

Notice Inviting e-Tender

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SUPPLY OF 4 DIMENSIONAL COMPUTER TOMOGRAPHY SIMULATOR MACHINE IN THE HOSPITALS OF THE GOVERNMENT OF WEST BENGAL.

(Submission of Bid through *online*)

Bid Reference No.: WBMSCL /NIT- 05 /2017

Dated –16.01.2018

(2nd call of Tender Reference No. WBMSCL /NIT- 113/2017, Dated-08.12.2017)

Amendment -I

TECHNICAL SPECIFICATIONS

4 DIMENSIONAL COMPUTER TOMOGRAPHY SIMULATOR MACHINE DEDICATED FOR RADIATION THERAPY PLANNING

Dedicated CT Simulator is required for Radiotherapy Department for Conventional Simulation, 3-D CRT, IMRT, IGRT, VMAT, and SRS, SRT & SBRT Planning. The CT-Simulator **should be of latest model and version and** is required for most accurate simulation, placement of treatment fields and marking of radiation field portals on the patient's skin for radiation therapy of cancer patients.

GENERAL SPECIFICATION:

- 1) The CT machine will be used for simulation for radiotherapy treatment and the sections taken with the CT machine will be exported to the dedicated Treatment Planning Systems through DICOM 3 and DICOM RT formats.
- 2) **The System should have the TYPE APPROVAL CERTIFICATE for the quoted model from AERB/BARC (copy should be attached) and should fulfill all recommendations of AERB/BARC regarding radiation safety, FDA and CE mark.**

A bidder who has, on the date of publication of the tender notice, already applied for Type Approval certificate of the offered model to AERB may also be provisionally allowed to participate in the tender. The bidder in that case must

submit the Type Approval certificate latest by the date of Physical inspection and functional demonstration of the offered equipment, failing which the provisional bid submitted by the bidder may be liable to be rejected.

- 3) The CT scanner should be a wide bore (80 cm or more) spiral, multi-slice (16 acquired slices or more), should ensure easy, error free and total compatibility between the scanner and simulation work station.
- 4) **The Radiotherapy Simulation tools should be integrated to the Oncology Information System, 3DTPS for 3D CRT, IMRT/IGRT, SRS and with portal imaging (including CBCT) workstation of the Linear accelerators console and HDR Brachy therapy of the department and this will be entirely and direct responsibility of the vendor. For this the vendor shall be solely responsible for providing all necessary hardware and / or software solutions required.**
- 5) The CT Simulator should have Carbon fiber tabletop with indexing facilities for conformal and stereotactic procedures (for all kinds of immobilization systems used in radiotherapy) **identical to that of linear accelerators in the department.** QA Phantom holder, water level phantom and laser calibration bar should be provided.
- 6) In addition to the gantry mounted LASERS, the CT simulator should have at least three LASER sets for marking the field reference points, consists of a single overhead moving laser to project the sagittal plane, two moving LASERS to project coronal plane and two moving LASERS to project the axial plane. This should eliminate the need for manual couch movements.

TECHNICAL SPEICIFICATION:

The detailed specifications are as follows:

1. CT Scanner

Whole body wide bore spiral, multi-slice (minimum 16 acquired slices or more per rotation) latest model C.T. scanner system under current production & of Slip Ring Spiral Technology should be provided. Refurbished units will not be accepted. The model should have following essential features:

1. A. Gantry:

- i) Gantry aperture should be at least 80 cm or more.
- ii) Gantry tilt should be at least ± 30 degree.
- iii) Scan field of view of at least 50 cm or more.

- iv) Extended field of view for radiotherapy planning should be available. Details to be specified.
- v) The gantry must have 3D laser positioning lights with a positioning accuracy of ± 1 mm or better.
- vi) The Minimum scan time for a 360 Degree rotation – 0.5 second or less
- vii) The gantry should be provided with User control panels on either side for easy positioning
- viii) The slice thickness should be users selectable starting from 1mm or less to 10mm.
- ix) Metal free scanable range should be 150 cm or more

1. B. Patient Couch:

- i) The scanning couch top must be carbon fibre (completely metal free) flat table top having horizontal moving range of **150 cm or more** and **should be compatible with the tables of the linear accelerators installed in the department.** The table should have patient positioning index system on carbon fiber tabletop.
- ii) The accuracy (reproducibility) of the table top must be better than ± 0.25 mm.
- iii) The scannable horizontal range should be at least 150 cm or more.
- iv) The table should be able to bear weight up to 180 kg or more without any change in stated performance specification.
- v) Remote UP/DOWN, FORWARD/BACKWARD motion - to be provided

1. C. CONTROL CONSOLE:

- i) It should have at least one 19" or more (flat panel) medical grade colour monitor for display of 1024 X 1024 matrix or more.
- ii) All functions viz scanning, image reconstruction, film documentation, MPR, CT maximum intensity projection, 3D with SSD etc. should be possible from main console and workstation.
- iii) The following software should be offered as standard (MPR, ROI, VOLUME CALCULATION, CT NUMBER DISPLAY, WINDOW WIDTH, WINDOW LEVEL, TOPOGRAM DISPLAY, CINE DISPLAY, ETC).
- iv) MOD/DVD/CD/USB or better archiving facility must be available.

- v) The image reconstruction should be in real time. Slice thickness should be 1 mm or less and upto 10 mm freely selectable.
- vi) High Contrast Spatial Resolution should be 15 lines pair per cm or better maximum at 0% MTF X-Y axis with Spiral and Axial mode scans.
- vii) The low contrast resolution for CATPHAN should be at least 5mm at 0.3% with 10 mm slice on 20 CATPHAN
- viii) Dose reduction; Pre-patient collimation to reduce unnecessary dose to the patient and Radiation dose calculation and display during the procedure should be available on the system. There should be inbuilt pediatric protocols adapted to weight and / or age. Specify the available mechanism to reduce the effective patient dose.
- ix) Maximal image storage with appropriate matrix size (uncompressed or better) with latest configuration to be provided. Specify details.

1. D. X-RAY SYSTEM:

X-ray generator

- i) High frequency, with power output of 80 kW or more to support continuous and sustained operation.
- ii) Continuous spiral capacity to be mentioned.
- iii) Specify mA at small and large focal spots/ specify information regarding focal spots.

X-ray tube

- i) This should be in the range of 80 kV to 140 kV or better.
- ii) Tube current range should be 20-500 mA with step size of 5 mA or better or specify if different
- iii) Anode heat storage capacity – 5MHU or more and should support provided mA range as specified in clause ii) above. In case, any bidder offer tube with less MHU but having very high heat dissipation rate will also be considered subject to the fact that the output of the machine in terms of uninterrupted exposure time should suffice the purpose as envisaged with a tube having 5 MHU heat storage capacity.
- iv) Peak Anode heat dissipation rate of at least 700 kHU / min or better

- v) X-ray tube should have dual focal spot. Please mention the number and size of the focal spots. Smaller size is preferable.

1. E. DETECTORS:

- i) The detector system should be a high performance, low noise, high data density, and should have active response data acquisition system.
- ii) The detectors should be solid state, preferably of rare earth material. Please give details.
- iii) It should be free from repeated calibrations.
- iv) There should be 20 or more number of rows of 650 or more detectors for taking a minimum of sixteen slices at a time. Higher number of detector elements/per row will be highly preferable. The detector should be able to acquire at least 16slice/per rotation.

1. F. CT SCANNING PARAMETERS:

- i) The slice thickness should be users selectable starting from 1mm or less to 10mm.
- ii) Scan time for full 360 degree rotation should be 0.5 sec. or less.
- iii) Scan field view should be 50 cm or more.
- iv) It must be possible to obtain the scanogram from AP or PA or left to right or right to left directions
- v) Single continuous spiral-on-time should be minimum 100 seconds or more and at least 1000 mm long.
- vi) Retrospective reconstruction should be possible on raw data files with change in parameters such as FOV.
- vii) The following scanning modes should be possible: SPR, axial, and spiral.
- viii) The SPR length should be more than 150 cm long and the width must be at least 50cm.
- ix) It must be possible to obtain the SPR from AP or PA or left to right or right to left directions.

- x) The ability of the system to reproduce the scanning protocol from the SPR should be ± 3 mm or better
- xi) The accuracy of distance measurements in the SPR (taken at isocenter distance) should be better than twice the pixel dimension.
- xii) ECG & Pulmonary waveform phase gated and amplitude gated 4D CT image acquisition facility to be provided with ECG and Pulmonary probe.
- xiii) Essential facilities like surrogate markers, infrared sources and camera connected with ECG & Pulmonary in trace for 4D CT data acquisition.

1. G. IMAGE QUALITY:

The reconstruction matrix must be 512 x 512 or higher. Simultaneous scanning and reconstruction should be possible. The image reconstruction rate should not be less than 15 /second. It should be possible to do:

1. Simultaneous scanning & routine analysis.
 2. Simultaneous scanning & archiving and / or hard copying and
 3. Simultaneous scanning and transfer to second console / workstation.
- i) The system must have automatic mA control software that automatically adjusts mA for patient size, adjust mA along the z-axis, modulates mA during rotation.
 - ii) **High contrast spatial resolution:** It should be at least 15 lines per cm or better maximum at 0% MTF X-Y axis with spiral and axial mode scan.
 - iii) **Low contrast detectability:** At least 5mm or less @ 0.3% using 20cm CATPHAN phantom on 10 mm slice thickness.
 - iv) Display matrix should be minimum 1024 x 1024 or more

1. H. SPIRAL PARAMETERS:

- i) Different selection of pitch should be possible, from 0.6 to 1.5 or wider. Please mention the pitch available. Mention the single run coverage and the table scannable range. Inter Scan Delay in different group of spiral should not be more than 5 sec. Single continuous spiral-on-time should be minimum 100 seconds or more and at least 1000 mm long.
- ii) The following scanning modes should be possible: Scanogram, Axial, Spiral, and Cine and Biopsy mode.

1. I. 4D Respirator Gating:

4D CT Simulation should be compatible and seamlessly integrated with the 4D gating system of the Linear Accelerators with Treatment Planning System, Record & Verify System, Portal (CBCT) imaging system, IGRT package existing in the department. Phase and amplitude based sorting should be possible in 4D CT Simulation system for respiratory gating.

2. COMPUTER SYSTEM:

2. A. COMPUTER SYSTEM OF CT SCANNER:

- i) State-of-the-Art, high end main computer system, must be provided. Details to be specified.
- ii) There must be at least two monitors in the console and they must be 19" LED monitors. One of these will be used for acquisition and the other will be used for review and processing. The resolution of the monitors must be 1024 X 1024 or more.
- iii) The hard disk capacity of the main computer system should be at least 500 GB or more. RAM size must be at least 8GB or better. In the hard disk meant for image storage, the number of uncompressed 512 x 512 images that can be stored should be at least 2,50,000 or more. A scalable 2D / 3 D PACS image reading solution with five client work stations and 40TB online storage, having the following features for at least three concurrent users :
 - Image Presentation - 2D, MPR, MPR Thick, MPR/MPR Fusion, MIP, MIP Thin, MinIP, VRT, VRT Thin.
 - Image Evaluation – Distance, Angle, Marker, Region of interest, Volume of interest, Arrow, Pixel lens, Plane annotation text, Synchronized scrolling based on Anatomical Registration, Correlated cursors.
 - Image Processing – Clip plane slab, clip box, Punching, bone removal, Parallel and radial ranges, Curved ranges, 2 D & 3D reference lines, 3D reference point Movie (Including export), Interactive segmentation (“Region growing”), Volume measurement on RG objects.
 - Total Quantity of Hardware and consumable are required in 5 year period (Staggered supply) are:

DVD / CD RW – 1500 per year

For archiving, DVD writer should be provided for providing copies of individual studies. The archiving system should provide back up for imaging needs for at least 2 years.

All necessary hard ware and consumables (DVD / DAT cartridges) to be specified and provided by the vendor for a period of 5 years from machine commissioning as and when required.

A Bi-directional speaker communication must be provided between the operator and the patient.

A multi-language (in English and common Indian languages) command prompt system for breath holding or other patient instructions required during scanning shall be provided.

2.B. Computer System for Moving Laser System:

The laser system provided must be 5 moving red LASERS for marking the isocenter without moving the table top. Following the isocenter localization in the CT simulator workstation, the isocenter coordinate will be sent directly to the computer system that is controlling the movements of the lasers. This computer in turn should drive all the lasers, so that without moving the table top, the lasers point to the isocenter. Complete quality assurance tool (as stated above) must be provided. The control computer system must be state of the art Windows based system with latest processor.

2.C. Connectivity:

- i) The entire CT Simulation system must be interconnected (all the workstations, laser systems, printers etc.) and must be integrated into the department's existing treatment planning systems for smooth transferring of images and DICOM-RT structures. The system should be networked with all radiotherapy treatment planning systems in the department and necessary software support shall be provided for all existing External beam radiotherapy and Brachytherapy planning. Necessary hardware and software solutions for the same, including networking and proper functioning must be provided by the vendor.

Requirement of LAN connectivity is noted hereunder:

Sl. No.	Modality
1	Treatment planning system of LINAC
2	Treatment planning system of HDR Brachytherapy system.
3	Treatment planning system of Tele-Cobalt unit

- ii) Complete import export options and archival facility with third party systems shall be provided.

2.D. Mould Room Facility within CT room :

To install the Mould room facilities the demarcated area is to be prepared to make Mould room facilities within the CT Simulator room. Racks and platforms for keeping mould room accessories should be provided. Necessary power supply points for the followings should be provided

Vac. Lock System

Digital water bath for thermoplastic precuts

Heat gun

2 .E. Quasar Respiratory motion phantom (4D phantom) must be provided with following Feature and components

- i) Rotation Stage for 3D motion
- ii) Acrylic Insert
- iii) Cedar Insert with Solid Tumor
- iv) Cedar Insert with Solid Tumor – Drilled
- v) Cedar Lung Tumor Insert (Split)
- vi) Hollow Insert with Screw Cap
- vii) Film cassette insert
- viii) 4D CT imaging insert
- ix) PET/CT insert
- x) MP insert adapter
- xi) Offset Cedar Insert with Solid Tumor
- xii) Offset Cedar Insert with Solid Tumor – Drilled
- xiii) Offset Cedar Lung Tumor Insert (Split)
- xiv) Cedar Ion chamber holder

3. Essential accessories to be included with the unit:

All sets of patient positioning accessories namely head holder, positioning kit, mattresses (for diagnostic procedures) must be provided.

3A. UPS: On line UPS with Maintenance Free batteries for the backup of the entire system for at least thirty minutes.

3.B. LASER Camera: Dry laser camera to be provided.

3.C. Lead Glass: 100 cm X 150 cm or more with lead equivalent meeting the AERB's radiation safety requirements.

3d. Pressure Injector: CT compatible pressure injector with remote console along with 100 disposable syringes.

3.E. Dose computation & display: The system should display CTDLw (CTDI1 00), DLP

3.F. Quality assurance accessories and phantom: All QA tools (CATPHAN, Laser Alignment, QA tools etc.) of international standard must be provided.

3.G. Remote system monitoring: Remote tools and software should be included along with broadband Internet connectivity for on-line remote diagnosis. All such running costs will be at supplier's account for the duration of warranty and CMC.

3.H. One standard CT printer with minimum 100 CT films of standard make and size to be provided.

3.I. One advanced A4 colour laser printer with network connectivity shall be provided. New cartridges for the printers to be provide as and when required for a period of 8 years limited to total of 10 numbers.

3.J. Appropriate battery and UPS for smooth running of simulator Console and work stations of the system to be provided with facility for replacement of batteries as and when required for a period of 10 years.

4. CT SIMULATION WORK STATION:

4.A. GENERAL:

The workstation should have advanced CT simulation tools for radiation therapy treatment planning including workstation that can control the laser marking system. Any CT-simulation workstation that cannot control the laser marking system is not acceptable and liable to be rejected. The vendor should give a completed description about the laser marking system offered and how the CT-Simulation software integrates with it and TPS. The workstation should be able to provide complete volume definition and geometric beam placement for radiotherapy. It should have complete compatibility and error-free networking with the CT scanner computer and TPS (External Beam and Brachytherapy, both already existing and TPSs for Linacs to be installed).

The CT-Simulator system should be fully DICOM complaint. The DICOM should support the following:

- DICOM 3.0 Print service class as a user.
- DICOM 3.0 Storage class as a user.
- DICOM 3.0 Storage class as a provider.
- DICOM 3.0 Send / Receive.

- DICOM 3.0 Query / Retrieve service class as a user.
- DICOM 3.0 Query / Retrieve service class as a provider.
- DICOM compliance statement should be provided.
- System should be Health Level 7 (HL-7) compliant.

4.B. HARDWARE:

Hardware specification should be mentioned clearly. The system should run on a high-end workstation platform of reputed brand with Networking with TPS – All the software with licenses required should be included.

4.C. SOFTWARE:

Complete software doing all the functions of CT simulator as per requirement and should have following features:

- i) Software should be Unix / Window / Silicon graphics based system.
- ii) The software should have a volume accelerator for high speed 3D rendering at full spatial resolution.
- iii) On the monitor screen it should be possible to view at least 36 images or more.
- iv) The standard screen layout should consist of one main view port and three Sub-view ports for frequent usage of other images, quick manipulation of Images, or for displaying reference views, while the main view port is used for high resolution display.
- v) Image manipulation such as changing window width and window level, hot keys activated automated study archive, deletion, screen layout changes, disk space display, archiving, and graphic overlays such as annotation.
- vi) **It should be possible to simulate all kinds of teletherapy machines in the simulation workstations.** It should conform to IEC and other international standard norms and support cobalt therapy, linear accelerator of all types, and other user defined linear accelerator and compatible with multileaf collimator of all the vendors.
- vii) It should be possible to visualize interactive reference views in axial, coronal, sagittal, isocenter image planes and in any oblique directions with overlay of beams on DRRs.
- viii) DRR must provide fully divergent beam's eye view of at least 512x512 matrix.

- ix) The DRR/BEV and Room Eye View image should display the machine diagram to allow real-time checking of machine and patient geometry.
- x) Facility for multi-modality fusion to accept the data from other DICOM compatible and DICOM supporting modalities such as MRI/CT/SPECT/PET should be able to fuse them.
- xi) Antivirus software for the entire network with time to time up gradation must be provided if CT and workstations are MS Windows based systems.
- xii) 4D Respiratory Image sorting with phase registration should be completely automatic and should be provided in the workstation.

4.D. CONTOURING AND MULTIMODALITY INTEGRATION:

- i) Volume definition should be possible using volume segmentation using threshold. Free hand contour tracing, contour editing. 3D anisotropic margins etc. and any other advanced tools must be available.
- ii) System must be able to contour in axial, sagittal, coronal and oblique projections.
- iii) It should be possible to do manual, semi-automated, fully automated contouring/segmentation in the images by defining volume of interest.
- iv) Mention the time taken for automated contouring with a single mouse operation.
- v) The software should have facility for automated uniform or non-uniform margins. For example it should be possible to expand the clinical target volume (CTV) on all three dimensions by same magnitude or by different magnitude to define the planning target volume. (PTV). Any software without this automated uniform/non-uniform feature will be considered as inadequate.
- vi) It should be possible to copy one organ to another with margin, and margins on a single slice, a range of slices or all slices.
- vii) It should also be possible to interactively edit the contours with user's choice of segments to reject or accept.
- viii) Interpolate algorithm should be available to provide interactive, shape based interpolation after contouring only in selected slices. The algorithm should automatically interpolate the closely fitting contour in other slices.
- ix) Interpolated contour may be edited; accepted or rejected.
- x) Tracking of source to skin distance should be possible.

- xi) Contouring and editing and extraction of wall should be possible.
- xii) System should have capability to integrate multiple modalities including CT/MR/PET/NM and correct for the positioning differences and contouring should be freely possible in any of these modalities. There should be seamless integration possible between these modality images during contouring session.
- xiii) It should be possible to interactively edit the contours with user's choice of segments to reject or accept.
- xiv) Dynamic contouring on 4D Multiphase data should be possible in different orthogonal planes simultaneously.

4.E. ISOCENTER MANAGEMENT:

- i) The software should support separate isocenters for multiple target volumes or general regions.
- ii) Marked and final isocenters should be reported and displayed in the localization package for easy confirmation of a physical simulation session.
- iii) Hardcopy of the isocenter coordinates should be possible for record of the simulation session.
- iv) Isocenter positioning should be automatic.
- v) There should be no limit on number of isocenters per target.

4.F. 3-D VIEW AND VOLUME RENDERING CAPABILITIES:

- i) Post processing features like volume rendering, real-time multi-axial volume reconstruction, 3-D surface rendering should be available.
- ii) It should allow completed 3D volume to be defined including complex 3D volumes, user selectable multi-image views; beams eye view, room eye view and DRR.
- iii) DICOM Radiotherapy plans and data structure with import/export of data should be possible. The DICOM compliance statement including necessary licenses should be provided.
- iv) Accuracy of locating any point in 3-D should be 0.1 mm or less.

4.G. BEAM PLACEMENT & DEFINITION:

- i) It should support extensive beam shapers (shielding blocks etc.) and beam definition methods.
- ii) Manual or automatic beam placement tool.

- iii) Tools for real time checking of machine geometry.
- iv) Beam shaping should be possible in multiple ways like automatic shielding block, definition conforming to selected volume, definitions aperture or shielding manual free hand definition, automatic collimator jaw or multileaf collimation position definition.
- v) It should be possible to define this asymmetric collimator feature, where both the X- and Y-axis of jaws are asymmetric, in the CT simulation software. Similarly the software should allow multi-leaf-collimator placement up to at least 40 pairs or more. Any software that cannot handle at least 40 pairs of MLC leaves is not acceptable.

4.H. DRR FEATURES:-

- i) Interactive DRR calculation mode must be available.
- ii) Automatic window width/level selection for DRR.
- iii) DRR should be interactively updated when the isocenter position is modified.
- iv) Should be possible to highlight or suppress different density region in the DRR.
- v) Printing of DRR images should be possible. DRR should be user defined.
- vi) Marco function to save a series of frequently used steps should be available.
- vii) Specify DRR image enhancement tools to improve DRR image quality.
- viii) Reconstruction of DRRs should be real-time or in sub-seconds.
- ix) Direct printing of DRR on laser film should be possible.
- x) Real time display of DRR as beam parameters changes.

4.I. DEPTH CONTROL:

- i) System should support depth control mode creating a DRR from slab of 3-D mode, perpendicular to beam axis.
- ii) DRR must be calculated over a user-defined thickness.
- iii) Depth control in oblique projections must be possible.
- iv) Should be possible to merge two DRR image on the same beam.
- v) Cross-hair display on DRR to provide scale information.

4.J. DATA IMPORT / EXPORT:

- i) System should be able to export image, volume and plan data in DICOM 3.0 standard along with all Radiotherapy specific data and private objects, DICOM RT plans and data sets.
- ii) System should be able to export DICOM RT data to the linear accelerator of any vendor.
- iii) CT simulator system should be fully integrated with the existing TPS. The vendor should inspect and will be responsible for complete integration.
- iv) All import and export licenses should be provided.
- v) DICOM 3.0 compatible Dry Chemistry Laser camera integrated with main console / workstation – more than 600dpi with 2000 Laser films shall be provided.

4.K. MEASUREMENT PACKAGE:

- i) The software should provide the density value (in Hounsfield unit) of a particular point on an image. It should compute distance along straight lines and curved lines, angles between the lines, and radius of curvature for curves.
- ii) For a specified region of interest, ROI, the area, minimum and maximum voxel values, mean and standard distribution and a density histogram should be available.
- iii) The software should be able to calculate the volume of a displayed 3-D object.

4.L. ADDITIONAL WORKSTATIONS: One additional workstations for contouring and plan evaluation shall be provided by supplier.

WARRANTY:

The supplier shall give a comprehensive warranty for two years after installation and handing over on the entire CT System including tube from principals. There will be no parts / services excluded. Comprehensive maintenance contract for next five years after expiry of warranty should be quoted separately. All parts and accessories like UPS batteries are included during the warranty and CMC period. The vendor is responsible for import of spare parts, custom clearance including taxes and transportation to the hospital during the warranty and CMC period without any additional payments by Institute.

TRAINING:

Training for one working week for four personnel (two Physicists and two Radiation Oncologists) at an Indian Training center where the latest radiotherapy techniques

with similar system/s are being routinely practiced for patient treatment for a reasonable period of time shall be arranged.

In addition to that, the vendor should provide on-site training for Radiation Oncologists, Physicists and Radiation Technologists of the Department for a period of not less than two working weeks in two phases (one working week in each phase) by application specialists for the seamless functioning of the entire system.

POWER SUPPLY:

Should work on three phase 400-440 V / 50 Hz Power.

Online UPS of suitable rating should be supplied for the complete system including Gantry, computer system, anesthesia delivery system; monitor and defibrillator with at least 30 minutes back up

Reset-table over-current breaker shall be fitted for protection.

GENERAL CONDITIONS:

1. The supplier shall quote for the most recent model of their machine.
2. Number of installations in India and worldwide should be provided for the quoted model only. Such installations should have been supplied directly by the quoting firm itself.
3. Declare separately the FOB and CIF prices.
4. No payments towards customs duty will be done for parts shipped in warranty and CMC period.
5. Warranty: The supplier shall give a comprehensive **warranty for 2 years from the date of commissioning approval** over of the system including local items (and battery replacements).
6. Up time guarantee of **97%** or more should be provided during warranty and CMC period. The calculation will be based on 24 hrs. a day, 365 days a year basis. The company must support **minimum 10 years** of the supplied machine along with software, spare parts and supplied accessories.
7. The supplier should provide & quote comprehensive maintenance contract inclusive of customs and all taxes for the next 8 years (i.e. year**3** to year**10** inclusive). All the items including consumable for functioning the equipment needs to be included in the CMC and no exclusion criteria will be accepted. The batteries of the UPS will be included in the above CMC quote.

8. Time taken for the delivery of the equipment and installation and commissioning should be mentioned.
9. Installation and Commissioning should be undertaken within three months of the arrival of the equipment or handing over the site for installation.
10. The vendors will check the adequacy of the treatment room air conditioning provided by the local authorities. In case the in room air conditioners provided at the installation are deemed inadequate / or if they require any replacements during a period of 5 years from commissioning, the same will be provided by the vendors. The details of the extra cost for the same are to be specified.

Site preparation including interiors for RG Kar MCH

The room should be renovated **as per required layout drawing to be prepared and should be get approved from AERB** according to the need of the specific machine. The indicative renovation work to be undertaken is noted below:

- i) **Painting of the rooms** – 2 coats synthetic enamel paints over 2 coats primer over wall putty (if required) wherever required
- ii) **Viewing Window:** 100 cm X 80 cm of 2 mm lead equivalence lead glass. Existing cut out to be modified as per requirement for installation of glass window of size 100 cm X 80 cm of 2 mm lead equivalence lead glass
- iii) **Floor:** Floor (except of CT room) should be of premier quality double charged joint less vitrified mirror polished tiles. Antistatic floor for CT room.
- iv) **Wall:** Walls should be of premier quality double charged joint less vitrified mirror polished tiles up to false ceiling other than the marble finished wall. Necessary replacement / repair of damaged marble before polish.
- v) **Polishing of existing marble wall and floor:** Existing floor and wall leveling to be rectified and should be high quality granite polished.
- vi) **Ceiling:** Ceiling should be of Mineral fiber board with aluminum grid. 2/3 coats of distemper on true ceiling. / High quality Ceiling paneling as suitable with existing infrastructure.
- vii) All existing doors in the designated area are to be replaced with a new one.
- viii) One additional entrance to be cut out and door to be installed at the Console room.
- ix) **Specification of Doors:** As per 3(d) under Site preparation including interiors and Air- conditioning for other 2(two) sites
- x) Necessary electrical fittings are to be installed.

- xi) High quality room lighting (LED up to 400 LUX of illuminance)
- xii) Earthing: Two nos. Copper plate earthing as per PWD schedule
- xiii) Necessary electrical earthing facility is to be prepared.
- xiv) False ceiling / High quality Ceiling paneling should be provided in all rooms.
- xv) Necessary power supply points for the followings should be provided in addition to standard power supply points
 - a) Vac. Lock System
 - b) Digital water bath for thermoplastic precuts
 - c) Heat gun
- xvi) Water basin with water in-out pipe line within CT room for mould preparation
- xvii) Medical Gas Pipeline system [O₂, N₂O, Air (4 Bar) and Suction] with imported outlet points along with matching adapter etc. should be provided. Inside pipeline in the Gantry room to be completed in all respect and the entry points of the pipelines should be terminated at a suitable place outside the Gantry room with medical grade isolation valves.

Furniture item to be supplied:

- a) Racks and platforms for keeping mould room accessories should be provided.
- b) Executive revolving chair with arm rest: 6 Nos. (Godrej / Featherlite or equivalent)
- c) Storage Cupboard: 3 Nos. high quality customized Wall mounted with locking facility
- d) Shoe Rack: 1 No
- e) Corner Table: 2 Nos. (Godrej / Featherlite or equivalent)
- f) Change room with Mirror
- g) Kg Fire extinguisher cylinder: 4 Nos.
- h) Console Table from OEM
- i) Contouring Workstation table 1200 x 600 mm: 1No. (Godrej / Featherlite or equivalent)
- j) Emergency Crash Cart in the CT room for storage of emergency medicines, medical equipment, trucut biopsy needles etc. – (Godrej/Janak)
- k) LED view box for four films
- l) Patient trolley with mattress, side rails, oxygen cylinder and fluid stand attachment: 2 Nos.
- m) Dehumidifier (22 Ltrs): 4 Nos.
- n) Patient waiting chair for at least 9 nos.

- o) One flat top table for patient.

Site preparation including interiors and Air-conditioning for other 2(two) sites

The interior work and lighting at the Gantry room, equipment room, console room, patient waiting area, toilet etc. should be of good quality and standard. Selected bidder will be handed over covered space of carpet area around 750 sq feet.

1. **Area to be prepared including interiors:** Carpet area of 750 sq feet approx. The area should have properly lead shielded wherever required as per **AERB** norms.
2. **Height of the room (up to false ceiling):** 3.0 m and above
3. **General**
 - a) **Floor:** Floor (except of CT room) should be of premier quality double charged joint less vitrified mirror polished tiles. Antistatic floor for CT room
 - b) **Ceiling:** Ceiling should be of Mineral fiber board with aluminum grid. 2/3 coats of distemper on true ceiling.
 - c) **Wall:** Walls should be of premier quality double charged joint less vitrified mirror polished tiles up to false ceiling. Wall specification should be as per **AERB** norms
 - a) **Door:**
 - i. **CT Scan room:** Double leaf door lined with 2.0 mm lead equivalence as per AERB norms
 - ii. **Main Entry to the unit:** First quality seasoned shagun wooden door of minimum 40 mm thick double leaf of width 1500 mm with 150 mm X 150 mm vision panel, viewing window, plastic kicking plate fixed with headless screw, high gloss wax polish. The door should be fitted with proper locking arrangement, door closure, handle and stopper. Wooden frame from 125 mm x 100 mm of good quality Shal / Shagun wooden block.
 - iii. **Other:** Good quality Flush Door with / viewing window
 - e) **Paint:** 2 coats synthetic enamel paints over 2 coats primer over wall putty (if required)
 - f) **Viewing Window:** 100 cm X 80 cm of 2 mm lead equivalence lead glass

4. **Air-conditioning machine:**

The total carpet area mentioned has to be properly air-conditioned @ 750 cu ft. for one ton. In the CT Scan additional AC to be considered depending on the heat dissipation by the machines.

Split / Ductable Split type AC machines having appropriate rating to bring down and maintain room temperature to be $20^{\circ} \pm 2^{\circ}$ celsius.

There should be sufficient number of the AC machines to run the service round the clock (i.e 100 % backup). The service should be uninterrupted in case of breakdown of any of the AC machine(s).

A/C ducting to be prepare, if required. Humidifier and Dehumidifier should be provided to maintain the humidity level at 40 - 60 % at Gantry room and in other area(s), if technically required.

5. High quality room lighting (LED up to 400 LUX of illuminance)
6. Necessary power supply points for the followings should be provided in addition to standard power supply points:
 - a. Vac. Lock System
 - b. Digital water bath for thermoplastic precuts
 - c. Heat gun
7. Medical Gas Pipeline system [O₂, N₂O, Air (4 Bar) and Suction] with imported outlet points along with matching adapter etc. should be provided. Inside pipeline in the Gantry room to be completed in all respect and the entry points of the pipelines should be terminated at a suitable place outside the Gantry room with medical grade isolation valves.
8. The bidders to submit drawing layout plan of the interior. At least 15 -20 patient holding positions has to be mentioned in the drawing layout plan. Sufficient furniture to be supplied for the console room.
9. **Wiring System:**
 - a) Light, Fan, 5 Amp Plug: 3 X 1.5 sq. mm copper conductor FRLS wire should be provided.
 - b) Power Plug (15 Amp): 2 X 2.5 + 1 X 1.5 sq. mm copper conductor FRLS wire should be provided.
 - c) Split/ Ductable AC wiring: 2 X 4 + 1 X 2.5 sq. mm / suitable gauge copper conductor FRLS wire should be provided.

Earthing: Two nos. Copper plate earthing as per PWD schedule

10. Furniture item to be supplied:

Racks and platforms for keeping mould room accessories should be provided.

- Executive revolving chair with arm rest: 6 Nos. (Godrej / Featherlite or equivalent)
- Storage Cupboard: 3 Nos. high quality customized Wall mounted
- Shoe Rack: 1 No
- Corner Table: 2 Nos. (Godrej / Featherlite or equivalent)
- Change room with Mirror

- 2 Kg Fire extinguisher cylinder: 4 Nos.
- Console Table from OEM
- Workstation table 1200 x 600 mm: 1 No. (Godrej / Featherlite or equivalent)
- Emergency Crash Cart in the CT room for storage of emergency medicines, medical equipment, trucut biopsy needles etc. – (Godrej / Janak)
- LED view box for four films
- Patient trolley with mattress side rails, oxygen cylinder and fluid stand attachment: 2 Nos.
- Dehumidifier - 22 Ltrs: 4 Nos.
- Patient waiting chair for at least 15 nos.
- One flat top table for patient.

Note: The items mentioned above are indicative in nature