2013 or later) release. The system to be of 128 or more physical rows of detectors with dual energy application. The scanner should be capable of comprehensive whole body imaging including cardiac, abdomen, neuro and vascular imaging applications, true isotropic volume acquisition. It should also be capable of 3-D reconstructions at fast speeds, quantitative calcium scoring in the vessels using all documented quantification algorithms, 3-D image display during acquisition on-line as well as real time, 3-D vessel imaging with feasibility for volume rendering.

2. Existing Specification:

Para 1.c.: The gantry should have a minimum tilt of 30 degrees on either side and remote tilt should be available as standard.

Read as:

Deleted

3. Existing Specification:

Para 1.e.: The sub millimeter Slice @ 0.63 mm or less in **128 rows of detector with 128 acquisitions** should be available. The system should be in position to perform 128 acquisition Slices/ Rotation for general, cardiac/vascular applications.

Read as:

Para 1.e.: The sub millimetre Slice @ 0.63 mm or less in **128 rows or more of detector with 256 or more acquisitions should be available.** The system should be in position to perform

256 acquisition Slices/ Rotation for general, cardiac/vascular applications. (Specify the submillimetre slice thickness in millimetres)

4. Existing Specification:

Para 2.d.: The X ray Tube should be essentially Dual Focus with capacity of at least 7 MHU.

Read as:

Para 2.d.: The X ray Tube should be essentially Dual Focus. **The heat storage capacity should be 7 MHU or equivalent. Specify the method and technique of cooling.**

5. Existing Specification:

Para 3.b.: The **128 acquisition slice per Rotation should be possible with the detectors in 0.63 mm Mode.** The Systems should have at least **128 Physical Rows of the detector.**

Read as:

Para 3.b.: The **256 acquisition slice or more** per Rotation should be possible. The Systems should have at least **128 Physical Rows of the detector or more.**

6. Existing Specification:

Para 4.b.: The Minimum table top height **should not be more than 35 cms** from the floor level for easy transport of trauma patients.

Read as:

Para 4.b.: The Minimum table top height **should not be more than 65cms** from the floor level for easy transport of trauma patients.

7. Existing Specification:

Para 4.c.: The Floating table top width should be **atleast 42 cms** for better comfort.

Read as:

Para 4.c.: The Floating table top width should be **atleast 40 cms** for better comfort.

8. Existing Specification:

Para 6.a.: The system offered should have Spiral Capability of **at least 100 seconds & above.** Real Time Spiral @ 10 f/s should be standard.

Read as:

Para 6.a.: The system offered should have Spiral Capability of **at least 80 seconds & above.** Real Time Spiral @ 10 f/s should be standard.

9. Existing Specification:

Para 6.e.: System should perform Tilt Spiral scan as standard at any of the chosen angles in Multi Slice Mode.

Read as:

Deleted

10. Existing Specification:

Para 6.f.: High Resolution scan package of **0.63 mm or less should be offered as standard**

Read as:

Para 6.f.: **High Resolution scan package should be offered as standard and Specify the minimum slice thickness for which High Resolution scan package is possible.**

11. Existing Specification:

Para 6.g.: Multi Slice CT Fluoroscopy with **at least 3 Slice positions & Reconstruction @ 10 Images/ Sec should be quoted as an optional feature.**

Read as:

Para 6.g.: Multi Slice CT **Fluoroscopy to be quoted as standard. Price should be quoted separately.**

12. Existing Specification:

Para 7.a.: The Computer offered should be the Latest Multi-tasking Processors and a menu driven platform with a RAM size of **at least 8GB.**

Read as:

Para 7.a.: The Computer offered should be the Latest Multi tasking Processors and a menu driven platform with a RAM size of **at least 4GB.**

13. Existing Specification:

Para 7.i.: PC Based connectivity should be standard for easy transfer of Images & Report.

Read as:

Para 7.i.: PC Based connectivity should be standard for easy transfer of Images & Report. **The image transfer from main console to workstation should be automatic and immediate.**

14. Existing Specification:

Para 7.j.: Additional three independent Work stations with thin client server architecture with capability of all 2D & 3D post processing , with at least 8 GB RAM, Archival on DVD / CD with Cardiac Recon, CT Angiography , Colonoscopy as well as DICOM Print should be included in the Scope of Supply.

Read as:

Para 7.j.: **CT should be with a dual monitor console with one workstation having capability of all 2D & 3D post processing , with at least 8 GB RAM, Archival on DVD / CD with Cardiac Recon, CT Angiography , Colonoscopy as well as DICOM Print should be included in the Scope of Supply. Additional thin client server architecture with 3 concurrent licenses having all post processing tools as that of the workstation. The necessary hardware and networking should also be supplied.**

15. Existing Specification:

Para 8.: Image Processing section

- a. The system should have standard software like 3D Volume rendering , MIP,CT angio, color angio Display, Colonoscopy, CT Perfusion , Dental scan , Bone Mineral Study should be available as standard on the **Main console**
- b. The following soft ware should be offered as standard (MPR , ROI , VOLUME CALCULATION , CT NUMBER DISPLAY , WINDOW WIDTH , WINDOW LEVEL , TOPOGRAM DISPLAY , CINE DISPLAY , HRCT LUNG, DYNAMIC SCAN)
- c. Cardiac Scan Attachment with ECG Gated Segmented Recon , Calcium score , Vessel Flythrough of the Coronaries should be available.
- d. Automatic display of MPR Images after scan will be preferred.
- e. Bolus triggered Brain Perfusion CT study (at least 3-level) with automatic CBF, CBV, MTT, TTP maps, ROI placing, comparing ROI, saving maps
- f. Neuro DSA with automatic bone removal software
- g. Dental CT: high-resolution evaluation of teeth and jaws with automatic panoramic and paraxial reconstruction, evaluation of mandibular canal and life size filming.
- h. Fusion CT: fusion of morphological data obtained on CT, MR or DSA.

- i. Lung CT: low dose lung CT protocols for advanced lung nodule detection, assessment and follow-up. Lung segmentation software for nodule detection.
- j. Bone/Osteo CT: for bone mineral density assessment and quantification for metabolic bone diseases.

Read as:

Para 8.: Image Processing section

Cardiology and Oncology post processing tools to be quoted as standard. The post processing tools of the perfusion and others as quoted below to be available in the workstation.

- a. The system should have standard software like 3D Volume rendering , MIP,CT angio, color angio Display, Colonoscopy, CT Perfusion , Dental scan , Bone Mineral Study should be available as standard on the **Workstation**.
- b. The following soft ware should be offered as standard (MPR , ROI , VOLUME CALCULATION , CT NUMBER DISPLAY , WINDOW WIDTH , WINDOW LEVEL , TOPOGRAM DISPLAY , CINE DISPLAY , HRCT LUNG, DYNAMIC SCAN)
- c. Cardiac Scan Attachment with ECG Gated Segmented Recon , Calcium score , Vessel Flythrough of the Coronaries should be available **with software package at workstation and thin client server stations**.
- d. Automatic display of MPR Images after scan will be preferred.
- e. Bolus triggered Brain Perfusion CT study (at least 3-level) with automatic CBF, CBV, MTT, TTP maps, ROI placing, comparing ROI, saving maps
- f. Neuro DSA with automatic bone removal software
- g. Dental CT: high-resolution evaluation of teeth and jaws with automatic panoramic and paraxial reconstruction, evaluation of mandibular canal and life size filming.
- h. Fusion CT: fusion of morphological data obtained on CT, MR or DSA.
- i. Lung CT: low dose lung CT protocols for advanced lung nodule detection, assessment and follow-up. Lung segmentation software for nodule detection.
- j. Bone/Osteo CT: for bone mineral density assessment and quantification for metabolic bone diseases.
- k. Post processing should also have liver segmentation analysis, whole body perfusion, tumor tracking, myocardial assessment.**

16. Existing Specification:

Para.10. Accessories:

- j. Dry chemistry camera of DPI 500 or more of any reputed make.
- k. Lead Glass of **120X 180 cm**.
- l. UPS with half an hour back up to run the entire CT , Computers , Dry chemistry camera, Work Stations etc.
- m. Dual Head Pressure Injector of reputed make with **500 No: Syringes & Tubings**.
- n. Multi Para monitor with pulse oximeter of a reputed make for monitoring vitals
- o. Patient radiation dose should be displayed on the monitor as well as on the films
- p. Zero lead aprons-4 Nos.
- q. Lead apron stand — 1 No.

Read as:

Para.10. Accessories: **(Make and Model of all the quoted accessories should be specified)**

- a) Dry chemistry camera of DPI 500 or more of any reputed make.
- b) Lead Glass of **200 x 100 cm**.
- c) UPS with half an hour back up to run the entire CT, Computers, Dry chemistry camera, Work Stations etc.
- d) Dual Head Pressure Injector of reputed make with **300 sets of Syringes & 1000 sets of tubings. Specify the make of Injector.**

- e) Multi Para monitor with pulse oximeter of a reputed make for monitoring vitals
- f) Patient radiation dose should be displayed on the monitor as well as on the films
- g) Zero lead aprons-4 Nos.
- h) Lead apron stand — 1 No.
- i) **Lead Apron Hanger suitable for the supplied aprons, shields.**
- j) **Thyroid Shields – 4 nos.**
- k) **Gonadal Shields – 4 nos.**
- l) **Tumor ablation system with treatment planning solution & RF generator to be quoted. (Price to be quoted separately).**

Specification as below;

- **Computerized needle positioning guiding tool along with radio frequency ablation system for CT guidance in tumor ablation.**
- **System should support different ablation system.**
- **Registration of the data, post processing segmentation before and after ablation should be possible.**
- **Overlay of non-contrast images with contrast images to be possible.**
- **Should include radio frequency ablation generator with:**
 1. **Frequency atleast 450KHz.**
 2. **To support multiprong electrode and capable of 7cm ablation in one sitting.**
 3. **Temperature range should be 15-125 deg C with steps of 1 deg C.**
 4. **RFA accessories- Intelliflow pump, RFA probes, multiprong electrodes and coaxial biopsy gun of 9cm and 15cm with 20cm throw.**

17. Existing Specification:

Para.14. Certifications:

I. Offered model should be **European CE and US FDA** approved. Copy of certifications should be submitted with bid

Read as:

Para.14. Certifications:

I. Offered model should be **European CE or US FDA** approved. Copy of certifications should be submitted with bid

To be added:

The Turnkey Scope of Work - CT

1. The Supplier should inspect the proposed site offered by the Consignee Institute in which the CT system has to be installed and they are required to submit the plan for the complete CT Scan Centre on a turnkey basis. The scope of work includes complete Civil work, Electrical, Plumbing, Furnishing, Air-conditioning and Fire fighting for the construction of CT Scan Centre.

2. While preparing the plan, the following aspects have to be addressed.

- a) Care should be taken to provide easy negotiation of the patient stretchers/ trolleys through corridors and doors.
- b) Radiation shielding for doors, walls, windows etc.
- c) Furniture like desk, chairs, shelves etc.
- d) Patient stretcher and other furniture/ accessory to make the scan centre functional.

3. ***The cost of Turnkey for the area of 1500 sq.ft and Air-conditioning of Tonnage 15 TR will be considered for Ranking / Evaluation purpose.***

4. Moreover Bidders will have to quote the Unit Rates of the following components of turnkey work.

- a) Civil works
- b) Electrical work
- c) Public health (plumbing and sanitary fittings).
- d) Air Conditioning (HVAC)
- e) Interior Furnishing & Furniture
- f) Miscellaneous

Scope of work for turnkey CT unit works:-

The supplier should inspect the proposed site and submit all the detailed structural and architectural drawings and BOQ for the proposed CT Scan Centres along with technical bid of the tender.

The CT SCAN CENTRE shall consist of the following rooms:

- a. CT Gantry Room
- b. Console room
- c. Equipment room
- d. Patient preparation room
- e. Reporting room
- f. Patient waiting area
- g. Radiologist room

The actual area of turnkey works done will be considered for payment, based on the site measurements.

Civil work

- a) Civil construction work including construction of brick wall if any, plastering, flooring as per the approved plan and equipment layout plan.
- b) Concrete bed at CT equipment area.
- c) Platform for unloading and shifting the CT should be provided if necessary.
- d) Cable tray, trench & channel – necessary trenches, cable tray and channels at required location would be provided.
- e) All the construction work to be done as per the final plan approved by the Consignee.
- f) Active and passive room shielding for magnetic, fringe field should be provided as per the requirement of the equipment.

a) Flooring

1. 600 x 600 mm vitrified tiles with 100mm tile skirting to match in console room, lobby and patient preparation areas, Radiologist room etc.
2. 50 mm thick cement concrete flooring with Vinyl flooring in CT equipment / UPS room.

b) Painting

1. Two coats Plastic Emulsion Paint over 2 coats of wall putty including primer in patient preparation area, Lobby area, console room, CT Gantry & Equipment room etc.

c) False Ceiling

1. Acoustical tile for ceiling with light weight insulating material of high quality supported on grid or finished seamless with support above ceiling. Finished with white paint or powder coated with white paint, if metallic. Ceiling height to suit the equipment mount and clearances.

Plumbing work

1. All water pipes and fittings shall be of high density polythene of approved and standard make. The gratings shall be brass chrome plated. All plumbing accessories should be of standard make.
2. Hot water service to be provided if required.

Electrical work

1. The supplier shall be required to specify the total load requirements for the CT scan centre including the load of air conditioning , room lighting and for the accessories if any. The supply line will be provided by the Institute up to one point within the CT Scan centre area. The distribution panel shall be provided by the vendor. Few lights in each room shall be connected to the UPS to provide emergency lighting.
2. The electrical work shall include the following:
 - a. Wiring – All interior electrical wiring- with main distribution panel board, necessary MCBs, DB, joint box, switch box etc. the wires shall be of copper of different capacity as per the load and should be renowned make as listed below.
 - b. Switches light and power points should be of modular type and of standard make as listed below.
 - c. General lights – Mirror optical type 1X28 W or 2X28 W/CFL fittings 2X36, 3X36 W with electronic ballasts

3. AIR CONDITIONING:

Ductable package air conditioners and split AC units may be used according to room requirement and suitability. Humidity control should be effective to eliminate moisture condensation on equipment surface. The Air conditioning should be designed with standby provision to function 24 hours a day.

The outdoor units of AC should have grill coverings to prevent theft and damage.

Ventilation is required in toilet.

2. Environment specifications:

- a) a) Humidity range: Relative humidity 60% and 80% in all areas except equipment room which shall be as per requirement of the equipment.
- b) b) Temperature ranges: $22 \pm 2^{\circ}$ C in all areas except equipment room which shall be as per requirement of the equipment.
- c) c) Air conditioning load: The heat load calculations and maintaining the desired temperature and humidity shall be the responsibility of the bidder.

Furniture:

- a) Revolving chairs height adjustable, medium-back with hand-rest in the Control room, Radiologist room and viewing area. – **4 NO.S**
- b) Chairs for patient waiting area – Three seater (chrome plated). - **10 NO.S**
- c) Cupboard with laminate door shutters for storage of spare parts and accessories and records as per requirement. – **3 NO.S**
- d) Drug trolleys 1 numbers for patient preparation area.
- e) Patient trolley with rubber foam mattress to be kept in the patient preparation room.
- f) Name boards for all rooms
- g) Tables for Workstation and Radiologist in reporting room.- **2 NO.S**
- h) Changing rooms should have change lockers and dressing table.
- i) Dustbins (plastic with lid) to be provided as required.
- j) Any other furniture item as per requirement.

All furniture items should be of standard make as mentioned in the table below.

Miscellaneous:

1. Reporting room should have LED X-ray Film viewer with adjustable brightness ; capable of holding 3 films of 14”x17” size. – **2 no.s**
2. Cabling of Network (LAN) connectivity for camera system, console system, workstation and computers etc.
3. Broadband connection: for REMOTE SERVICE of CT system.
4. Fire extinguisher Dry CO2 type as required for the building safety.

LIST OF ITEMS AND SUGGESTED MANUFACTURERS.

SL NO	ITEMS	PREFERRED MAKES
A	FLOORING VITRIFIED TILES	Somany, Kajaria , H&R Johnson, RAK india
B	PAINT	Dulux, Asian Paints , Nerolac
C	PLUMBING	Kohler, Jaguar , Grohe , Roca
D	SANITARY ITEMS	CERA, Hindware, Parryware
E	ELECTRICAL	
1	CABLES	Finolex, Havells ,V-Guard
2	SWITCHES	Legrand, L&T, Crabtree , Roma
3	DISTRIBUTION BOX , MCB	Legrand, L&T, Siemens, Havels
4	LIGHT FITTINGS	Philips / Crompton / Kesselec-Schreder / Wipro.
F	AIR CONDINTIONING	Daikin, Hitachi, Blue Star, Voltas,
G	FURNITURE	Hermen Miller , Godrej , Featherlite

Schedule no. 2

Technical specification of a new, state of the art, 3T MRI scanner

1. Existing Specification:

RF SYSTEM

A fully digital RF system capable of transmitting power of at least **single 25 KW** with a combination of RF power amplifiers. System should be capable of Multi Transmit with Multi amplifier driving /true shape for better **B0 homogeneity**.

Read as:

RF SYSTEM

A fully digital RF system capable of transmitting power of at least **25 KW or more (Single/ dual)** with a combination of RF power amplifiers. System should be capable of Multi Transmit with Multi amplifier driving /true shape for better **B1 homogeneity**

2. Existing Specification:

RF COILS

32 Channels or more head coil- phased array for cranial application including paediatric head.

Neck phased array coil-8 channel or more

Neuro vascular coil. In case above two coils do not suffice in combination for complete Neuro -vascular study Aortic arch to Circle of Willis, please quote separate coil in addition to above two coils for this study.

Spine phased array coil for thoracic and lumbar spine imaging{16 channel or more} Maximum achievable FOV should be mentioned NV coil should be combinable with The spine coil to provide complete coverage of brain and spine without repositioning the patient Phased array Body coil with 32 channels, or more, capable of doing whole abdomen, pelvic (prostate. rectum and cervix), MRCP etc. The coil should cover the heart, abdomen and pelvis. in case this is not available additional coils and packages to cover at-least 48cm FOV on Z axis should be given. Please specify the time reduction factor with PAT.

Two loop Flex coil (large and small)-- for imaging of regions such as shoulder, wrist.

Suitable coil for peripheral angiography applications (kindly quote as optional)

Dedicated carotid coil with suitable adapter for imaging both carotids at the same time(optional item)

High resolution knee and ankle coils: 8 channel or more

Breast coil-7Channel or more to be offered

Dedicate Phased array coil for the faster and high resolution cardiac imaging.

Vendor should offer multi coil acquisition In order to optimize throughput increase and increased effective FOV.

Read as:

- a) **32 channel or more head coil.**
- b) **Neck phased array 8 channel of more**
- c) **Neurovascular coil of 16 channels or more**
- d) **Spine phased array coil 32 channels or more**
- e) **Body phased array coils 32 channels of more (single or in combination)**
- f) **Coil for peripheral angiography 32 channels or more as standard**
- g) **Dedicated Carotid coil (Price to be quoted separately)**
- h) **Breast coil 7 channel or more**
- i) **Dedicated Phased array coil for faster and high resolution Cardiac imaging – 32 channels or more; The 31 Phosphorus spectroscopy also to be possible. (Price to be quoted separately)**

- j) **Shoulder coil – Multi channel (8 channels or more) flex or rigid type – 2nos. (One large and one small)**
- k) **High resolution knee coil 12 channel or more**
- l) **High resolution foot/ ankle coil – 8 channel or more**
- m) **Multi Nuclear Spectroscopy coil(¹H, ³¹P, ²³Na, ¹³C) for Head and Liver as standard.**

3. Existing Specification:

Para 6.: Patient Table:

Table should be detachable /detachable table top with trolley

Read as:

Deleted

4. Existing Specification:

Para 7: COMPUTER SYSTEM IMAGE PROCESSOR / OPERATOR CONSOLE

One color console for acquisition. all calculations, post processing etc Console must have **full colour touch screen** with user define protocols with programmable inter scan delay

Read as:

Para 7: COMPUTER SYSTEM IMAGE PROCESSOR / OPERATOR CONSOLE

One color console for acquisition, all calculations, post processing etc Console must have full colour with user define protocols with programmable inter scan delay

5. Existing Specification:

Para 8: WORKSTATION

Two independent multimodality work station like Advantage Windows/Syngo ViaNiew forum with 18" or more TFT/LCD monitor with dual exam processor with at least 8 GB RAM, separate hard disk with image storage of at least 2.5 lacs images in 256 x 256 matrix with CDRW or DVDRW. DICOM-3.0 compatibility and interfacing with other modalities should be possible.

Read as:

One workstation with post processing tools as specified with thin client servers and 5 concurrent licences capable of similar post processing. Necessary hardware to be included with 18" or more TFT/LCD monitor with dual exam processor with at least 8 GB RAM, separate hard disk with image storage of at least 2.5 lacs images in 256 x 256 matrix with CDRW or DVDRW. DICOM-3.0 compatibility and interfacing with other modalities should be possible.

6. Existing Specification:

Para 8: WORKSTATION

Two independent multimodality work station like Advantage Windows/Syngo ViaNiew forum with 18" or more TFT/LCD monitor with dual exam processor with at least 8 GB RAM, separate hard disk with image storage of at least 2.5 lacs images in 256 x 256 matrix with CDRW or DVDRW. DICOM-3.0 compatibility and interfacing with other modalities should be possible.

Read as:

One workstation with post processing tools as specified with thin client servers and 5 concurrent licences capable of similar post processing. Necessary hardware to be included with 18" or more TFT/LCD monitor with dual exam processor with at least 8 GB RAM, separate hard disk with image storage of at least 2.5 lacs images in 256 x 256 matrix with CDRW or DVDRW. DICOM-3.0 compatibility and interfacing with other modalities should be possible.

7. Existing Specification:

Para 8: WORKSTATION

It should have software for tumour vascular properties like IAUC, KEP, Ktrans. Workstation should be able to view CT, MR, PET, US, Xray Images

Read as:

Kindly mention whether software for vascular properties like IAUC, KEP is available. DSA images should be viewable in Subtraction mode.

8. Existing Specification:

Para 8: WORKSTATION

The workstation should have display of Cardiac cine images in movie mode with rapid are creation and should have comprehensive cardiac post processing software including for coronary MRA with regular free upgrades in future. Calculation of ventricular area and volume, stroke volume, ejection fraction and relative ejection fraction. Time volume diagram generation, filling rates and myocardial wall motion. Graphic display of output calculation of flow and velocity parameter with colour coded display of velocity parameters.

It should have necessary and adequate hardware and software for sending and receiving the patient data{text + images}.

Printing of films should be possible from both main console and workstation.

Workstation should also be able to function independent of the main console. **This each Workstation should have remote access capability to connect 3 additional windows based computers for image review.** These 6 windows based computer should be provided with LAN connectivity for 100 meters

Read as:

Para 8: WORKSTATION

The workstation should have display of Cardiac cine images in movie mode with rapid are creation and should have comprehensive cardiac post processing software including for coronary MRA with regular free upgrades in future. Calculation of ventricular area and volume, stroke volume, ejection fraction and relative ejection fraction. Time volume diagram generation, filling rates and myocardial wall motion. Graphic display of output calculation of flow and velocity parameter with colour coded display of velocity parameters. **(Price to be quoted separately)**

It should have necessary and adequate hardware and software for sending and receiving the patient data{text + images}.

Printing of films should be possible from both main console and workstation.

Workstation should also be able to function independent of the main console. These 6 windows based computer should be provided with LAN connectivity for 100 meters

9. Existing Specification:

Para.:9 DATA ACQUISITION

Graphic prescription.

Read as:

Para.:9 DATA ACQUISITION

Deleted

10. Added under Para: 10 EPI MODE

BOLD, SWI, T₂ Perfusion (with all post processing licences as standard)

Complete Functional MRI of Brain package as standard (incl. of patient camera, goggles etc)

11. Added under Para 10: IMAGING SEQUENCES

MRS: Proton (¹H) MRS- Single voxel (SV), Multi-voxel CSI -2D and 3D- in both short and long TE

Multi nuclear – ³¹P, ²³Na and ¹³C with compatible necessary hardware.

Iron, Elastography Cartilage – Standard

12. Existing Specification

Para 10: Imaging Sequences

Contrast kinematics like **TWIST/TRICKS/4DTRACKS** should be offered

Color T2 mapping of cartilage should be offered as optional.

Image fusion should be offered

Whole body imaging of 200 cm should be offered

Programming environment under research agreement should be offered for creating and modifying pulse sequences and working on the system.

Flow quantification in vessels and CSF, hepatobiliary system.

MRI neurofunctional imaging sequence including BOLD/ Mosaic etc.

Optimized breath hold sequences for abdominal studies including angiogram.

Sequence package for functional mapping of brain.

Internal ear imaging. 3D acquisitions like **CUBE. SPACE, 4D VISTA** to be quoted as standard.

Susceptibility Weighted imaging should be provided as essential.

Zoom RF Focussed Imaging like Zoom IT / FOCUS /equivalent should be provided

Non Contrast perfusion Imaging software like ASL and its post processing should be offered

MR Cholangiography and Pancreatogram: Both breath-hold and respiratory triggered - Specialized sequences and processing to perform MRCP.

Pulmonary 2D/3D MRA sequence, including single breath hold sequence.

MR ventriculography and cisternography, Myelography.

Parallel acquisition technique such as SENSE/SMASH/ASSET/iPAT, ARC and other new sequences to be quoted as standard.

Specify the factor by which the acquisition time is reduced for similar acquisition with and with out parallel imaging technique. A scan time reduction factor 4 for head, body, cardiac, angio and ortho application is required.

Flow quantification packages for CSF with dynamic CSF flow imaging, aqueduct. and spinal canal In-line motion correction for uncooperative' patients/pediatric applications, that is motions/patient movement correction sequence and algorithm (not just faster scanning or parallel imaging techniques) for non-cooperative/sick patients/children should be provided.

Read as:

Para 10: Imaging Sequences

Contrast kinematics like **TWIST/TRICKS/TRACKS** should be offered

Color T2 mapping of cartilage should be offered as optional.

Image fusion should be offered

Whole body imaging of 200 cm should be offered

Programming environment under research agreement should be offered for creating and modifying pulse sequences and working on the system.

Flow quantification in vessels and CSF, hepatobiliary system.

MRI neurofunctional imaging sequence including BOLD/ Mosaic etc.

Optimized breath hold sequences for abdominal studies including angiogram.

Sequence package for functional mapping of brain.

Internal ear imaging. 3D acquisitions like **CUBE. SPACE, VISTA** to be quoted as standard.

Susceptibility Weighted imaging should be provided as essential.

Zoom RF Focussed Imaging for clinical application of high SNR even in small FOV should be available. Specify the details (The smallest FOV and the technique)

Non Contrast perfusion Imaging software like ASL and its post processing should be offered

MR Cholangiography and Pancreatogram: Both breath-hold and respiratory triggered - Specialized sequences and processing to perform MRCP.

Pulmonary 2D/3D MRA sequence, including single breath hold sequence.

MR ventriculography and cisternography, Myelography.

Parallel acquisition technique such as SENSE/SMASH/ASSET/iPAT, ARC and other new sequences to be quoted as standard.

Specify the factor by which the acquisition time is reduced for similar acquisition with and without parallel imaging technique. A scan time reduction factor 4 for head, body, cardiac, angio and ortho application is required.

Flow quantification packages for CSF with dynamic CSF flow imaging, aqueduct. and spinal canal In-line motion correction for uncooperative' patients/pediatric applications, that is motions/patient movement correction sequence and algorithm (not just faster scanning or parallel imaging techniques) for non-cooperative/sick patients/children should be provided.

Specify availability of Automatic planning, scanning and post processing.

13. Existing Specification:

Para 16: ACCESSORIES-

Storage box for all coils

Must have independent dual Syringe Pressure injector with following Features; Non-ferrous, automatic syringe size detection, performs single/dual phase contrast injections, provides Saline flush delivery and allows timed contrast delivery Must be compatible with 10, 15, 20 & 30ml pre-filled contrast syringes and 50 ml syringes for both saline & contrast **(200 Nos of 50 ml Syringes with connectors should be provided)** Must be able to observe progress of injection and view injection result

MRI Compatible ECG leads and Pulse oximeter

MRI Compatible Anesthesia Machine with integrated Ventilator, 2 vaporiser, circle absorber

Non magnetic IV stand.

Two non-magnetic patient transfer trolleys should be provided

Metal detectors three in number, two of which are hand held.

Phantoms to be provided for regular QA studies.

Complete manuals and other necessary documentation's should be provided.

Read as:

Para 16: ACCESSORIES-

Storage box for all coils

Must have independent dual Syringe Pressure injector with following Features; Non-ferrous, automatic syringe size detection, performs single/dual phase contrast injections, provides Saline flush delivery and allows timed contrast delivery Must be compatible with 10, 15, 20 & 30ml pre-filled contrast syringes and 50 ml syringes for both saline & contrast **(200 Nos of 50 ml Syringes with 500 nos. of tube connectors should be provided)** Must be able to observe progress of injection and view injection result

MRI Compatible ECG leads (1000 nos.) and Pulse oximeter

MRI Compatible Anesthesia Machine with integrated Ventilator, 2 vaporiser, circle absorber

- a) **Capable of ventilating adult, pediatric and neonates.**
- b) **Soft ware for ventilation should support Volume control, Pressure control and Pressure support modes.**
- c) **Should have oxygen, nitrous oxide and air flow meters**
- d) **Isoflurane and sevoflurane vaporisers**
- e) **All safety alarms**
- f) **MRI Compatible 2 sets of laryngoscope :4 sizes blades- Neonatal, paediatrics, adult, extra large.**
- g) **MRI compatible Magill forceps : Adult & paediatric size- Two each.**
- h) **Stylet for endotracheal tube : Ault, paediatric size- Three each**
- i) **MRI compatible Clamps 2 Nos : Either towel clip or artery forceps.**

- j) **MRI Compatible two IV stands. (if not provided already)**
 - k) **MRI compatible suction apparatus - 2 Nos**
 - l) **Two Anesthesia bed/trolley for recovery.**
 - m) **One MRI compatible monitor in MRI Room and One Slave monitor in console room with following modules provision to monitor –**
 - **Heart rate**
 - **ECG**
 - **NIBP – Size of Cuffs (adult & pediatric neonatal)**
 - **Respiration (Capnograph)**
 - **Two IBP – Pressure transducer with the MRI compatible stand.**
 - **Oxygen saturation – Pulse oximeter with adult, pediatric probe, and neonatal probes - 2 sets (with the spare probes), Should have plethysmograph perfusion factor.**
 - **ETCO2 and ETAA (end tidal anesthetic agents)**
 - **Temperature (adult and pediatric)**
- MRI compatible infusion pump – 3 Nos.**
- Arrangement of Gas lines in recovery room and magnet room – MRI compatible high pressure gas outlet for**
- **Oxygen**
 - **Air**
 - **Nitrous Oxide with MRI compatible indexed system.**
 - **Vaccum suction**

Non magnetic IV stand.

Two non-magnetic patient transfer trolleys should be provided

Metal detectors three in number, two of which are hand held.

Phantoms to be provided for regular QA studies.

Complete manuals and other necessary documentation's should be provided.

To be added:

The Turnkey Scope of Work - MRI

1. The Supplier should inspect the proposed site offered by the Consignee Institute in which the MRI system has to be installed and they are required to submit the plan for the complete MRI Scan Centre on a turnkey basis. The scope of work includes complete Civil work, Electrical, Plumbing, Furnishing, Air-conditioning and Fire fighting for the construction of MRI Scan Centre.
2. While preparing the plan, the following aspects have to be addressed.
 - e) Care should be taken to provide easy negotiation of the patient stretchers/ trolleys through corridors and doors.
 - f) RF shielding for doors, walls, glass viewer etc.
 - g) Furniture like desk, chairs, shelves etc.
 - h) Patient stretcher and other furniture/ accessory to make the scan centre functional.
3. ***The cost of Turnkey for the area of 1500sq.ft and Air-conditioning of Tonnage 15 TR will be considered for Ranking / Evaluation purpose.***
4. Moreover Bidders will have to quote the Unit Rates of the following components of turnkey work.
 - a) Civil works
 - b) Electrical work
 - c) Public health (plumbing and sanitary fittings).

- d) Air Conditioning (HVAC)
- e) Interior Furnishing & Furniture
- f) Miscellaneous

Scope of work for turnkey MRI unit works:-

The supplier should inspect the proposed site and submit all the detailed structural and architectural drawings and BOQ for the proposed MRI Scan Centres along with technical bid of the tender.

The MRI SCAN CENTRE shall consist of the following rooms:

- a. MRI Room
- b. Console room
- c. Equipment room
- d. Patient preparation room
- e. Reporting room
- f. Patient waiting area
- g. Radiologist room

The actual area of turnkey works done will be considered for payment, based on the site measurements.

Civil work

- a) Civil construction work including construction of brick wall, plastering, flooring as per the approved plan and equipment layout plan.
- b) Concrete bed at MRI equipment area.
- c) Platform for unloading and shifting the MRI should be provided if necessary.
- d) Platform for Chiller unit would be provided. Fencing and weather protection facility should be provided for the Chiller unit.
- e) Cable tray, trench & channel – necessary trenches, cable tray and channels at required location would be provided.
- f) All the construction work to be done as per the final plan approved by the purchaser.
- g) Active and passive room shielding for magnetic, fringe field should be provided as per the requirement of the equipment.

a) Flooring

- 3. 600 x 600 mm vitrified tiles with 100mm tile skirting to match in console room, lobby and patient preparation areas, Radiologist room etc.
- 4. 50 mm thick cement concrete flooring with Vinyl flooring in MRI equipment / UPS room.

b) Painting

- 2. Two coats Plastic Emulsion Paint over 2 coats of wall putty including primer in patient preparation area, Lobby area, console room, MRI equipment room etc.
- 3. Pre laminated particleboard wall panelling in MRI examination room

c) False Ceiling

2. Acoustical tile for ceiling with light weight insulating material of high quality supported on grid or finished seamless with support above ceiling. Finished with white paint or powder coated with white paint, if metallic. Ceiling height to suit the equipment mount and clearances.

Plumbing work

1. All water pipes and fittings shall be of high density polythene of approved and standard make. The gratings shall be brass chrome plated. All plumbing accessories should be of standard make.
2. Copper pipes to be used for plumbing the Chiller to the MRI.

Electrical work

1. The supplier shall be required to specify the total load requirements for the MRI scan centre including the load of air conditioning , room lighting and for the accessories if any. The supply line will be provided by the Institute up to one point within the MRI Scan centre area. The distribution panel shall be provided by the vendor. Few lights in each room shall be connected to the UPS to provide emergency lighting.
3. The electrical work shall include the following:
 - a) Wiring – All interior electrical wiring- with main distribution panel board, necessary MCBs, DB, joint box, switch box etc. the wires shall be of copper of different capacity as per the load and should be renowned make as listed below.
 - b) Switches light and power points should be of modular type and of standard make as listed below.
 - c) General lights – Mirror optical type 1X28 W or 2X28 W/CFL fittings 2X36, 3X36 W with electronic ballasts.
 - d) MRI compatible lights for MRI examination room. The bulbs used within the RF cage should be easy replaceable and locally available.

AIR CONDITIONING:

Ductable package air conditioners and split AC units may be used according to room requirement and suitability. Humidity control should be effective to eliminate moisture condensation on equipment surface. . The Air conditioning should be designed with standby provision to function 24 hours a day.

The outdoor units of AC should have grill coverings to prevent theft and damage.

Ventilation is required in toilet.

Environment specifications:

- a) Humidity range: Relative humidity 60% and 80% in all areas except equipment room which shall be as per requirement of the equipment.
- b) Temperature ranges: $22 \pm 2^{\circ}$ C in all areas except equipment room which shall be as per requirement of the equipment.

- c) Air conditioning load: The heat load calculations and maintaining the desired temperature and humidity shall be the responsibility of the bidder

Furniture:

- a) Revolving chairs height adjustable, medium-back with hand-rest in the Control room, Radiologist room and viewing area. – **4 NO.S**
- b) Chairs for patient waiting area – Three seater (chrome plated). - **10 NO.S**
- c) Cupboard with laminate door shutters for storage of spare parts and accessories and records as per requirement. – **3 NO.S**
- d) Drug trolleys for patient preparation area.- **1 NO.**
- e) Patient trolley with rubber foam mattress to be kept in the patient preparation room.
- f) Name boards for all rooms
- g) Tables for Workstation and Radiologist in reporting room.- **2 NO.S**
- h) Changing rooms should have change lockers and dressing table.
- i) Dustbins (plastic with lid) to be provided as required.
- j) Any other furniture item as per requirement.

All furniture items should be of standard make as mentioned in the table below.

Miscellaneous:

- Reporting room should have LED X-ray Film viewer with adjustable brightness; capable of holding 3 films of 14”x17” size. – **2 no.s**
- Cabling of Network (LAN) connectivity for camera system, console system, workstation and computers etc.
- Broadband connection: for REMOTE SERVICE of MRI system.
- Fire extinguisher Dry CO2 type as required for the building safety.

LIST OF ITEMS AND SUGGESTED MANUFACTURERS.

SL No	ITEMS	PREFERRED MAKES
A	FLOORING VITRIFIED TILES	Somany, Kajaria , H&R Johnson, RAK india
B	PAINT	Dulux, Asian Paints , Nerolac
C	PLUMBING	Kohler, Jaguar , Grohe , Roca
D	SANITARY ITEMS	CERA, Hindware, Parryware
E	ELECTRICAL	
1	CABLES	Finolex, Havells ,V-Guard
2	SWITCHES	Legrand, L&T, Crabtree , Roma
3	DISTRIBUTION BOX , MCB	Legrand, L&T, Siemens, Havels
4	LIGHT FITTINGS	Philips / Crompton / Kesselec-Schreder / Wipro.
F	AIR CONDINTIONING	Daikin, Hitachi, Blue Star, Voltas,
G	FURNITURE	Hermen Miller , Godrej , Featherlite

Schedule no. 3

TECHNICAL SPECIFICATIONS FOR BIPLANE D.S.A WITH ACCESSORIES

1. Existing Specification:

The system should be the latest state of the art equipment with essential features as mentioned below.
The Unit should comprise the following

Read as:

The system should be the state of the art model to be quoted with feature equivalent to the latest model launched at RSNA 2013 or later.

2. Existing Specification:

Para: Patient Table: B. 3. The table should have a trendelenburg tilt facility at least 10 degree.

Read as:

Para: Patient Table: B. 3. **The table with trendelenberg tilt facility would be preferred.**

3. Existing Specification:

Para: D. X-Ray Tubes:

- i) 1.0 mm or less with load 80 KW or more.
- ii) **0.3 mm** or less with load 15 KW or more. (smaller focal spot tubes will be preferred)

Read as:

Para: D. X-Ray Tubes:

- i) 1.0 mm or less with load 80 KW or more **in minimum one plane.**
- ii) **0.5 mm** or less with load 15 KW or more **in minimum one plane.**

4. Existing Specification:

Para: E. 3. The collimator leaf should have **IRIS type** arrangement.

Read as:

Para: E. 3. The collimator leaf should have **IRIS/rectangular type** arrangement.

5. Existing Specification:

Para: F. Biplane Digital System:

6. Three monitors of at least 19" size TFT/LCD for each plane for display of live, reference and subtracted image with high resolution flicker free display should be provided. Monitors should have anti-glare provision. **(Price to be quoted separately)**

7. Similarly 4 monitors, two for each plane (live & reference image) with high resolution display in the control room should be provided. **(Price to be quoted separately)**

Read as:

Para: F. Biplane Digital System:

6. Three monitors of at least 19" size TFT/LCD for each plane for display of live, reference and subtracted image with high resolution flicker free display should be provided. Monitors should have anti-glare provision.

7. Similarly 4 monitors, two for each plane (live & reference image) with high resolution display in the control room should be provided.

- Console Monitor for patient registration.

- Physiology monitor in examination room and in console with the requisite computer system for NIBP, IBP, SpO₂ measurement, display and analysis.

5. Existing Specification:

Para: G. Digital Imaging System and essential softwares:

11. Archiving on a CD/DVD recorder should be provided. **Juke box/RAID** and 5000 CD's R/W or 1000 DVD should be supplied with the unit (**Prices to be quoted separately**).

12. An additional workstation for processing of the DSA images and their documentation should be provided in addition to 3D workstation.

This workstation should have the facility to reconstruct the long leg view for peripheral images (**Prices to be quoted separately**).

14. Bolus chase software should be provided. (**Prices to be quoted separately**).

16. Specify the time limit minimum 30 seconds for uninterrupted acquisition of on-line subtracted images at 1024 x 1024 matrix with maximum frame rate. **Minimum 25 second should be available.**

Read as:

Para: G. Digital Imaging System and essential softwares:

11. Archiving on a CD/DVD recorder should be provided. **Juke box/RAID (4TB)** and 5000 CD's R/W or 1000 DVD should be supplied with the unit

12. An additional workstation for processing of the DSA images and their documentation should be provided in addition to 3D workstation.

This workstation should have the facility to reconstruct the long leg view for peripheral images.

14. Bolus chase software should be provided.

16. Specify the time limit minimum 30 seconds for uninterrupted acquisition of on-line subtracted images at 1024 x 1024 matrix with maximum frame rate.

6. Existing Specification:

Para: H. Essential accessories:

2. Pressure injector of reputed make along with **4 reusable and 200 disposable syringes** sets.

6. Lead gown as per the following specifications: **6 Nos.**

11. Lead protected viewing glass.

13. Anaesthesia workstation.

Read as:

Para: H. Essential accessories:

2. Pressure injector of reputed make along with **500 disposable syringes** sets.

6. Lead gown as per the following specifications: **8 Nos.**

11. Lead protected viewing glass (Size: 200cm X 100cm)

13. Anaesthesia workstation with ventilator.

To be added:

The Turnkey Scope of Work – Biplane D.S.A

1. The Supplier should inspect the proposed site offered by the Consignee Institute in which the DR system has to be installed and they are required to submit the plan for the complete DR Centre on a turnkey basis. The scope of work includes complete Civil work, Electrical, Plumbing, Furnishing, Air-conditioning and Fire fighting for the construction of DR Centre.

2. While preparing the plan, the following aspects have to be addressed.

- a) Care should be taken to provide easy negotiation of the patient stretchers/ trolleys through corridors and doors.
- b) Radiation shielding for doors, walls, windows etc.
- c) Furniture like desk, chairs, shelves etc.
- d) Patient stretcher and other furniture/ accessory to make the DR centre functional.

3. ***The cost of Turnkey for the area of 1500 sq.ft and Air-conditioning of Tonnage 15 TR will be considered for Ranking / Evaluation purpose.***

4. Moreover Bidders will have to quote the Unit Rates of the following components of turnkey work.

- a) Civil works
- b) Electrical work
- c) Public health (plumbing and sanitary fittings).
- d) Air Conditioning (HVAC)
- e) Interior Furnishing & Furniture
- f) Miscellaneous

To be added:

Scope of work for turnkey Biplane D.S.A system:

The supplier should inspect the proposed site and submit all the detailed structural and architectural drawings and BOQ for the proposed DR Centres along with technical bid of the tender.

The Biplane D.S.A site shall consist of the following rooms:

- a. Biplane D.S.A Room
- b. Console room
- c. Equipment room
- d. Patient preparation room
- e. Change room
- f. Patient waiting area
- g. Radiologist room

The actual area of turnkey works done will be considered for payment, based on the site measurements.

Civil work

- a) Civil construction work including construction of brick wall if any, plastering, flooring as per the approved plan and equipment layout plan.
- b) Concrete bed at Biplane DSA equipment area.
- c) Platform for unloading and shifting the Biplane DSA should be provided if necessary.
- d) Cable tray, trench & channel – necessary trenches, cable tray and channels at required location would be provided.
- e) All the construction work to be done as per the final plan approved by the Consignee.

a) Flooring

- 1. 600 x 600 mm vitrified tiles with 100mm tile skirting to match in console room, lobby and patient preparation areas, Radiologist room etc.
- 2. 50 mm thick cement concrete flooring with Vinyl flooring in Biplane DSA equipment / UPS room.

b) Painting

- 1. Two coats Plastic Emulsion Paint over 2 coats of wall putty including primer in patient preparation area, Lobby area, console room, Biplane DSA room & Equipment room etc.

c) False Ceiling

- 1. Acoustical tile for ceiling with light weight insulating material of high quality supported on grid or finished seamless with support above ceiling. Finished with white paint or powder coated with white paint, if metallic. Ceiling height to suit the equipment mount and clearances.

Plumbing work

3. All water pipes and fittings shall be of high density polythene of approved and standard make. The gratings shall be brass chrome plated. All plumbing accessories should be of standard make.

Electrical work

4. The supplier shall be required to specify the total load requirements for the Biplane DSA centre including the load of air conditioning , room lighting and for the accessories if any. The supply line will be provided by the Institute up to one point within the Biplane DSA centre . The distribution panel shall be provided by the vendor. Few lights in each room shall be connected to the UPS to provide emergency lighting.
5. The electrical work shall include the following:
 - a. Wiring – All interior electrical wiring- with main distribution panel board, necessary MCBs, DB, joint box, switch box etc. the wires shall be of copper of different capacity as per the load and should be renowned make as listed below.
 - b. Switches light and power points should be of modular type and of standard make as listed below.
 - c. General lights – Mirror optical type 1X28 W or 2X28 W/CFL fittings 2X36, 3X36 W with electronic ballasts

6. AIR CONDITIONING:

Ductable package air conditioners and split AC units may be used according to room requirement and suitability. Humidity control should be effective to eliminate moisture condensation on equipment surface. The Air conditioning should be designed with standby provision to function 24 hours a day.

The outdoor units of AC should have grill coverings to prevent theft and damage.

Ventilation is required in toilet.

2. Environment specifications:

- a) Humidity range: Relative humidity 60% and 80% in all areas except equipment room which shall be as per requirement of the equipment.
- b) Temperature ranges: 22 + 2° C in all areas except equipment room which shall be as per requirement of the equipment.
- c) Air conditioning load: The heat load calculations and maintaining the desired temperature and humidity shall be the responsibility of the bidder.

Furniture:

- a) Revolving chairs height adjustable, medium-back with hand-rest in the Control room, Radiologist room and viewing area. – **4 NO.S**

- b) Chairs for patient waiting area – Three seater (chrome plated). - **10 NO.S**
- c) Wall mounted shelves for catheter and other procedural hardware – **4 Nos.**
- d) Cupboard with laminate door shutters for storage of spare parts and accessories and records as per requirement. – **3 NO.S**
- e) Drug trolleys 1 numbers for patient preparation area.
- f) Patient trolley with rubber foam mattress to be kept in the patient preparation room.
- g) Name boards for all rooms
- h) Tables for Workstation and Radiologist in reporting room.- **2 NO.S**
- i) Changing rooms should have change lockers and dressing table.
- j) Dustbins (plastic with lid) to be provided as required.
- k) Any other furniture item as per requirement.

All furniture items should be of standard make as mentioned in the table below.

Miscellaneous:

- i. Knee controlled hand free two station scrub unit with disinfectant/ soap dispenser.
- ii. Reporting room should have LED X-ray Film viewer with adjustable brightness; capable of holding 3 films of 14”x17” size. – **2 no.s**
- iii. Cabling of Network (LAN) connectivity for camera system, console system, workstation and computers etc.
- iv. Broadband connection: for REMOTE SERVICE of Biplane DSA system.
- v. Fire extinguisher Dry CO2 type as required for the building safety.

LIST OF ITEMS AND SUGGESTED MANUFACTURERS.

SL NO	ITEMS	PREFERRED MAKES
A	FLOORING VITRIFIED TILES	Somany, Kajaria , H&R Johnson, RAK india
B	PAINT	Dulux, Asian Paints , Nerolac
C	PLUMBING	Kohler, Jaguar , Grohe , Roca
D	SANITARY ITEMS	CERA, Hindware, Parryware
E	ELECTRICAL	
1	CABLES	Finolex, Havells ,V-Guard
2	SWITCHES	Legrand, L&T, Crabtree , Roma
3	DISTRIBUTION BOX , MCB	Legrand, L&T, Siemens, Havels
4	LIGHT FITTINGS	Philips / Crompton / Kesselec-Schreder / Wipro.
F	AIR CONDINTIONING	Daikin, Hitachi, Blue Star, Voltas,
G	FURNITURE	Hermen Miller , Godrej , Featherlite

Schedule no. 4

SPECIFICATION FOR 1000 mA X-RAY UNIT WITH DIGITAL FLAT PANEL DETECTOR (On Turn-Key Basis)

1. **Existing Specification:**

A High powered X-Ray Unit for general radiography with digital flat panel technology. The system should be capable of both erect and supine radiological examinations. The unit should be completely integrated with the following specifications. **The X-Ray Generator and Tube should be from the same manufacturer.**

Read as:

A High powered X-Ray Unit for general radiography with digital flat panel technology. The system should be capable of both erect and supine radiological examinations. The unit should be completely integrated with the following specifications. **Any two components out of three (X-Ray tube, X-ray Generator and Flat panel detectors) should be from the same manufacturer of the main (Complete) system**

2. **Existing Specification:**

Para 2. VIII. Preview time after exposure **5 sec or less**

Read as:

Para 2. VIII. Preview time after exposure **7 sec or less**

3. **Existing Specification:**

Para 3. I. **Microprocessor controlled high frequency(100 kHz or more) X-Ray Generator should be of latest technology with constant output with low ripple frequency**

Read as:

Para 3. I. **X-ray generator should be of microprocessor controlled high frequency (mention the frequency) type with latest technology having constant output with low ripple frequency.**

4. **Existing Specification:**

Para 4.III. Please mention tube loading for small focus and large focus, should be atleast **40KW** for small focus and at least 80KW for large focus

Read as:

Para 4.III. Please mention tube loading for small focus and large focus, should be atleast **30KW or more** for small focus and at least 80KW for large focus

5. **Added Para to 9. Operating (Acquisition) Station:**

System should have latest processor with 4GB or more RAM and 2TB or more storage capacity

6. **Existing Specification:**

Para: 10. IX Image stitching software to be provided.

Read as:

Para: 10. IX Image stitching software **and the necessary hardware** to be provided.

7. **Existing Specification:**

Para 14. The bidder should provide **USFDA, European CE** approved and AERB approved certificate for machine. Please enclose any other certificate required for installation of the machine. NOC will not be accepted.

Read as:

Para 14. The bidder should provide **USFDA or European CE approved** and AERB approved certificate for machine. Please enclose any other certificate required for installation of the machine. NOC will not be accepted.

To be added:

The Turnkey Scope of Work - DR

1. The Supplier should inspect the proposed site offered by the Consignee Institute in which the DR system has to be installed and they are required to submit the plan for the complete DR Centre on a turnkey basis. The scope of work includes complete Civil work, Electrical, Plumbing, Furnishing, Air-conditioning and Fire fighting for the construction of DR Centre.

2. While preparing the plan, the following aspects have to be addressed.

- i. Care should be taken to provide easy negotiation of the patient stretchers/ trolleys through corridors and doors.
- ii. Radiation shielding for doors, walls, windows etc.
- iii. Furniture like desk, chairs, shelves etc.
- iv. Patient stretcher and other furniture/ accessory to make the DR centre functional.

3. ***The cost of Turnkey for the area of 1500 sq.ft and Air-conditioning of Tonnage 15 TR will be considered for Ranking / Evaluation purpose.***

4. Moreover Bidders will have to quote the Unit Rates of the following components of turnkey work.

- a) Civil works
- b) Electrical work
- c) Public health (plumbing and sanitary fittings).
- d) Air Conditioning (HVAC)
- e) Interior Furnishing & Furniture
- f) Miscellaneous

Scope of work for turnkey DR system:

The supplier should inspect the proposed site and submit all the detailed structural and architectural drawings and BOQ for the proposed DR Centres along with technical bid of the tender.

The DR CENTRE shall consist of the following rooms:

- a. DR Room
- b. Console room
- c. Equipment room
- d. Patient preparation room
- e. Reporting room
- f. Patient waiting area
- g. Radiologist room

The actual area of turnkey works done will be considered for payment, based on the site measurements.

Civil work

- a) Civil construction work including construction of brick wall if any, plastering, flooring as per the approved plan and equipment layout plan.
- b) Concrete bed at DR equipment area.
- c) Platform for unloading and shifting the DR should be provided if necessary.
- d) Cable tray, trench & channel – necessary trenches, cable tray and channels at required location would be provided.
- e) All the construction work to be done as per the final plan approved by the Consignee.

a) Flooring

1. 600 x 600 mm vitrified tiles with 100mm tile skirting to match in console room, lobby and patient preparation areas, Radiologist room etc.
2. 50 mm thick cement concrete flooring with Vinyl flooring in DR equipment / UPS room.

b) Painting

1. Two coats Plastic Emulsion Paint over 2 coats of wall putty including primer in patient preparation area, Lobby area, console room, DR room & Equipment room etc.

c) False Ceiling

1. Acoustical tile for ceiling with light weight insulating material of high quality supported on grid or finished seamless with support above ceiling. Finished with white paint or powder coated with white paint, if metallic. Ceiling height to suit the equipment mount and clearances.

Plumbing work

1. All water pipes and fittings shall be of high density polythene of approved and standard make. The gratings shall be brass chrome plated. All plumbing accessories should be of standard make.

Electrical work

1. The supplier shall be required to specify the total load requirements for the DR centre including the load of air conditioning , room lighting and for the accessories if any. The supply line will be provided by the Institute up to one point within the DR centre . The distribution panel shall be provided by the vendor. Few lights in each room shall be connected to the UPS to provide emergency lighting.
2. The electrical work shall include the following:
 - a. Wiring – All interior electrical wiring- with main distribution panel board, necessary MCBs, DB, joint box, switch box etc. the wires shall be of copper of different capacity as per the load and should be renowned make as listed below.
 - b. Switches light and power points should be of modular type and of standard make as listed below.

- c. General lights – Mirror optical type 1X28 W or 2X28 W/CFL fittings 2X36, 3X36 W with electronic ballasts

3. AIR CONDITIONING:

Ductable package air conditioners and split AC units may be used according to room requirement and suitability. Humidity control should be effective to eliminate moisture condensation on equipment surface. The Air conditioning should be designed with standby provision to function 24 hours a day.

The outdoor units of AC should have grill coverings to prevent theft and damage.

Ventilation is required in toilet.

2. Environment specifications:

- d) a) Humidity range: Relative humidity 60% and 80% in all areas except equipment room which shall be as per requirement of the equipment.
- e) b) Temperature ranges: $22 \pm 2^{\circ}$ C in all areas except equipment room which shall be as per requirement of the equipment.
- f) c) Air conditioning load: The heat load calculations and maintaining the desired temperature and humidity shall be the responsibility of the bidder.

Furniture:

- a) Revolving chairs height adjustable, medium-back with hand-rest in the Control room, Radiologist room and viewing area. – **4 NO.S**
- b) Chairs for patient waiting area – Three seater (chrome plated). - **10 NO.S**
- c) Cupboard with laminate door shutters for storage of spare parts and accessories and records as per requirement. – **3 NO.S**
- d) Drug trolleys 1 numbers for patient preparation area.
- e) Patient trolley with rubber foam mattress to be kept in the patient preparation room.
- f) Name boards for all rooms
- g) Tables for Workstation and Radiologist in reporting room.- **2 NO.S**
- h) Changing rooms should have change lockers and dressing table.
- i) Dustbins (plastic with lid) to be provided as required.
- j) Any other furniture item as per requirement.

All furniture items should be of standard make as mentioned in the table below.

Miscellaneous:

1. Reporting room should have LED X-ray Film viewer with adjustable brightness ; capable of holding 3 films of 14"x17" size. – **2 no.s**
2. Cabling of Network (LAN) connectivity for camera system, console system, workstation and computers etc.
3. Broadband connection: for REMOTE SERVICE of DR system.
4. Fire extinguisher Dry CO2 type as required for the building safety.

LIST OF ITEMS AND SUGGESTED MANUFACTURERS.

SL NO	ITEMS	PREFERRED MAKES
A	FLOORING VITRIFIED TILES	Somany, Kajaria , H&R Johnson, RAK india
B	PAINT	Dulux, Asian Paints , Nerolac
C	PLUMBING	Kohler, Jaguar , Grohe , Roca
D	SANITARY ITEMS	CERA, Hindware, Parryware
E	ELECTRICAL	
1	CABLES	Finolex, Havells ,V-Guard
2	SWITCHES	Legrand, L&T, Crabtree , Roma
3	DISTRIBUTION BOX , MCB	Legrand, L&T, Siemens, Havels
4	LIGHT FITTINGS	Philips / Crompton / Kesselec-Schreder / Wipro.
F	AIR CONDINTIONING	Daikin, Hitachi, Blue Star, Voltas,
G	FURNITURE	Hermen Miller , Godrej , Featherlite

Schedule no. 5**Tender Specifications for one Digital Flat Panel Fluoroscopy cum Radiography System****1. Existing Paragraph:**

High powered X-Ray unit with digital flat panel for various fluoroscopy and radiography examinations for the department of Radio-diagnosis. **The X-Ray Tube and X- ray generator should be from the same principal manufacturer.**

Read as:

High powered X-Ray unit with digital flat panel for various fluoroscopy and radiography examinations for the department of Radio-diagnosis. **Any two components out of three (X-Ray Tube, X- ray generator and Flat panel detector) should be from the same principal manufacturer of the main (complete) system.**

2. Existing Paragraph:**Para: Table**

System should have motor **driven longitudinal and horizontal table top movements**. Please specify the range of movements.

Table should have angulations from longitudinal to head down positions. (Vertical+90 degrees to **Trendelenbrug-20 degrees**)

Table should support patient weight upto200kgs

Read as:

System should have motor driven **longitudinal, vertical and horizontal table top movements or Imaging chain movements**. Please specify the range of movements.

Table should have angulations from longitudinal to head down positions.(Vertical+90 degrees to **Trendelenbrug-90 degrees**)

Table should support patient weight upto200kgs without any restriction of table movement.

3. Added under Para Table:

Table should have provision for lateral imaging, without patient movement.

4. Existing Paragraph:

Para: X ray Tube:

Anode heat storage capacity should be **700 KHU or more**.

Read as:

Para: X ray Tube:

Anode heat storage capacity should be **600 KHU or more**.

5. Existing Paragraph:

Para: Detector System:

Single Digital flat panel detector, using **selenium detector** with TFT convertor.

Read as:

Para: Detector System:

Single Digital flat panel detector, using **Selenium/Cesium Iodide detector** with TFT convertor.

6. Existing Paragraph:

Para: Image display system

Monochrome monitors of 19" to be provided in examination and console rooms with resolution of 1 Mega pixel or more.

Read as:

Para: Image display system

Dual Monochrome monitors (2 nos) of 19" to be provided one in examination and other in console room with resolution of 1 Mega pixel or more. Specify monitors are wall mounted or trolley mounted.

7. Existing Paragraph:

Para: Image storage and Transmission

Image storage capacity of at least **30,000 images** in 1024 x 1024 matrix at 10 / 12 bits on the main system disk.

Read as:

Para: Image storage and Transmission

Image storage capacity of at least **8,000 images** in 1024 x 1024 matrix at 10 / 12 bits on the main system disk.

8. Existing Paragraph:

Para: vi. Suitable UPS with complete back up for the computer system for at least 30minutes.

Read as:

Para: vi. **Suitable UPS with 140KVA for complete system for at least 30minutes back up.**

9. Added under Para Installation:

Lead lining and other radiation protection measures provided by bidder in the site should be AERB compliant.

10. Existing Paragraph:

Para: Essential certificate

Radiation safety certificate: The offered model must have a valid NOC and AERB type approved certificate at the time of submission of tender.

Quality certification: **CE (Europe)& USA FDA.**

Read as:

Para: Essential certificate

Radiation safety certificate: The offered model must have a valid AERB type approved certificate at the time of submission of tender. NOC certificate from AERB will not be considered.

Quality certification: **CE (Europe) or USA FDA.**

Schedule no. 7
Specifications for Colour Doppler(2D and 3D)

The existing technical specification may be read as two different schedules as follows:

Schedule no. 7 (a)
Specifications for colour Doppler (2d)

2D Color Doppler Ultrasound Equipment

The equipment must be capable of operating in B, M, Doppler, Color flow and Power Doppler modes. It must support transducers with linear, sector and convex formats. Further, it must include a full array of measurement and calculation packages. The specific minimum requirements for this equipment are as follow.

1 User Interface & Ergonomics

- 1.1 The system shall support backlight keys or provide an integrated light for ease of use in darkened work areas. The backlighting shall be tri-state to further simplify ease of use and indicate function selected.
- 1.2 The system shall include at least a 17" LCD monitor to allow for both excellent images viewing as well as providing for workflow and productivity features.
- 1.3 The system shall have three active universal probe ports in a convenient, easy to access location to maximize the availability of needed probes.

2. Productivity

- 2.1 The system shall offer an extended field-of-view imaging that operates by sweeping a transducer over the anatomy of interest. This mode shall build the extended field-of-view in a real-time manner, showing the image as it builds.
- 2.2 System shall have image management features that store images by patient and include the ability to review images from different exam dates.
- 2.3 **System shall support the ability of post image acquisition optimization to optimize imaging** parameters such as B Gain, TGC, Color Gain, Dynamic Range, Speckle Reduction levels, Doppler Gain, Doppler Base Line on image recalled from the image archive.
- 2.4 System shall allow for live image and archive images side-by-side or quad display on a single monitor. This display shall allow any type of image – B-Mode, Color, or power Doppler on either side.
- 2.5 The system shall display thumbnails on a clipboard while scanning to facilitate exams.

3. Unit should have Auto IMT (Intima media thickness measurement) facility.

4. Unit should have Ultrasound Contrast imaging capability (Micro bubbles). **Tissue Harmonic imaging with contrast should be available as standard feature.**

5. Post-acquisition Data Processing.

5.1 The system shall allow for post-storage image manipulation to provide maximum image flexibility, review and productivity. It shall include, at a minimum the ability to change the:

- Overall B-Mode gain, dynamic range and gray scale maps.
- Overall Doppler gain, base line shift, sweep speed and inverted spectral waveform.
- 3D reconstruction from a stored 2D CINE-loop.

5.2 The system shall provide a display zoom function on frozen images.

6 Scanning Parameters

6.1 The system shall possess the ability to control speckle through the use of a speckle reduction (SRI) algorithm that enhances borders, reduces speckle artifact and improves detail and contrast resolution in gray scale with compatibility in Color mode, 3D and side-by-side display. This feature shall have operator selectable settings and be capable of displaying in side-by-side mode with non-speckle reduced image.

6.2 The system shall provide the ability to scan in the compound imaging mode with multiple lines on all linear and convex probes.

The system shall provide scan depths from a minimum of 2 cm to a maximum of at least 30 cm.

6.3 System should have minimum of 17,000 Digital Channels for better resolution.

6.4 System should have Dynamic Range of **at least 170 Db.**

7 M-Mode Imaging

The system shall have a facility allowing the M-Mode cursor to be adjustable in any plane and allow for accurate measurements. The M-mode shall be available from a CINE loop or live image.

8 Spectral Doppler (PW)

8.1 Doppler mode shall be available on all probes.

8.2 The Doppler cursor shall be user-steerable with linear transducers.

8.3 The system shall provide the user with control to either have Doppler with real time B-Mode, Doppler with periodic B-Mode update or Doppler with frozen B-Mode scanning.

8.4 The system shall provide stereo audio of the Doppler spectral signal.

8.5 The system shall provide the user with control during timeline replay to review the spectrum only (i.e., frozen B-Mode) or with the spectrum and B-Mode together and synchronized.

8.6 The system shall provide the user with the ability to add a spectral peak and spectral mean trace onto the spectrum in both real time or after freezing the image.

9 Measurements and Calculations

9.1 The system shall provide digital calipers for at least the following measurements:

- a. Depth & Distance
- b. Circumference
- c. Area
- d. Volume
- e. Velocity

9.2 All measurements should be possible on frozen images as well as on images recalled from the image archive.

9.3 The system shall provide a comprehensive set of obstetrical and gynecologic calculations and vascular calculations with summary reports.

10. Unit should have integrated 3D Imaging facility using Normal probes for MULTIPLANAR views and surface rendering as well as vascular 3D capabilities for Gray scale, Color Mode and also power Doppler. System is capable of capturing 3 dimensional data from parallel and sweep movements.

11. Image Archive and Networking

11.1 The device should store images onto an integrated DVD-R Multiridrive and a USB port storage device.

11.2 The system shall include at least 100 GB bytes of dedicated hard drive for large local storage capacity.

12 DICOM Connectivity should be a standard feature with the hospital network and a standalone PC (Windows based) with suitable DICOM viewer to be supplied.

13 Transducers

- a. Transvaginal Probe , Operating Frequency 4- 9 MHz
- b. Convex Probe with biopsy attachment. Operating Frequency: **2 - 5 MHz**
- c. Linear Probe with biopsy attachment. Operating Frequency: 5 – 10 MHz
- d. Sector probe 2-5 MHz

14 Deleted

15 The unit must be US FDA and CE approved.

16 Suitable UPS with 60 minute backup for whole system.

17. Patient couch with compatible ergonomic operator chair of premium quality. .(Price to be quoted separately)

18. Gel warmer (stand alone)- 01 No.

19. The bidder has to arrange for demonstration of the quoted model.

Schedule no. 7 (b)
Specifications for colour doppler (3D)

High End 3D Color Doppler Equipment – 1 no

The equipment must be capable of operating in B, M, Doppler, Color flow and Power Doppler modes, Contrast microbubble ultrasound & 3D / 4D Volume Scanning capabilities.

It should support transducers with linear, sector and convex formats. Further, it must include a full array of measurement and calculation packages. The specific minimum requirements for this equipment are as follow.

1 User Interface & Ergonomics

- 1.1 The keyboard should have Height adjustment. The adjustment should also include Keyboard rotation Side to Side.
- 1.2 The system shall support backlight keys or provide an integrated light for ease of use in darkened work areas. The backlighting shall simplify ease of use and indicate function selected.
- 1.3 The system shall include at least a 19" LCD monitor for both excellent image viewing as well as providing for workflow and productivity features.
- 1.4 The LCD monitor shall be mounted on an articulating arm that moves side-to-side, forward and backward.
- 1.5 The unit shall have **gel warmer as attachment** for the comfort of the patient.
- 1.6 The system shall include a minimum 7 inch LCD with context sensitive menus to facilitate productivity as well as minimize training requirements.
- 1.7 The system shall have minimum Four active probe Ports in a convenient, easy to access location to maximize the availability of needed probes.

2. Productivity

- 2.1 The system shall offer an extended field-of-view imaging that operates by sweeping a transducer over the anatomy of interest. This mode shall build the extended field-of-view in a real-time manner, showing the image as it builds.
- 2.2 System shall have image management features that store images by patient and include the ability to review images from different exam dates.
- 2.3 System shall support the ability to store digital data in, that allows to optimize imaging arameters such as B Gain, TGC, Color Gain, Dynamic Range, Speckle Reduction levels, Doppler Gain, Doppler Base Line on old Images & old loops recalled from the image archive.
- 2.4 System shall allow for live image and archive images side-by-side or quad display on a single monitor. This display shall allow any type of image – B-Mode, Color, or power Doppler on either side.

3. Workflow

3.1 The system shall implement a feature, which enables to help streamlining the workflow. In particular the system should automatically invoke the correct mode and imaging parameter and advance to the next step within the examination with a one-button operation.

4 Realtime 3D / 4D Imaging Capabilities

5 Elastography should be available in convex, Linear and whole body convex Probe.

6 Contrast Ultrasound Capability (CEUS) with Times Intensity Curve Graphs.

7 Blood flow visualization Technique /Mode should be available , which should be independent of velocity and angle that displays the Blood flow echoes in gray scale imaging, with different intensities according to reflectors Speed and Dynamics.

8 Data Processing.

8.1 The system shall allow for Post-Storage image manipulation to provide maximum image flexibility, review and productivity. It shall include the ability to change all following on recalled old Stored Images/Loops :

- a. Overall B-Mode gain, dynamic range and gray scale maps.
- b. Overall Doppler gain, base line shift, sweep speed and inverted spectral waveform.
- c. 3D reconstruction from a stored 2D CINE-loop.
- d. Anatomical M-Mode

8.2 The system shall provide a display zoom function on frozen images.

9 Scanning Parameters

9.1 The system should have minimum **65,000 digital system processing channels**.

9.2 The system shall possess the ability to control speckle through the use of a speckle reduction algorithm that enhances borders, reduces speckle artifact and improves detail and contrast resolution in gray scale with compatibility in Color mode, 3D and side-by-side display. This feature shall have operator selectable settings and be capable of displaying in side-by-side mode with non-speckle reduced image.

9.3 The system shall provide the ability to scan in the compound imaging mode with up to 9 lines on all linear and convex probes.

9.4 The system shall provide scan depths from a minimum of 2 cm to a maximum of at least 30 cm.

10 B-Mode/ M-Mode Imaging

The system shall provide the capability for coded tissue harmonic imaging on all offered transducers.

The system shall have an —anatomical|| M-Mode – allowing the M-Mode cursor to be adjustable in any plane and allow for accurate measurements.

11 Color flow/Power Doppler

12 Spectral Doppler (PW)

13 Measurements and Calculations

13.1 Measurements should be possible on frozen images as well as on images recalled from the image archive.

13.2 The system shall provide a comprehensive set of obstetrical and gynecologic calculations and vascular calculations with summary reports.

14 Image Archive and Networking

14.1 The device should store images onto an integrated DVD-R Multiridrive and a USB port storage device.

14.2 The system shall include at least **500 GB hard drive** for large local storage capacity.

14.3 The device should store images in DICOM, JPG, WMV and AVI formats for maximum flexibility.

15 DICOM Connectivity

15.1 The system shall support as an option for DICOM service classes:

16 Transducers

- a. Convex, **with biopsy attachment**. Operating Frequency: 2 - 5 MHz
 - b. Linear, **with biopsy attachment**. Operating Frequency: 5 – 10 MHz
 - c. **TCD Sector probe**.
 - d. Trans-vaginal Probe, Frequency 3-11 MHz
 - e. 4D Volume Convex Probe (**To be quoted as standard**)
 - f. **Pediatric micro convex probe for neurosonogram**.
17. Suitable UPS for a 60 minute backup **for whole system**.
18. **The system should be USFDA or European CE certified**.
19. **System upgradability option should be available for Fusion/ Navigation**.
20. **Patient couch with 6 way movement and ergonomic operator chair.(Price to be quoted separately)**
21. **The bidder has to arrange for demonstration of the quoted model**.

Schedule no. 8 **Specifications for portable ultrasound and colour doppler unit**

1. Added Para:

A portable USG Doppler unit to be quoted with the latest model. This machine should be capable and will be required to function clinically as standalone systems in case of high patient throughput during trauma and catastrophic situation.

2. Existing Specification:

Para: 4. Minimum grey scale resolution to be 256 with **1024 or more digital processing channels**.

Read as:

Para: 4. Minimum grey scale resolution to be 256 with **128 or more digital processing channels**.

3. Added under Para 8. Transducers (one each):

3. Endocavitary probe (5-12MHz) with 140 deg FOV

4. Existing Specification:

Para: 9. All transducers should be lightweight digital phased array broadband type transducers with **at least 1024 elements**.

Read as:

Para: 9. All transducers should be lightweight digital broadband type transducers with **128 elements or more**.

5. Existing Specification:

Para: 10. The system should have a frame rate of **at least 600 frames per second (fps) in B mode and more than 300 fps in /Colour mode**.

Read as:

Para: 10. The system should have a frame rate of **at least 300 frames per second (fps) in B mode**.

6. Existing Specification:

Para: 12. The System must have integrated high – resolution TFT/LCD/Single monitor of **10 Inches** or more.

Read as:

Para: 12. The System must have integrated high – resolution TFT/LCD/Single monitor of **15” Inches** or more. **(This is needed for clinical application so that it will be used as standalone during high patient load during routine hours and catering to trauma/ catastrophe.)**

7. Existing Specification:

Para: 15. Imaging modes of Real time 2D, Colour Doppler, Pulsed wave Doppler and Power (energy) Doppler should be available.

Read as:

Para: 15. Imaging modes of Real time 2D, Colour Doppler, Pulsed wave Doppler and Power (energy) Doppler, Tissue Harmonic Imaging with contrast to be quoted as standard feature.

Added Para:

34. Demonstration of the quoted model is must.

Schedule no. 9
Specifications for a High End Computed Radiography Unit

1. Existing Specification:

Para 3.: Identification Station & processing server

a) **The processing station must have 2GB RAM, at least 2x 500 GB HDD in RAID configuration and 19 inch clinical grade monitor.**

Read as:

Para 3.: Identification Station & processing server

a) **The main console must have 4GB or more RAM, and 1 TB Hard Drive and 19 inch clinical grade monitor. The work station should have RAID configuration Hard Disk and 19” monitor.**

2. Existing Specification:

Para 9.: The unit should be **FDA and CE** approved for mammography.

Read as:

Para 9.: The unit should be **US FDA or European CE** approved for mammography.

Schedule no. 10

Digital mammography system with stereotactic biopsy

1. Existing Specification:

General description:

4. Dual track mammography X-ray tube with additional beam filters and automatic collimator

Read as:

General description:

4. Single track dual focus mammography X-ray tube with additional beam filters and automatic collimator

2. Existing Specification:

TECHNICAL SPECIFICATIONS

Para 1. X-Ray Generator

3.0 kw or more generator power

mAs range: 0 to 500

Read as:

TECHNICAL SPECIFICATIONS

Para 1. X-Ray Generator

5.0 kw or more generator power

mAs range: 3 to 500

3. Existing Specification:

TECHNICAL SPECIFICATIONS

Para 2. X-Ray tube

Dual focus x-ray tube preferably Mo/Rh spot size small focal spot: 0.1 mm

Spot size large focal spot: 0.3 mm

Rotating Anode

Anode heat storage capacity >300 kHU

Anode heat dissipation: 40 kHU/min

Beam filters: Mo and Rh

Target/ filter combinations Mo/Mo and Mo/Rh

Target/filter combination Rh/Rh

Tube heat monitoring system / device/ program

Tube current large focal spot (25-30kV): -100 mA

Tube current small focal spot (25-30 kV): 40 mA

Read as:

TECHNICAL SPECIFICATIONS

Para 2. X-Ray tube

Dual focus x-ray tube with small focal spot: 0.1 mm

Spot size large focal spot: 0.3 mm

Rotating Anode

Anode heat storage capacity >150 kHU or more

Anode heat dissipation: 40 kHU/min

Beam or Target filter materials: mention the materials used.

Tube heat monitoring system / device/ program

Tube current large focal spot (25-30kV): -100 mA

Tube current small focal spot (25-30 kV): 40 mA

4. Existing Specification:

Para 3. Gantry assembly

Source to image receptor distance (SID) : 66 cm

Read as:

Para 3. Gantry assembly

Source to image receptor distance (SID) : 62 cm or better

5. Existing Specification:

Para 3. Gantry assembly

Square spot sliding compression paddle

Round spot sliding compression paddle

Read as:

Spot sliding compression paddle

6. Existing Specification:

Para 7. Flat panel detector

Detector size:- 24 x30 cm

Pixel size: 100 um

Read as:

Para 7. Flat panel detector

Specify detector material (Amorphous Se or others) and detector type (Direct or independent type)

Detector size:- 24 x30 cm

Pixel size: 100 um or less

7. Existing Specification:

Para 12. Accessories included

Pair of dual foot pedals

Radiation shield with 0,3 mm Pb equivalent at 49 kV

Face shield

Large paddle- 24x31cm

19x23 cm sliding paddle

Square spot sliding compression paddle

Round spot sliding compression paddle

Remote service modem

Quality control toolkit

User manual and technical documentation

UPS for power supply & backup of 60 minutes.

Read as:

Para 12. Accessories included

Pair of dual foot pedals

Radiation shield with 0,3 mm Pb equivalent at 49 kV

Face shield

Large paddle- 24x31cm

19x23 cm sliding paddle

Spot sliding compression paddle

Remote service modem

Quality control toolkit

User manual and technical documentation

UPS for power supply & backup of 60 minutes.

8. Existing Specification:

Para 13. Display workstation

Multi-modality viewer to display U/S, DX,MR,MG,NM,PET & CT

Read as:

Para 13. Display workstation

Multi-modality viewer to integrate with PACS and to view DICOM images from other modalities.

9. Added under Para 13: Display workstation:

Dry view camera: 500 DPI or more.

10. Existing Specification:

Para 14. FFD based stereotaxy Unit

Digital stereo tactic breast biopsy

System should be patient comfort, efficient, accurate in upright/ Recumbent position with good image quality Stereotaxy angle should be -150 and +150 automatic stop at stereotaxy angles

Tube parking position should be available up to -330 and + 330 for easy access to the breast biopsy procedure Biopsy window should be 50x40 mm or more

Positioning at any angle +/-90 deg should be available

Decubitus Biopsy table for patient positioning during stereotaxy procedure

Read as:

Para 14. FFD based stereotaxy Unit

Biopsy table for patient positioning during stereotaxy in Decubitus or prone position. It must have motorised longitudinal, transverse and vertical movements. It should also have locking facility. Mention the type of detector used for stereotaxy biopsy. Table should be FDA/ CE approved.

11. Existing Specification:

Para 15. CAD Solutions-

CAD solution should be FDA approved.

Read as:

Para 15. CAD Solutions-

CAD solution should be FDA/ European CE approved. Kindly confirm availability of Breast Density Assessment software

12. Existing Specification:

Para 16: Optional (please quote for optional items)

System should be upgradable to tomosynthesis

System should be available / upgradable to contrast enhanced mammography

Read as:

Para 16:

System should have tomosynthesis as a standard. Attach catalogue of tomosynthesis product data and images.

System should be available / upgradable to contrast enhanced mammography

13. Added Para:

Para 17: System should be upgradeable to contrast enhanced mammography.

All other terms and conditions of the tender enquiry remain unaltered.