

HSCC (INDIA) LIMITED
(A GOVERNMENT OF INDIA ENTERPRISE)
E-6(A), sector-1, NOIDA(U.P) 201301

AMENDMENT – IV

6th December 2024

Subject: Tender for “Supply and installation of the following Medical Equipment for Pt. Deen Dayal Upadhyaya University of Health Sciences, Kutail, Karnal, Haryana.

Tender No. HSCC/PROC/DMER/SSB/Kutail/2024 Dated 10.10.2024

This has reference to the above tender, the following Amendment may be noted which shall be treated as part of the contract to be uploaded & submitted along with their tender/ bid:

ITEM NO. 1 CT SIMULATOR

Sr. No.	Tender Reference	Representations Received	Decision of Technical Committee
1.2 CT Scanner 1.2.4	The maximum table sag/deflection should be <=4mm with 135 kg patient weight.	Request you to kindly delete this. Kindly amend as: Patient table should be TG66 compliant. Justification: We follow the IEC guidelines and Each vendor has their unique specification	The table sag should be comparable and compatible to all high energy linear accelerators. Table should be indexed. Table sag should be as per AERB protocol.
1.2 CT Scanner 1.2.5	The raw data memory of the computer for storage of images should be atleast 1TB or more.	The raw data memory of the computer for storage of images should be atleast 720 GB or more. Justification : Request you to kindly amend for wider vendor participation.	No change
1.2.9	QA phantoms for image contrast, resolution and dose evaluation.	Request you to kindly specify the phantom details. Justification : Request you to kindly provide the details for uniformity among all the vendors.	QA tools for CT simulator includes (specify make and model): <ol style="list-style-type: none"> 1. kVp meter 2. Dose meter/timer 3. mA/mAs meter 4. Al filter 5. Survey meter 6. High and low contrast resolution QA test phantom 7. CT number evolution (linearity and accuracy) phantom
1.2.11	The X-Ray generator should be high frequency generator with atleast 80kW power.	The X-Ray generator should be high frequency generator with atleast 75kW power. Justification : Request you to kindly amend for wider vendor participation	At least 75 kW
1.4	An additional workstation capable of handling all the post processing features of the main system should	Request you to kindly delete this.	No change

	<p>be provided in the Treatment Planning System room. Color printer should be added with each workstation</p>		
<p>1.9</p>	<p>4D CT Scanning facility: 4D CT Scan software with 4D phantom for QA shall be provided as standard supply and separately there shall be 4D CT Respiratory Gating hardware price provided if the main equipment needs such hardware as option.</p>	<p>Please specify details of 4D phantom for QA to make it uniform across bidders.</p>	<ol style="list-style-type: none"> 1. 4D CT Scanning facility shall be capable of retrospective and / or prospective respiratory compensated / gated CT to generate 4D datasets must be compatible with all commercially available hardware and software for motion management to localize the tumor in motion (specify the details) 2. Required hardware and software to generate/acquire 4D CT imaging should be provided. Also required compatible hardware with commercially available LINAC based image acquisition solution. 3. 4D QA Phantom for respiratory gating (Optional): Four dimensional (4D) respiratory motion phantom shall be capable for quality assurance test for IGRT, SGRT and respiratory gating. It should be programmable breathing and tumor motion simulation for end to end quality assurance for motion guided radiation therapy systems including C, LINAC, PET CT and ring gantry LINAC system. System should consist of hardware and software with license. There should be advanced phantom system and provision for insert for solid tumor, lung tumor, film insert, ion chamber insert etc(Note: This item and its cost may be quoted separately as an optional item. Specify the details of make

			and model and its functioning and configuration.)
	All types of phantoms needed for QA and approval will be provided by the vendor and their names should be mentioned by the vendor.	Please specify details of QA phantoms. We do not provide any phantom from our side.	As above
General Points Point 4	Each of the participating firms of all items specifically System A and System B must provide compliance statement point by point in an excel sheet in a CD and also a hard copy duly signed.	Please clarify System A and System B Justification : As per the tender, specifications are of CT Simulator. Please confirm the details for System A & System B mentioned here	Compliance to be provided for CT simulator system and turnkey work
General Points Point 4	UPS (at least 45 minutes backup/CVT/Stabilizer or any other electrical appliances required for the functioning of all the equipments shall be provided by the supplier.	UPS (at least 30 minutes backup/CVT/Stabilizer or any other electrical appliances required for the functioning of all the equipments shall be provided by the supplier. Justification : Please amend as also mentioned under point 2.15	UPS (at least 30 minutes backup/CVT/Stabilizer or any other electrical appliances required for the functioning of all the equipments shall be provided by the supplier.
General Points Point 9	Irrespective of the specification mentioned it shall be the sole responsibility of the firm quoting System A to physically inspect the site in detail, the pending job to be done at the site where above two systems are to be installed at Pt DDU UHS, Kutail as per regulatory guidelines. All the participating vendors for both the systems shall inspect the sites to access the pending work of their respective areas.	Please remove this and clarify the systems being referred here. Justification: There is ambiguity as the specifications are pertaining to CT Simulator for which quantity mentioned in tender is 1. However, some other system is being referred here. Please clarify the same and accordingly kindly amend	No change

Sr No.	Turn key work	Added para to CT Simulator Turnkey work
1	Designated Rooms and total covered area (meter ²)	CT room (6.5 x 5), UPS room(2.6 x 2.5), Control room (4.05 x 2.5), Physicist store room (14.84 m ²), Toilet (1.5 x 1.5), and Lobby (15.35 m ²) Total ground floor covered area: 81.6 meter²

Furniture:

Revolving chairs height adjustable, medium-back with hand rest-6 nos.

Chairs for patient waiting area-Three setter (chrome plated).-4 nos.

Cupboard with laminate door shutters for storage of spare parts and accessories and records as per requirement – 4 Nos

Drug trolleys for patient preparation areas- 1 Nos

Patient trolley with rubber foam mattress to be kept in the patient preparation room-2 Nos.

Name boards for all rooms. All the rooms in the complex will be signposted

Sun film and ventilation blinds will be put up in all windows

Tables for all Workstation

Changing rooms should have change lockers and dressing table

Dustbins (plastic with lid)-10 nos

ITEM NO. 2 HIGH DOSE RATE BRACHYTHERAPY MACHINE

Sr. No.	Tender Reference	Representations Received	Decision of Technical Committee
A.6	Multi – Channel Indexer: The unit must have a multi channel indexer facility (facility for at least 20 channel)	Multi – Channel Indexer: The unit must have a multi channel indexer facility (facility for at least 30 channel) Justification : Reason: As there are many interstitial applicators as part of the scope of this tender and these applications will be having more than 20 catheters and therefore cannot be used optimally.	No change
A.6	Multi-channel Indexer- The unit must have a multi-channel indexer (facility for at least 20 channel or more number of channels preferred) with automatic/optical verification of channel number and applicator connection. Proper indexer locking facility should also be there	Page no.2 Point no.6: We request to amend the point as below:-Multi-channel Indexer: The unit must have multi-channel indexer (Facility for at least 20 channels or more number of channels preferred) with automatic/optical/mechanical verification of channel number and applicator connection. Proper indexer locking facility should also be there.	The unit must have a multi-channel indexer (facility for at least 20 channels, with preference for more channels) with automatic/optical/mechanical verification of channel number and applicator connection. Proper indexer locking facility should also be included.
D.1	HDR System’s applicators, Templates,Interstitial Needles and Catheters	We request you to pleas provide the size and quantities required of each respective applicator, needles and catheters	Details as per annexure 1.
D.1	D: HDR System applicator. templates. Interstitial needles & catheters:The quantity required for the following	Pls provide the detail about the quantity required for refereed applicators	Details as per annexure 1

	applicators are missing; - Endometrial Applicator,- Prostrate Templates,- Oesophagus Applicator,- Bronchial Applicators,- Nasopharyngeal Applicator,- Breast Template		
I.1	Warranty Period	Kindly clarify the warranty and CMC Period.	As per standard tender terms and condition
J.1	Staff Training	Kindly amendt the same as:One working week in India Justification : As for HDR system one week is sufficient.	Seven working days
A.1	A: HDR System Main Treatment Unit Treatment unit/ Source Head: The unit should preferably have a telescope head to adjust for various heights.	Treatment unit/ Source Head: The unit should preferably have a telescope head to adjust for <u>various heights/ Fixed Head</u> Justification : In the current time all the HDR Brachytherapy System from all the manufacturer is coming up with fixed height which can negotiate the source movement to any height as desired for the treatment of cancer patient without compromising the quality of treatment and patient comfort.	various heights/ Fixed height
B	B. HDR SYSTEM'S CONTROL UNIT: The HDR System's Control Unit should be a standalone, independent and PC based unit. The controlling PC should be equipped with state of the art software and hardware configuration (preferably a latest international standard processor based CPU (like 17.3 GHz or higher) along with DDR4 memory (16G 2133MHz DDR4 (2 X 8G)), international standard ACP (Accelerated Video Graphics Card, Intel® HD Graphics 620 (7th Gen Core) with dual full HD display), sound card, network card with fibre connectivity, modem, high storage capacity (preferably 4To2) Hard Disk Drive (1000RPM), high storage capacity back-up/data retrieval media drive (like CD/DVD/BD writer or any other latest device), HDMI and Display port, USB 3.0 with Power Share, with licensed Windows 10 Pro 64 bit, upgradable, optical drive etc. It should have at least one parallel, two COMs and six USB unused ports along with multiple free expansion bays and PCI slots for future upgradation. There should be an international standard keyboard and an optical scroll mouse. There should be an international standard high-resolution touch screen LCD display terminal.	Request to amend or delete this point as our HDR Brachy doesn't have LED display	No change

B.J	Facility for creating and keeping a large patient database library/records in the systems computer's hard disk along with a data retrieval option to an external storage media also must be provided	Kindly specify the required storage capacity of external storage media/device.	The system must support large patient database library/record storage on the system's hard disk and include a data retrieval option to an external storage media with a minimum capacity of 2 TB.
C.5	The multi-strand source cable should have at least 49 strands and should not have a diameter more than 1.0 mm.	Flexibility parameter is not only dependent on the number of strands but also there are other impacting factors to flexibility like the material of the strands or how they are build up to a cable.We have 46 strands available in our system. Hence request you to amend at least 46 strands.	The multi-strand source cable should have at least 46 strands and should not have a diameter greater than 1.0 mm,
C.10	The system should have facility to use needles/rigid applicators of at least 18 gauge or thinner and accordingly the source cable must be able to negotiate inside the needles/applicators.	Page no.3 point no.10.Request you to please amend the needle size at lease 17 Gaugeas we dont have 18G.	The system should have the facility to use needles/rigid applicators of at least 17 gauge or thinner, and the source cable must be able to negotiate inside the needles/applicators.
D.1	Vaginal applicatos, Rectal applicators and templates (2 sets)	page no.4 point no.1 kindly specify the exact required template.	Details as per annexure 1
D.1	Nasopharyngeal applicators	page no.4 point no.1 (Nasopharyngeal applicators), we dont have Nasopharyngeal applicator. Hence request to delete the same	Details as per annexure 1
D.1	Breast applicators;flexible Implants complete set with at least 1000 numbers of Flexible tubes.	Page no.4 point no.1 Number of flexible tube asked for 1000 Qty which is huge quantity please consider to reduce the quantity and also please provide type of tubes (single leader, double leader, blind end etc)	Details as per annexure 1

D.1	Rigid Needle Implants complete set with at least 30 Numbers of needles	Page no.4 point no.1 please provide length expected.we have implant needle in sizes of 10cm, 12cm, and 15cm for implant tube.	Details as per annexure 1
D.1	Tongue templates/applicators	Page no.4 Point no.1 We dont have Tongue templates. Hence we request to kindly remove this.	Details as per annexure 1
D.1	Various Interstitial templates and rigid needles,Various flexible catheters/tubes	page no.4 point no.1 please elaborate what type of interstitial template expected.	Details as per annexure 1
E.1	Three Dimensional Treatment Planning System:	Our Brachy planning system doesn't have own operating table. however we can provide a normal workstation based Table hope it is acceptable. please confirm.	Three Dimensional Treatment Planning system should have two work stations (one for dose calculation engines licenses and one floating contouring licenses). In case of normal work station, planning system should be supportive and can be integrated with the HDR brachytherapy system for 3D planning. The supplier should give details of the hardware and software of the system.
	It must have its own operating table. Preferably there should be two workstations	Our Brachyvision solution offers both contouring and planning. all dose calculation licenses are standard in Brachyvision. Hence we may not able to provide separate system for dose calculation and separate system for contouring system. Hence request to make it as one workstation	Clarified above

H.11	Essentially Required Accessories:	Our UPS is integrated to GM+iX system and user can define alert and action levels and can see the UPS status on the console and Afterloader touch panel in realtime. 2 hours back up is very high. we could able to provide upto 15mins to remove the patient or complete the treatment, in case power goes off. Hence we request to kindly amend as at least 15mins.	No change
H.11	On-Line UPS: Two hours back-up time must be provided to provide adequate power coverage		No change

Annexure -I (HDR Brachytherapy system)

The supplier should supply the following minimum number of template/applicators for various sites of brachytherapy treatment. It is a sole responsibility of the supplier that the details of items and accessories related to template and applicators such as guide/applicator tube, markers, fixation devices, buttons, stoppers and sterile agents essentially required for the treatment should be enlisted and supplied.

1. Uterine/Endometrial applicators:

- a. Fletcher suit type- Intrauterine tube 40mm-15° (one set), 50 mm- 15° & 30° (one set each), 60 mm-15° , 30° and 45°(One set each), Ovoid cap 20 mm and 25 mm (2sets each)
- b. Ring applicator-Intrauterine tube 50 mm-30° and 60 mm-30° (one set each)
- c. Advanced universal Gynecological (cervix, parametrium and vaginal) interstitial type applicator- perineal template, Intrauterine tube 40mm & 50 mm, 15° & 30°, ovoid pair(optional) 20 mm & 25 mm, includes fixation element, ovoid tube, rectal retractors and other accessories.(complete set)
- d. Transfer tube/applicator guide and markers: 20 No.

2. Vaginal applicators:

- a. vaginal cylinder applicators – 20mm and 25 mm dia (1set each)

- b. Vaginal multichannel Applicator- 20mm and 25 mm dia (1sets each)
 - c. Vaginal cuff applicator- intrauterine 40 mm, vaginal cylinder 20mm and 25 mm dia (1sets each)
 - d. Shielded cylinder applicator- vaginal cylinder applicators – dia 20mm and 25 mm dia , shielding angle 90° and 180°.
 - e. Transfer tube/applicator guide and markers: 5 No.
3. Prostate, rectum & Bladder applicator:
- a. Prostate template with fixation and locking tool- base plate and fixation plate assembly
 - b.
 - c. Universal perineal interstitial template applicator- to treat perineum, vagina and rectum. Include base plate, cover plate, vaginal cylinder (20mm and 25 mm) and other accessories.
 - d. 200mm 17 gauge length needles no. 30
 - e. Transfer tube/applicator guide and markers: 24 No.
4. Breast template applicator: Breast template in two numbers (preferably different size and type) includes
- a. Adjustable template bridge and set of template leaves
 - b. Double and triple plane holes at least 10 mm gap
 - c. Metal needles 200mm, 17 gauge in 30 no.
 - d. Flexible Catheter 50 cm 300 no.
 - e. Transfer tube/applicator guide and markers: 24 No.
5. Bronchus applicator: Bronchus applicator of 140 cm length includes fixation device (2 sets)
6. Esophageal Applicator: Esophageal applicator of length of at least 140 cm flexible catheter of 8 & 10 cm diameter with fixation devices and marker and other accessories(2 sets for each dia.)
7. Nasopharyngeal applicator: Nasopharyngeal applicator with catheter set of at least 30 cm length (2 sets)
8. Tongue Template/applicator: Tongue Template/applicator with adjustable holder of at least 10 holes and needles 200 mm, 17 gauge(10 needles)
9. Surface mould applicator (one set)
10. Flexible plastic Catheter for interstitial implant of 50 cm 300 no.

Note: if transfer tube/applicator guide is universal for all the applications then total maximum number of transfer tube/applicator guide should not exceed 40 and rate should be quoted accordingly.

Sr No.	Turn key work	Added para to HDR Brachytherapy
1	Designated Rooms and total covered area (meter ²)	BT proc. room (25.1), OT room(7.5), Scrub and Change(8.1),Co-60 room(25.0) (5.35)Maze area (5.25+3.75+0.42), Planning and control (16.17), Passage(16.8) m ² Total ground floor covered area: 108 meter²

F	Furniture:	
	Revolving chairs height adjustable, medium-back with hand rest-6 nos.	
	Chairs for patient waiting area-Three setter (chrome plated).-4 nos.	
	Cupboard with laminate door shutters for storage of spare parts and accessories and records as per requirement – 4 Nos	
	Drug trolleys for patient preparation areas- 1 Nos	
	Patient trolley with rubber foam mattress to be kept in the patient preparation room-2 Nos.	
	Name boards for all rooms. All the rooms in the complex will be signposted	
	Sun film and ventilation blinds will be put up in all windows	
	Tables for all Workstation	
	Changing rooms should have change lockers and dressing table	
	Dustbins (plastic with lid)-10 nos	

ITEM NO. 3 Advance High Energy Linear Accelerator

Sr. No.	Tender Reference	Representations Received	Decision of Technical Committee
1	Photons of 6 and 15 MV. The Linac shall deliver IMRT, VMAR/RAPID ARC,3D CBCT and gated Delivery as package and shall be upgradable to 4D kV one beam CT (IGRT), external micro MLC for practicing SRS techniques etc in future. Such options shall be offered in the tender and shall have validity of at least 2 years for such upgrade/any options if the hardware upgrade is required, that shall be costed in and quoted to avoid any hidden charges in executing such options/Upgrades	Request to please include 3 photon energies. 6, 10 and 15MV External HDMLC is asked under the optional items. kindly note that we don't have the external HDMLC system in LINAC system. We can provide either 5mm or 2.5 mm MLC. Hence request you to kindly amend this point. Kindly specify that whether optional items are part of L1 calculation	Photons of 6, 10 and 15 MV (FF/FFF beams). The Linac shall deliver 3D CRT, IMRT, VMAT/RAPID ARC , DCAT (SRS, SRT & SBRT) , gated Delivery as package . The system should have micro MLC for practicing SRS techniques.
2.a	Energy (MV)	Request you to add 10 MV FF photon energy	6 MV FF, 6MV FFF, 10 MV FF, 10MV FFF, 15 MV FF, 15 MV FFF photon energy

2.e	Wave guide: The wave guide shall have atleast 15 years full replacement warranty	Kindly note that the life style of the machine is for 10 years and hence we cannot offer 15 years full replacement warranty .Hence request you to amend this point	Wave guide: The wave guide shall have at least 10 years full replacement warranty
10.b	Field size:A method to obtain irregular field shapes shall be provided	Please elaborate the expectations	deleted
11.e	Other Specifications: e)The distance from the end of the lower collimator to the isocenter shall be ≥ 45 cm	This is vendor specific value. Hence Request to kindly delete or amend as "Please specify"	The distance from the end of the lower collimator to the isocenter shall be more than 40 cm
11.g	g) The height of the isocenter above the finished floor shall be less than 130 cm	Kindly amend as less than or equal to 130cm	The height of the isocenter above the finished floor shall be less than or equal to 130 cm
11.i	i) The Chiller system shall be part of the equipment shipped (factory tested).Local chillers shall be not accepted and the tender shall be rejected.	Kindly note our chiller system is validated by our factory for running our LINAC system. Hence request you to amend the point as below The Chiller system shall be of factory tested and validated.	No Change
11.j	j) Imported voltage stabilizer shall be provided for power spike protection.	We provide the factory validated UPS System.we are not offering any imported Voltage stabilizer,hence request you to amend the same.	voltage stabilizer shall be provided for power spike protection.
16	Physical/Motorized/Dynamic/Virtual Wedge: Alternatively Universal motorized wedge with 1-60 degree	we offer both Physical wedge and Dynamic wedge. Universal Motorized wedge is not applicable for siemens. Please make it as "If available"	Physical/Motorized/Dynamic/Virtual Wedge/ Universal motorized wedge (1-60°)

17	Asymmetric Collimators: b) Travel ranges X:-20 cm +12.5 cm Y:-20cm to 0 cm or more	Instead of mentioning specific value, Please amend as "Please specify", so that respective vendors can mention their values.	Specify the travel range
18.a	Multi leaf collimator (MLC): a) No of Physical Leaves -40 pairs (80 leaves with at least 2.0 cm/sec speed including the guide speed but excluding carrier speed) MLC with combination of 10 mm leaves,which shall provide maximum of 40 x 40 cm ² field size.	MLC specification provided in the tender is very Old,so please consider at least 120 MLC (60 Pairs) and combination of 5mm and 10mm Resolution of MLC	Multi leaf collimator (MLC): a) No of Physical Leaves -60 pairs at least (120 leaves with at least 2.0 cm/sec speed including the guide speed but excluding carrier speed) MLC with combination of 05 mm and 10 mm leaves, which shall provide maximum of 40 x 40 cm ² field size.
18.c	c) Leaf width at isocenter 10 mm for lateral leaves in 80 leaf combination shall be Capable of performing conformal therapy procedures	MLC specification provided in the tender is very Old, So please consider at least 120 MLC (60 Pairs) and 5mm Resolution of MLC	Leaf width at isocenter 5 mm & 10 mm for lateral leaves in 120 leaf or more combination shall be Capable of performing conformal therapy SRS/SRT procedures
18.d	d) Workstations shall have SW and Hw,the minimum shall be Pentium 4,1 GB memory or more,5 USB port,UPS etc.	Please remove this line item, Not applicable for latest digital Linacs	Specify the detail configuration of workstation. The system should be advanced and latest configuration.
18.e	e) Integration (full Networking).conventional simulator,CT scanner,CT	Can you please provide more information about conventional simulator available at department.	Integration (full Networking) to CT scanner, CT simulator, MRI, PET CT , RFA , dosimetry systems and

	Simulator,MRI & RFS should be done via Planning system		treatment Planning system (any Vender)
18.f	f) 3D CRT, IMRT, VMAT/RAPID ARC, and optional DCA (SRT & SBRT) delivery shall be offered.	What is DCA please elaborate	3D CRT, IMRT, VMAT/RAPID ARC and DCAT (SRS, SRT & SBRT) delivery shall be offered. VMAT /RAPID ARC shall have dynamic control of MLC, dose rate, diaphragm, gantry , collimator rotation and shall be capable of full field VMAT/RAPID ARC capability. DCAT (dynamic conformal arch therapy)
18.i	i) Leaf height minimum 9 cm for reduced peak transmission under 0.5%	Vendor specific, please delete the line item or amend as "Please specify"	Specify, it should be as per AERB norm
18.m	m) Transmission within 0.5%	Vendor specific. Please delete or amend as "Please specify"	Specify, it should be as per AERB norm
18.n	n) X ray leakage within 0.2%	Vendor specific. Please delete or amend as "Please specify"	Specify, it should be as per AERB norm
18.p	p) Maximum leaf (including each leaf guide excluding carriage) speed shall be 2.5 cm/second for 120 leaf combination and 6 cm/sec for 160 leaf combination.	In point no.(a) 40 pairs of MLC asked, but here 120 and 160 MLC leaf speed is mentioned. Please clarify	Rectified above, hence no change

18.q	q) Positional accuracy of the leaves during treatment 0.5 mm	As of now there is no real time position accuracy indicator or measurements. Hence remove the word "during treatment"	specify Positional accuracy of the leaves
19.b	Treatment Couch: b) Movement range: Longitudinal 0-100 cm, Lateral -25 to + 25 cm, Vertical 110 cm from lowest point of 65 cm from the finished floor and Rotation -90 to + 90 degree	Our lateral range is 24.5cm, either Amend as - 24 to +24 or agree for 24.5cm Our vertical range is 96.5cm, Hence request to amend as at Least 95cm we have 73cm, hence request to remove the specific values and amend as "Please specify"	Treatment Couch: b) Movement range: Longitudinal 0-100 cm, Lateral -24 to + 24 cm, Vertical range minimum of 95 cm from lowest point. Lowest point shall be from 65 cm to 75 cm from the finished floor and Rotation -90 to + 90 degree
19.c	c) Electrical & Mechanical Control in case of power failure	we can provide mechanical control in case of power failure. Request to remove the Electrical	Electrical or Mechanical
19.A.a	A.Robotic Couchtop: c) The Couchtop, equipped with the new generation homogenous carbon fiber couchtop and includes a tracking system with controls, both inside and outside the treatment room.	These are the vendor specific specification. Hence request you to amend or delete this specification.	The robotic Couch top made of carbon fiber free from metal & radio opaque materials and should be indexed
19.A.d	d) The Resolution of the Robotic couch shall be 0.1mm with speed up to 16 mm/second linear transational movement or more I. Movement Range	The Resolution of the Robotic couch shall be 0.1mm is a very tight tolerance. Request to amend as "Please specify the resolution of couch position and speed" conflicting with point no.19 (b)	Specify the resolution and speed for linear translational movement of the robotic couch top

	<p>II.X Lateral + 30mm or more</p> <p>III.Y Longitudinal + 30 mm or more</p> <p>IV.Z Vertical + 30 mm or more</p>		
19.A.e	<p>e) There shall be a tracking system Mounted on Universal Ceiling Mount (UCM) along with software controls the robotic couchtop and validates the table position which make use of high-precision camera tracks the markers on the reference frame in real time</p>	<p>These are the vendor specific specification. Hence request you to amend or delete this specification.</p>	<p>Details of treatment couch position tracking system shall be provided.</p>
19.A.h	<p>Specify the range of different motions of the treatment couch.</p>	<p>In point no.19 (b) and A (d), specific range is asked and here its asked to specify the ranges again. In that case. please delete point no.19 and d</p>	<p>deleted</p>
19.A.i	<p>The maximum height of the couch shall be at least 50 cm above the isocentre to treat indications like lower or upper body radiation at 150 cm SSD without reversing patient.The lowest couch position shall be 65 above the finished floor.</p>	<p>The lowest couch position shall be 65 above the finished floor but we have 73cm, hence request to remove the specific values and amend as "Please specify"</p>	<p>Specify the maximum height of the couch from isocenter level</p>
19.A.k	<p>Patient support panel in the couch shall be provided to facilitate large posterior treatment at extended distances without moving the patient.</p>	<p>Please provide more details</p>	<p>deleted</p>

19.A.1	The accessory rails beside the patient support panels shall be removable allowing treatment and port film images without interference from the rails	Please provide more details	deleted
21	<p><i>Portal Imaging & Accessories</i></p> <ul style="list-style-type: none"> <i>1) Portal imaging should fully integrated with Accelerator</i> <i>2) Should be able to take images at any Gantry angles with variable X-Y movements. Robotics Arm with remote control</i> <i>3) Should have Digital technology with High Resolution 1024 x 768 pixels or more Imaging (Amorphous Silicon Flat Panel Based Technology)</i> 		<p>Amended as: Electronic portal imaging system:</p> <ol style="list-style-type: none"> 1. Integrated amorphous silicon(aSi) based electronic portal imaging device (EPID) panel mounted on motorized arm for digital imaging shall be provided. 2. System shall be capable of performing online and offline 2D MV IGRT corrections strategies. 3. The panel shall include anti-collision system. 4. EPID based 2D portal dosimetry system for IMRT and VMAT patient pretreatment verification for available energy

			including FFF beams shall be provided.
22	<p>22. a. KV based 3D IGRT shall be provided and such system shall have FDA clearance. The System shall have x ray source which may be manual or automatic movement with an automatic flat panel system of 1024x1024 pixel or higher and shall have software for 2D radiography, 2D fluoroscopy and 3D cone beam (volume) CT softwares, with manual/automated DICOM, kV IGRT QA tools.</p> <p>b. Respiratory gated treatment delivery system/s which can be used in both CT scanner and Linear Accelerator shall be provided.</p>		<p>Amended as: Cone-Beam CT imaging system:</p> <ol style="list-style-type: none"> 1. System shall have an integrated amorphous silicon based flat panel detector and kilovoltage (kV) x-ray source/tube for generating radiographic fluoroscopic and 3D and 4D cone beam computed tomography (CBCT) imaging for 2D, 3D and 4D IGRT treatment verification with 3D and 6 D correction strategies. 2. System shall be capable of performing reconstruction methods of either Feldkamp back projection (FDK) algorithm and/or iterative algorithm. 3. System shall be capable of manual registration,

			<p>automated bone registration, automatic soft tissue registration or gray value based registration method.</p> <p>4. Necessary IGRT commissioning and quality assurance phantom for image quality assessment and daily MV and KV , KV/MV isocenter alignment (QA geometric phantom with analysis software system shall be provided.</p>
22.c	b.Respiratory gated treatment delivery system/s which can be used in both CT scanner and Linear Accelerator shall be provided.	Kindly add Retrospective and Prospective Gated treatment delivery	No Change
23	Treatment Planning System: The planning system shall have 2 Calculation energies with planning capability for conventional,and arc electrons,conventional,wedge,3D CRT/IMRT/MAT/RAPID ARC, There	Request to specify the desired no of calculation and Non calculation workstations	Treatment Planning System: 2 work stations for dose calculations with license & 3 work stations for virtual simulation (virtual simulation,

	shall be 3 contouring system to be provided in which one of the contouring station have the ability to dp virtual simulation,second system shall have auto segmentation and the third shall have auto fusion.		auto segmentation and auto fusion)
23	Work Station Server (With its specifications)	Please remove the specific requirements. our server is factory validated. we cannot assemble the server with different combination. Hence we request to amend as "vendor shall quote, latest HW and server with latest OS & SW"	vendor shall quote, latest HW and server with latest OS & SW. specify the detail configuration of workstation
23	Collapsed Cone Convolution algorithm for photon beam dose calculation Pencil Beam Algorithm for Photon beam dose calculation	Vendor specific algorithms asked. Please neutralise the requirement. we provide AAA, Acuros for photon and electron Monte carlo for electron energies.	The photon beam algorithm shall use advanced kernel method such as convolution/superimposition Boltzmann transport. It should be ACUROS or Monte Carlo based
23	Should include Montecarlo dose calculation for Electrons module with possibility to have Calculation of electron beams of 4-30 Mev from linear accelerators and support of Support from Square,circular and rectangular applicators	Kindly note: we provide square shaped applicators starting from 6x6, 10x10, 15x15, 20x20 25x25 and 1 rectangular applicator 10x6. We dont provide any circular applicator.	Should include Monte Carlo dose calculation for Electrons module with possibility to have Calculation of electron beams of 4-30 Mev from linear accelerators and support of Support from

			Square and rectangular applicators
23	The vendor shall provide also Montecarlo photon based planning algorithm module for IMRT,VMAT/Rapid Arc and Dynamic conformal ARC.	Vendor specific algorithm. please amend as "Montecarlo or equivalent algorithm"	The photon beam algorithm shall use advanced kernel method such as convolution/superimposition Boltzmann transport. It should be ACUROS or Monte Carlo based
23	Should be able to do Precision Dual Arc technique with back and forth gantry motion	Please provide more details on this	No change
23	Connectivity : The TPS should be of the latest & able to network with the like any vendor linac, Radiotherapy Simulator and diagnostic CT system etc.	Please elaborate the requirements	The treatment planning system should be of the latest & able to network with linear accelerators, CT simulator, MRI, and PET CT of any vendor available in the department.
25	4D advanced patient monitoring device Marker Free, Surface sacn base gating system for patient monitoring in LA Room (With its specifications)	It seems SGRT is already asked in below Optional items no.4. But here it seems asked as mandatory. both are conflicting. Gated treatment feature has already been asked in 22 point b. This is a repetition. We offer the prospective/ retrospective gating functionality through the combination RGSC and RPM. kindly remove Free breathing gating from marker free	Amended as “ 4D advanced patient monitoring device Respiratory motion management system: A. An active breathing monitoring and control system to perform both

		<p>or add either/ or For 4D CT, RGSC is siemens's solution which has already been asked in 22 point no. b. Kindly clarify if the need is surface monitoring or 4D CT acquisition here</p>	<p>active breathhold image acquisition and treatment and also for automated respiratory gating treatment including gated VMAT shall be provided with necessary gating system and gating interface system.</p> <p>Shall provide two portable system and the same should be allow it to be used in LINAC treatment and CT simulator imaging room.</p> <p>System shall be of latest, advanced model commercially available with audio-video coaching device monitor for better breathing pattern reproducibility.</p> <p>Or</p>
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			<p>B. Respiratory synchronized system for respiratory synchronized image acquisition and prospective and introspective gated treatment shall be provided. System shall be of latest, advanced model commercially available with audio-video coaching device monitor for better breathing pattern reproducibility. Shall provide two portable system and the same should be allow it to be used in LINAC treatment and CT simulator imaging room.</p>
25	<p>Measurement Reproducibility :0.2 mm,Long term stability:Within 0.3 mm and Scan speed shall be atleast 50 contours per second and for a 40 cm</p>	<p>Measurement reproducibility which is asked under the point no 25 is not related to SGRT. Kindly provide the actual requirements or please clarify.</p>	<p>deleted</p>

	scan the time taken shall not be more than Typically 1-2 sec.Positioning accuracy is within 1 mm for rigid body and Motion detection accuracy is within 1 mm.		
	Also there will be external microMLC which shall have 3mm leaf size or less for use advanced SRS.	we dont have external microMLC,this is vendor specific term. we have our integrated 2.5 mm HDMLC or/5 mm MLC.Request you to amend this point	Clarified in point no. 18.a
	Option 2:4D Image Guidance (With its specifications)	We have noticed that the specification of 4DCBCT are completely one vendor specific. Hence request you to amend the general specification,so that all the vendors can participate in this tender.	The required specification of this item is added in para 22 and optional item Option 2:4D Image Guidance (With its specifications is deleted
	Option 5 :- High End Patient positioning system on Linear Accelerator meant for Real Time Image Guided Radiotherapy ,Frameless Radiosurgery & Stereotactic Body Radiotherapy Treatment.	Please elaborate the requirement.	optional item Option 5 With its specifications is deleted
	Room based real-time IGRT System (Patient positioning and tracking platform) (With its specifications)	We have noticed that under point no.19 the couch is asked as 6D couch and this point it is asked as upgrade from 4DOF to 6DOF which is conflicting the requirement.Hence request you to kindly clarify the exact requirement.	(deleted)

	The system shall have the capability to calculate and generate the shift values,which can then be entered into robotic couch top for 6D corrections to happen based on these values with the existing hexapod system	The system shall have the capability to calculate and generate the shift values,which can then be entered into robotic couch top for 6D corrections to happen based on these values with the existing hexapod system -does it means this is upgrade of existing 4D couch to 6D couch?.If it so,we cannot provide the same.	(deleted)
26	Dosimetry and QA		
26	<p>RADIATION THERAPY BEAM ANALYZER:</p> <p>Require a full-fledged three-dimensional Water Phantom & Dosimetry system and therapy beam analyzer for performing Off-axis profiles, PDD, point dose measurement, beam symmetry tuning, Dose rate constancy check, vector scan and TG51 lead foil measurement for low and high energy Photon and electrons. All the measurements should be computer controlled and user friendly. All components comply with national and international regulations and safety</p>	<p>Require a latest launched full-fledged three dimensional Water Phantom & Dosimetry system and therapy beam analyzer for performing Off-axis profiles, PDD, point dose measurement, beam symmetry tuning, Dose rate constancy check, vector scan and TG51 lead foil measurement for low and high energy Photon and electrons.</p> <p>All the measures should be computer and wireless remote controlled and user friendly. All components including TPR kit and in – built T&P sensors comply with national and international regulations and safety rules. All components of the system and all available options such as router, TPR kit, Wi – fi transmitter are</p>	<p>The following points shall be added:</p> <ol style="list-style-type: none"> 1. The supplier should quote advanced and latest system in complete set in details including make and model for reference or absolute dosimetry equipments, relative dosimetry equipments, machine and patient specific QA equipment, radiation safety equipment, and Film dosimetry equipment. 2. All the dosimetry systems should follow the latest

	<p>rules. All components of the system and all available options are controlled by the same software that runs under Microsoft Windows of the latest version of window 2000 and window XP. The system should be suitable to measure pulsed radiation with fluctuation dose rate.</p>	<p>controlled by the same software that runs under Microsoft Windows of the latest version of windows.</p> <p>The system should be suitable to measure pulsed radiation with fluctuation dose rate.</p> <p>Justification: Dosimetry equipment requires capital expenditure and shall work as long as LINACs is working for the treatment. Therefore, the latest launched models ensure a long-term availability of spare – parts, and services. It also comes with the latest and updated design & technology. The latest 3D RFAs incorporate wireless operations for mechanical set – up and data transfer. It helps setting up RFA with auto – guided i.e., step by step mechanism. TPR kit (hardware & software) is necessary to measure actual or real –time TPR.</p>	<p>national and international regulatory protocols.</p> <ol style="list-style-type: none"> 3. The radiation field analyzer and dosimetry system should have advanced and latest model. 4. The RFA system preferably should have wireless function, paperless SSD positioning and wireless control pendent. 5. All necessary QA Phantoms required for kV /MV imaging system. 6. The system consist of Farmer type ionization chamber, PMMA or brass buildup caps for all photon energy, plane parallel ionization chamber, reference class electrometer, BNC & TNC connector, small field dosimetry (0.07 cc or equivalent) system, 1D
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			<p>water phantom and solid slab phantom.</p> <p>7. The radiation beam data acquisition system shall consists of 3 D scanning water phantom(square, rectangular and cylindrical), lift table, water reservoir, dual electrometer, beam data acquisition software, control system, two 0.125 cc or equivalent water proof ion chamber along with holders, and BNC and TNC tri axial cables.</p> <p>8. Permanent cabling between LINAC treatment room and control room shall be provided for dosimetry.</p> <p>9. Film dosimetry system consists of film scanner along with necessary hardware and software for</p>
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			<p>dosimetry, quality assurance and commissioning of the LINAC system and routine QA. Self developing radiochromic and gafchromic film of sensitivity up to 20 Gy (30 No. every year for first five year) shall be provided.</p> <p>10. Calibrated portable ionization chamber based survey meter and Neutron survey meter as per ICRP requirement shall be provided.</p> <p>11. Machine daily QA system shall consists of chamber based QA device to perform x-ray and electron output, flatness and symmetry of beam profile, beam energy consistency, test etc for different field size.</p>
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			<p>Necessary hardware and software shall be provided.</p> <p>12. Patient specific QA system shall consist 3D cylindrical phantom and 2D ion chamber or diode array based detector with software based system for verification of IMRT and VMAT FFF beam, SRS and SBRT beam. It should have advanced comparison and evaluation tools including local and global gamma volume analysis.</p>
	<p>CHAMBER: Necessary thimble ionization chamber should be there for measurement of filed and reference signal. A parallel plane chamber should be there for electron measurement. The necessary holding devices and extension cales for the above chambers must be included. The chamber specification should be</p>	<p>Necessary 3D thimble ionization chamber should be there for measurement of filed and reference signal.</p> <p>A parallel plane chamber should be there for electron measurement. The necessary holding devices and extension cales for the above chambers must be included. The chamber specification should be quoted. The position</p>	<p>No change</p>

<p>quoted. The position accuracy should be better than ± 0.1 mm. The chambers should be properly calibrated and given necessary calibration certificates. The positioning tool should be there to allow easy and exact positioning of the chamber's geometrical center in the central beam and at the water surface. Apart from this the exact position of the chamber in the radiation beam should be possible via software. The detector unit should be driven by stepper motor and step length should be adjustable in steps of 0.1 mm. The scanning speed should be adjustable between 5mm/s and 50mm/s small steps. Further the delay times for each step should also be adjustable by the user. The acceleration of the step movement should also be changed as and when required. The system should allow simultaneous movement in available direction for any vector scan. The zero point, reference point and</p>	<p>accuracy should be better than ± 0.1 mm. The chambers should be properly calibrated and given necessary calibration certificates. The paperless SSD positioning tool should be there to allow easy and exact positioning of the chamber's geometrical center in the central beam and at the water surface. Apart from this the exact position of the chamber in the radiation beam should be possible via software. The detector unit should be driven by DC stepper motor and step length should be adjustable in steps of 0.1 mm. The scanning speed should be adjustable between 5mm/s and 50mm/s small steps. Further the delay times for each step should also be adjustable by the user. The acceleration of the step movement should also be changed as and when required. The system should allow simultaneous movement in available direction for any vector scan. The zero point, reference point and limit of the different detector units should be stored separately and permanently in the control unit. The wireless control pendant should display the actual position of the chamber position at any given</p>	
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	<p>limit of the different detector units should be stored separately and permanently in the control unit. The control pendant should display the actual position of the chamber position at any given measuring time.</p>	<p>measuring time. Justification: 3D technology in ion – chambers gives flexibility to mount field chambers both in radial and axial manner. This brings sharp penumbra, less STEM effect i.e., less leakage current with 3D ion chambers. DC Stepper – motor does not require frequent calibrations i.e., each step of such motors doesn't require complex calculations or tuning to work. Stepper motors offer precise positioning and repeatability of movement over servo or any other motors. Stepper motors have full torque at standstill and offer good torque at low speeds. There are many studies prove that modern stepper drives can produce smooth, low-speed motion with up to 51,200 steps per revolution.</p>	
	<p>Water Reservoir: The water reservoir should be large enough to store the water and can be pumped and drained to the water phantom as quickly as possible. The water reservoir must be able to hold the entire weight of the water without any change. The weight of the whole</p>	<p>The integrated water reservoir should be large enough to store the water and can be pumped into and drained from the water phantom as quickly as possible with an inclined bottom. The integrated water reservoir must be able to hold the entire weight of the water without any change. The weight of the whole assembly can push or pull</p>	<p>No change</p>

<p>assembly can be push or pull through the wheel with polyethylene or equivalent. The lifting carriage should be electromechanical/elevating screws mechanism that keeps the height absolutely accurate. The lifting carriage and water reservoir must be imported and directly from the suppliers and must be complete with all facilities including TPR and TMR measurements. Completely intergraded Lifting Carriage and Water Reservoir. The Water Reservoir must be compatible with TPR measurements and hence for TPR measurements the pump of the reservoir should drive automatically, and electromagnetic valves make sure that no water can flow the phantom tank to the reservoir during automatic TPR measurement. The Water reservoir should have a safe circuit that avoids the dry pump running control unit/Electrometer.</p>	<p>through the 360° wheel with polyethylene or equivalent. The lifting carriage should be electromechanical that keeps the height absolutely accurate. The lifting carriage and water reservoir must be imported directly from the suppliers and must be complete with all facilities including TPR and TMR measurements, in-built T&P sensors, and paperless SSD tool. Completely intergraded Lifting Carriage and Water Reservoir. The Water Reservoir must be compatible with TPR measurements and hence for TPR measurements the pump of the reservoir should drive automatically, and electromagnetic valves make sure that no water can flow the phantom tank to the reservoir during automatic TPR measurement. The Water reservoir should have a safe circuit that avoids the dry pump running control unit/Electrometer.</p> <p>Justification: The latest design and launched RFA comes with integrated facility so that human error whilst mechanical set - up becomes negligible or zero. The improvements</p>	
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		<p>and latest innovations have discovered 360° wheels, inclined bottom for water drainage, Paperless SSD tools, in – built T&P sensors – TPR kit, 3D ion – chambers, wi – fi transmitter, router based communications and data transfer. All the above are the technology and certainly do not define any product. Looking at capital expenses and longterm uses of dosimetry equipment, latest innovations have become mandatory.</p>	
	<p>A separate control unit for controlling the movement of the detector in any three directions should be possible. A separate electrometer to collect the ions/dose from the chamber/detector should be there. The voltage to the chamber should be adjusted in the electrometer in steps of 50 V. The polarity of the chamber should be logged between +/- . The electrometer should also be able to measure absolute dose for low and high energy photon and electron. The gain of the electrometer should be automatic</p>	<p>An integrated control unit for controlling the movement of the detector in any three directions should be possible. A separate electrometer to collect the ions/dose from the chamber/detector should be there. The voltage to the chamber should be adjusted in the electrometer in steps of 50 V. The polarity of the chamber should be logged between +/- . The electrometer should also be able to measure absolute dose for low and high energy photon and electron. The gain of the electrometer should be automatic depending upon the signal collected by the field and An integrated control unit for controlling the movement of the detector in any three directions should be</p>	<p>No change</p>

	<p>depending upon the signal collected by the field and reference detector. Further the user should also be given an option to change the gain to field and reference separately. Necessary software to use the electrometer for absolute measurements should be provided. The time constant should allow 10ms measurement times. The external dosimeter should also be connected to the water phantom. The control unit should permanently store zero-point, reference point and limit points for water phantom, air scanner and mechanical film densitometer separately. These different sets of limits, zero and reference points, can be retrieved independently. The Co-ordinates of the probe should display for all directions, simultaneously on a control pendant. The control pendant can be attached either to the water tank or to the control unit.</p>	<p>possible. A separate electrometer to collect the ions/dose from the chamber/detector should be there. The voltage to the chamber should be adjusted in the electrometer in steps of 50 V. The polarity of the chamber should be logged between +/- . The electrometer should also be able to measure absolute dose for low and high energy photon and electron. The gain of the electrometer should be automatic depending upon the signal collected by the field and reference detector. Further the user should also be given an option to change the gain to field and reference separately. Necessary software to use the RFA system for absolute measurements should be provided. The time constant should allow 10ms measurement times. The external / integrated dosimeter should also be connected to the water phantom. The control unit should permanently store zero-point, reference point and limit points for water phantom, air scanner and mechanical film densitometer separately. These different sets of limits, zero and reference points, can be retrieved independently.</p>	
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	<p>The communication between the control units and the computer should be performed by a standard RS232 interface.</p>	<p>The Co-ordinates of the probe should display for all directions, simultaneously on a control pendant. The wireless control pendant and data transfer can be connected / performed to water phantom through in – built / external Wi – fi transmitter to control unit</p> <p>The communication and data transfer between the control units and the computer should be performed by a standard RS232 interface / LAN cable and the router.</p>	
	<p>The high voltage for the probe should be switchable independently for each decreased in different voltage and sign of the measuring signal can be reserved. A solid, water equivalent phantom makes up of slabs of different thickness shall be provided by the vendor for external beam teletherapy dosimetry. It shall be possible to use this phantom for both photon and electron beam dosimetry. The phantom shall be free of contaminants and air bubbles. The</p>	<p>The high voltage for the probe should be switchable independently for each decreased in different voltage and sign of the measuring signal can be reserved. A solid, water equivalent phantom makes up of slabs of different thickness shall be provided by the vendor for external beam teletherapy dosimetry. It shall be possible to use this phantom for both photon and electron beam dosimetry. The phantom shall be free of contaminants and air bubbles.</p>	<p>The high voltage for the probe should be switchable independently for each decreased in different voltage and sign of the measuring signal can be reserved. A solid, water equivalent phantom makes up of slabs of different thickness shall be provided by the vendor for external beam teletherapy dosimetry. It shall be possible to use this phantom for both photon and electron beam dosimetry. The phantom shall be</p>

	slab shall be 30 x 30 cm or more size, totaling a thickness of 30 cm.	The slab shall be 30 x 30 cm or more size, totaling a thickness of 30 cm.	free of contaminants and air bubbles. The slab shall be 30 x 30 cm or more size, totaling a thickness of 30 cm.
	<p>Control Computer:</p> <p>The latest version of windows computer should have all the latest feature with color monitor and with printer/plotter (color) and branded UPS (45 min, back-up).</p>	<p>The latest version of windows computer / laptop should have all the latest feature with color monitor and with printer/plotter (color) and branded UPS or power back – up (45 min, back-up).</p> <p>Justification: Now a days, advanced and business model laptops are being provided. It is easy to carry and portable. The laptop itself has power back- up for 45 min. or more.</p>	No change
	<p>ARRAY DETECTOR:</p> <p>One Array device must be based on ion chamber array resulting in an effective measuring field of 27 cm x 27cm and giving the facility to use with slab phantom for measurement. The chamber must be a vented plane-parallel square shaped ion chambers with 5mm x 5mm x 5mm size and center to center spacing must be 10mm. It should be able to be used for the dose verification of IMRT beams</p>	<p>The detector should always be perpendicular to the beam & thus remove the angular dependence. Dose distribution, fluence and absolute dose must be measured and collected always at true iso – center levels</p> <p>Justification: The technical specs look okay and justified as they are. New innovations and the latest improvements have made it possible to achieve effective measurements with the maximum field size and rotational phantoms mentioned.</p>	

<p>and routine quality control of high energy photon and electron beams by using the software and it should be able to check the MLC leaf positioning. It should be able to measure the dose from dynamic and static fields in one run and display the readings in both dose rate and absorbed dose mode. It should be able to perform the QA for high energy beams and dose verification for IMRT, IMAT, and ARC beam techniques. It should be capable of doing complete pretreatment patient plan verification with one measurement Cylindrical & Rotational Phantom with inclinometer, lifting trolley & complete drive assembly with related software module for VMAT dynamic IMRT techniques. There should be a slot & provision to insert the 2D Ion Detector Array System into the Rotational Phantom for taking synchronous measurements with the Linac</p>	<p>The objective of removing angular dependency and array perpendicular to radiation beam is the need of the hour. In the due course, fluence measurement, dose distribution and collection must be at iso – center levels.</p>	
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	<p>Gantry Rotation.</p> <p>The detector should always be perpendicular to the beam & thus remove the angular dependence. The software should have functionality like 3D volume analysis and CT overlay. One additional Array Device with 900 or above liquid filled ionization chamber for patient plan verification & quality control of small fields. Detector spacing should be 2.5 mm & the maximum field size should be above 10 x 10 cm & below 12 x 12 cm essentially for use with small field dosimetry. This Array device should also be usable for Stereotaxy work. This Array device should be usable with the Cylindrical & Rotational Phantom. One Parallel plate chamber for electron dosimetry, one number of pinpoint chambers for small field dosimetry along with the calibration certificate for all these</p>		
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	chambers. Calibrated Barometer and Thermometer to be included.		
	4 D Advance Patient Mentoring Devices	<p>The specifications are quite old and there has been a lot of advancement in the product portfolio.</p> <p>We request you to delete the entire specifications under the above-mentioned point 25 of page 138-139 with sub-headings: (bidder has given its own specs)</p>	optional item Option 4 With its specifications is deleted

Sr No.	Turn key work	Added para to HELA (Advanced high energy Linear Accelerator)
1	Designated Rooms and total covered area (m ²)	LINAC Treatment room, control room, Chiller room & UPS, Maze area, AHU room, Treatment planning system room, mould room Total ground floor covered area= 180 sq. meter
	Furniture:	
	Revolving chairs height adjustable, medium-back with hand rest-	6 nos.
	Chairs for patient waiting area-Three setter (chrome plated).-	4 nos.
	Cupboard with laminate door shutters for storage of spare parts and accessories and records as per requirement -	4 Nos
	Drug trolleys for patient preparation areas-	1 Nos
	Patient trolley with rubber foam mattress to be kept in the patient preparation room-	2 Nos.
	Name boards for all rooms. All the rooms in the complex will be signposted	
	Sun film and ventilation blinds will be put up in all windows	If applicable
	Tables for all Workstation	
	Changing rooms should have change lockers and dressing table	
	Dustbins (plastic with lid)-	10 nos

ITEM NO. 4

REVISED TECHNICAL SPECIFICATION LOW ENERGY LINEAR ACCELERATOR SYSTEM

A. General:

Tenders are invited directly from the manufacturers/principles to supply, install and maintain the State-of-the Art Advanced Single low Energy (6MV) Linear Accelerator (LINAC) system for the Department of Radiation Oncology, Pt. DDU UHS Kutail. The Advanced Single low Energy Linear Accelerator system shall be gantry-based or ring-based LINAC system. The system will be installed in the room which has already been constructed as per the AERB approved layout plan for high energy linear accelerator. Hence, the supplier of ring based LINAC system should ensure the feasibility of the installation and operation of ring based LINAC system. The LINAC system having photon beam radiation equipped with a multileaf collimator (MLC) and kilovoltage cone-beam and other features to perform various radiation treatment techniques such as three-dimensional conformal radiotherapy (3D-CRT), intensity modulated radiation therapy (IMRT), and Volumetric modulated arc therapy (VMAT), image-guided radiotherapy (IGRT). The LINAC system includes linear accelerator (LINAC), treatment planning system (TPS), oncology information system (OIS), dosimetry and quality assurance equipment and patient positioning and immobilization devices with scope of turnkey work for site modification.

B. Equipment Safety, Standards and general Requirements:

1. The offered linear accelerator model shall be of FDA (USA) and CE (Europe) certified medical device.
2. The offered linear accelerator model shall be of Atomic Energy Regulatory Board (AERB) national radiation safety regulatory body type-approved equipment.
3. The offered linear accelerator model shall have all IEC compliance of LINAC in terms of coordinates and scales as per IEC 1217 nomenclature and standard and also adherence to international basic safety standards apply to all medical equipment that produce ionizing radiation.
4. It should be capable of integrating with standard networking and PACS systems available in the market.
5. The offered linear accelerator model should have been installed in at least 2 (preferably five) cancer centers/hospitals across in India

with more than 1 year of clinical operations at the time of bidding.

6. The system will be installed in the room which has already been constructed as per the AERB approved layout plan for high energy linear accelerator. Hence, the supplier of ring based LINAC system should ensure the feasibility of the installation and operation of ring based LINAC system.
7. The LINAC room has been constructed in the basement, hence the supplier should exercise and ensure about water proofing for the safety of the equipment under the turn-key work.

C. Technical Specifications of LINAC system

a) General specification:

1. LINAC Type: Gantry based /Ring based linear accelerator
2. Photon Energy: 6 MV FF/ 6MV FFF (Low Energy Photon)
3. RF Source: Magnetron / Klystron as radiofrequency (RF) micropower source
4. Waveguide Type: Standing / Travelling wave (specify)
5. Electron Gun and focal spot: Sealed /Unsealed(specify)
6. Treatment Modes: Normal - TSD / TAD Rotation – CW/CCW
7. Dose-Rate: 800 MU/min or higher dose rates, please specify
8. Field Size (clipped): For photons: Max- 35 x 35 cm² or More Min- 1 x 1 cm²
 - i. Max – 30 x 30cm² More Min- 2 x 2 cm² (for ring based)
9. Field Size (Unclipped): 40x40cm² / 28x28cm² or more for ring based linac
10. Penumbra for 10 x 10 cm² field at 10 cm depth shall be <7mm
11. Beam symmetry/Flatness: In radiation beams, the beam symmetry shall be less than or equal to 2% and the flatness less than or equal to 3%. As per AERB protocol.
12. ARC - CW / CCW Dose rate- MU/degree
13. Photon Arc Therapy: Bidirectional arc therapy should be included with Automatic calculation of Dose per degree based on the Dose Rate and the Arc angle set
14. Source to axis distance (SAD) : Should be 100cm
15. Gantry Aperture size (Diameter) :100 cm or more (ring based LINAC)
16. Built-in chambers. Two separate sealed chambers Precision ± 1% or 1 MU Linearity + I% or I MU Reproducibility ± 2% or 1 MU

Dose Rate Dependence

b) Gantry Specification:

1. Rotation range: $\pm 180^\circ$ min (360° total)
2. Gantry Rotation Speed: specify
3. Rotation Per Minute: specify
4. Read out - Digital / Mechanical
5. Accuracy digital -readout $\pm 0.5^\circ$
6. Control - Hand pendent and control-console
7. Target - Axis Distance - $100 \pm 0.2\text{cm}$
8. ODI Range and accuracy: 75 cm to 150 cm Accuracy ± 0.1 cm (gantry based) or specify
9. Mechanical to Radiation isocenter accuracy: specify
10. Gantry Rotation Isocentre 2 mm dia. Sphere
11. Patient positioning Laser System: Inbuild Three lasers co-align to the virtual isocenter should be provided (ring based LINAC)
12. Gantry Bore Collision Sensor: Sensor should be Provided

c) **Collimator specification:**

1. Rotation - $\pm 165^\circ$ or more about mid position / ± 90 degrees (ring based LINAC)
2. Control - Hand pendent and control - console
3. Readout accuracy - $\pm 0.5^\circ$
4. Collimator Rotation Isocentre ≤ 2 mm dia. Sphere
5. Collimator (degrees) rotation reproducibility: specify
6. Collimator rotation speed (RPM) (Maximum):specify

d) **Asymmetric Collimators** X & Y both Asymmetrical

Specify travel ranges & over travel range

Penumbra (specify)

Coincidence of light & x-ray field

e) **Multi-leaf collimator** (MLC) specification:

1. Type of MLC : Single layer/Double layer

2. No. of Physical Leaves - 120 or above for gantry based, (specify in case of ring based LINAC)
3. Leaf Width at isocenter: Effective 0.5 cm
4. Independent drives
5. Capable of performing conformal therapy, IMRT, VMAT procedures.
6. Specify Intra-leaf & inter-leaf leakage (Should be as per AERB protocol)
7. MLC, Field Size: Specify
8. Leaf material Composition :Leaf material composition should be tungsten
9. Leaf Height : specify
10. Transmission
11. Maximum leaf speed
12. Leaves Positional Accuracy
13. Interface between MLC & R&V System.
14. Max. leaf retracting position
15. High over centre travel of MLC leaves (>10 cm) for conformal treatments
16. Max. carriage speed
17. Max. leaf speed

f) **Treatment Couch:**

1. Versatile extended range couch with indexed immobilization Movements:
2. Specify couch top width (cm) and Couch top length (cm)
3. couch top bearing capacity : Minimum 200 Kg
4. Longitudinal, Lateral, Vertical and Rotation motion range (specify)
5. Degrees of freedom : 3
6. Fully Carbon Fiber table top for better Quality Portal images
7. 6 MV attenuation (%) :1.9%
8. Electrical / Mechanical Control
9. Control-Local and/or Remote
10. Minimum couch height from floor app 63 cm

g) **Portal Imaging**

1. Imaging source: kV and MV x-rays
2. Detectors: Amorphous silicon flat panel detector should be provided
3. Imaging Area and resolution :Min 43X43 cm with 1280 X 1280 resolution (or specify)
4. MV / KV DRR Latest software to analyze MV / KV DRR
5. Integrated portal dosimetry :Fully integrated portal dosimetry for patient specific QA should be offered

h) IGRT System

1. Imaging Capabilities: kV CBCT (iterative CBCT) and all other imaging capabilities/ features (2D and 3D) available with the quoted machine model should be provided.
2. Image acquiring: The images acquired should be fully integrated with the existing OIS system and compatible with the supplied and existing TPS

i) Beam stopper

In case of ring based LINAC, Integrated In-built primary-beam shielding with adequate thickness to attenuate primary beam should be offered as per NCRP report No. 151

D. Treatment Planning System

- a) Fully DICOM compatible treatment planning system (TPS) shall be provided.
 - b) TPS shall supply with two work station for virtual simulation and dose calculation licenses.
 - c) The supplied TPS should be able to plan 3DCRT, IMRT, and VMAT for above LINAC and the other LINAC machines to be installed in the department.
 - d) Supports any one or more dose calculation algorithm such as Monte Carlo or anisotropic analytical algorithm or collapsed cone convolution algorithm for photons (specify).
 - e) TPS shall provide all dose optimization algorithms (including biological optimization)
 - f) The TPS software shall run on a very powerful, graphics intensive computer system with adequate, latest backup technology. The system shall have high capacity hard disks.
 - g) Various dosimetric data for 3D CRT and MLC fields must be transferred from RFA.
- a) The patient image data must be transferred from CT simulator, MRI, SPET CT.
 - b) Image Registration rigid /deformable and contouring features to be provided
 - c) Atlas and model-based auto contouring to be provided
 - d) The system must have auto contouring of external and internal organs from CT/MRI images either taken from CT/MRI film or

via other mode of data transfer as mentioned above.

- e) Geometric Planning: System must have auto contouring of organs. After dose prescription and Fractionation scheme system must create geometric treatment plan with 3-D visualization and virtual simulation.
- f) Dose optimization: System should have provision to generate the treatment plans from templates that satisfy the organ dose constraints, Following steps should be taken:
 - 1. Define dose volume constraints
 - 2. Set optimization parameters.
 - 3. Evaluate optimization
- g) Dose Calculation: System should be able to provide dynamic/Step and shoot IMRT and VMAT treatment planning & license for Fluence map to be exported on DICOM-RT format. The necessary interfaces for transfer of treatment plans to any Linear Accelerator should be provided. The final dose distribution is calculated as per selected dose delivery technique.
- h) Plan, Review & Evaluation: It must provide 3-D dose visualization and differential & cumulative DVH analysis tools to review the plan.
- i) Networking: Import / export – Image / structure set / treatment plans (3DCRT/IMRT/VMAT) / dose and others to all machines and integration with the network. (HW/SW)
- j) Printer: Monochrome network duplex Laser Printer to be provided. Should be supplied with 5 cartridges per year during warranty and CMC period.

E. Oncology Information System:

Advanced Oncology Information System (OIS) complete with networking and sufficient number of licenses shall be supplied. The features of OIS include:

- a) Record and verify system
- a) Transfer of all parameters from CT-simulator, MRI, PET-CT, etc, to Treatment Planning System for
- b) Transfer of all parameters from Treatment Planning System to the linear accelerator for automatic treatment setup and delivery.
- c) Transfer of DRR/fluoroscopy imaged from CT simulator to portal imaging system for comparison
- d) Transfer & execution of MLC position parameters for 3DCRT, IMRT and VMAT from treatment planning to treatment units.

F. Dosimetry and QA Phantoms

- a) Calibrated portable ionization chamber based survey meter shall be provided.
- b) The absolute dosimetry system consist of Farmer type ionization chamber, PMMA or brass buildup caps, reference class

electrometer, BNC & TNC connector, small field dosimetry (0.07 cc or equivalent) system, 1D water phantom and solid slab phantom.

- c) Permanent cabling between LINAC treatment room and control room shall be provided for dosimetry.
- d) All necessary QA Phantoms for kV imaging, IGRT, and machine QA should be supplied.
- e) Technical and functional details of the items shall be submitted in the technical quote.
- f) CAT phantom for KV CBCT
- g) MPC drum and roll (as applicable).
- h) Self-check to verify the coincidence between treatment isocenter and MV / KV imaging isocenters
- i) Self-check to verify all mechanical axes remain within product specification.
- j) Self-check to verify beam center shift and output and profile constancy checks
- k) Self-check to verify MLC leaf position, jaws, couch, and gantry position accuracies.
- l) Machine Dedicated QA device for daily, weekly, and Monthly QA
- m) Patient-specific QA device for IMRT/VMAT
- n) Full range of Quality Assurance tools/software application should be included

G. H/W and Software

- a) Upgradation The offered model should be designed in a way that it should support upgrade with additional features in the later period.
- b) Equipment shall be supplied with the latest available hardware and software features released in the country of origin at the time of installation to meet the required technical specifications.
- c) Supplier shall provide mandatory software updates free of cost during warranty / CAMC period to keep the system updated.

H. System Configuration Accessories, spares and consumables

- a) Consumable required for installation and standardization of system to be given free of cost.
- b) The Chiller system shall be provided along with the machine by the principals.
- c) A closed - circuit color TV system with TV monitors and two cameras in the linac treatment room shall be supplied.
- d) A patient calling system with 6 channels shall be supplied. Internet broad band connectivity for remote servicing shall be provided.

I. Environmental factors

Complete installation should include:

- a) Electrical Requirements to be specified
- b) All AERB Clearances and Environmental clearances to be arranged with local authorities. Institute will provide all the documentations.
- c) Cooling water temperature, flow and pressure monitoring to be installed.
- d) Air Conditioning and monitoring of Temperature; Relative Humidity and Air Changes (To specify no. per hour) to be installed.
- e) The unit shall be capable of being stored continuously in ambient temperature of 0-50 deg C and relative humidity of 15-90%
- f) The unit shall be capable of operating in ambient temperature of 20-30 deg C and relative humidity of less than 70%

33. Training

Training to be imparted on the equipments as follows:

- Two weeks on applications in a developed facility where the Linac is being extensively used in India.
- Two department technician to be trained on operating procedures on the system for one week. In all the case certificates has to be provided to the trained persons and a copy to be attached while claiming balance payment.

Sr No.	Turn key work	Low energy Linear Accelerator)
1	Designated Rooms and total covered area (m ²)	LINAC Treatment room-2, control room-2, Chillor room & UPS (5.2 x 3.18), Maze-2 area, AHU room (10.55 x 5.15 m ²) Total ground floor covered area= 154.83 sq. meter
	Furniture:	
	Revolving chairs height adjustable, medium-back with hand rest-	6 nos.
	Chairs for patient waiting area-Three setter (chrome plated).-	4 nos.
	Cupboard with laminate door shutters for storage of spare parts and accessories and records as per requirement -	4 Nos
	Drug trolleys for patient preparation areas-	1 Nos
	Patient trolley with rubber foam mattress to be kept in the patient preparation room-	2 Nos.
	Name boards for all rooms. All the rooms in the complex will be signposted	

	Sun film and ventilation blinds will be put up in all windows	If applicable
	Tables for all Workstation	
	Changing rooms should have change lockers and dressing table	
	Dustbins (plastic with lid)-	10 nos

Site Modification of Facility under the scope of Turnkey Work

The Supplier should inspect the proposed site where in the proposed Low energy Linear Accelerator machine has to be installed. They are required to prepare and submit plan for the project after consultation with engineering in charge and user departments. The scope of turnkey work includes complete Civil, Electrical, Air-conditioning and Plumbing for the proper functioning of the equipment. The supplier shall assist the user by facilitating necessary documentations/technical data for regulatory clearances and approvals from AERB. The cost of the facility site modification work should be quoted separately and this cost will be considered for L1 calculation. The bidder shall be responsible for construction / modification work including construction of brick wall if any, plastering, flooring as per the approved plan and equipment layout plan. Vendor will have to quote for the following components of Site Modification work. Civil modifications

- Electrical work
- Air conditioning (HVAC)
- Flooring Wall Finishing & Painting
- False Ceiling Plumbing.

The system Low energy Linear Accelerator machine should be installed and handed over in working condition with all necessary electrical, wall finishing, air conditioning, flooring and plumbing work undertaken by the vendor in consultation with the user dept. Furniture like desks, chairs, shelves etc. Air conditioning of the facility and the price quoted for HVAC is included for L1 calculation of the bids. The supplier shall be required to specify the total load requirements for the Low energy Linear Accelerator machine facility including the load of air conditioning, room lighting and for the accessories if any. The bidder may quote the unit rates of any other site modification work activity which is not mentioned in the list. All outdoor units should be installed in approved space on concrete base and covered by steel frame. The installation of air conditioning work should be done in consultation with engineering in charge and user departments. The site modification work should be designed and built to prevent rodent entry.

ITEM NO. 5 - 1.5 TESLA MR LINEAR ACCELERATOR

- The **1.5 Tesla MR Linear Accelerator** excluded from the current procurement scope (Stands Delete) and deferred to **Phase II** for consideration.

ITEM NO. 6 16 SLICE DUAL HEAD SPECT/CT SCANNER

Sl. No.	Tender Specification	Amendment Request Clarification/ Reason for Amendment	Justification	Decision of Technical Committee
	CT Specification : Point no.: vii Tube current 20-200 mA	Tube current 5-400 mA or better	For better image quality, from the latest technology. The current 20200 mArange for SPECT CT specifications is from old models. For futureproofing And adopting The latest technology, we request to update it to 5-400 mA or higher	10-200 or Better
	CT Specification : Point no.: ix : Anode heat storage capacity: 2.0 MHU or more	Anode heat storage capacity: 3.5 MHU or more	For better image quality, latest technology, ensuring better functioning for a longer period because of better heat dissipation rate.	No Change
	CT Specification : Point no.: I The system should be enabled with Fast rotation CT scanner with full rotation multiple rows of 16 or more channels capable of 16 Slices or more per rotation.	No Change Required	Same reasons as above (to ensure latest technology)	No Change

	CT Specification : Point no.: vi Continuous generator to support sustained and continuous X-ray generation. continuous X-ray generation. The Generator capacity should be 50K W or more.	No Change Required	Same reasons as above (to have latest technology)	No Change
Annexure-1 Point-I Pg-160	A latest technology dual head variable angle SPECT/CT system with 16 slice CT for commissioning by the company.	SPECT CT with 16 slice acquisition integrated with 16 or more physical rows.	Higher number of detector rows with higher number CT slices results in good and faster diagnostic image quality. This will also help in maintaining the uniformity across all vendors. Request you to please amend as mentioned.	A latest technology dual head variable angle SPECT/CT system with 16 Slice acquisition with 16 or more physical rows.
Annexure-1 2. Gantry Point-I Pg-161	Integrated SPECT/CT gantry with 70cm bore size and 50cm CT scan FOV for large patient size.	SPECT/CT system should have Single integrated CT and SPECT gantry into a single gantry without any gap with 70cm bore size and 50cm CT scan FOV for large patient size..	Integrated gantry will need less room space compared to other OEM having two separate gantry for SPECT & CT. This will provide better co-registration of fused images and also help in maintaining the uniformity across all vendors.	No Change

Annexure-1	Please add this point.	Metal Artifact Reduction software should be provided.	Metal Artifact Reduction improves the diagnostic image quality and enhance visualization of the tissues and structures surrounding metal implants e.g., prostheses, and dental fillings in CT scans. Majorly utilized in bone SPECT/CT scans but also in other SPECT/CT scans. MAR helps clinician to decide on infection vs inflammation in case of orthopedic cases.	No Change
9. Clinical application software Point-xxvii Pg-167 Annexure-1			Request you to please amend as mentioned.	No Change
9. Clinical application software Point-xxix Pg-167	Application enabling OLINDA based dosimetry & quantification software along with workstation or Equivalent.	Please remove.	We Request you to procure Voxel based Dosimetry software directly the OEM.	Application enabling Image based/Voxel based dosimetry & quantification software along with workstation or Equivalent

8.vii.	Broad band/ Wi-fi enabled remote diagnostic facility to be provided and maintained.	Broad band/ Wi-fi enabled remote diagnostic facility to be provided and maintained. Broadband connection shall be provided by the consignee.	Remote service shall be provided by us, however broadband connection is to be provided by the consignee for the same.	Broadband/Wi Fi Connection shall be provided by the consignee.
9. ix.	Two High resolution network Laser Color printer compatible with the processing workstation (MS Windows) with 5 sets of all cartridges per printer to be provided every year during warranty and CMC period.	Two High resolution network Laser Color printer compatible with the processing workstation (MS Windows) with 5 sets of all cartridges per printer to be provided every year during warranty and CMC period.	Request you to delete the highlighted text. Since, this is a third party item, the vendor does not provide the price validity for 10 years considering the market dynamics and volatility. The price validity provided by the vendors is one year only. Hence, we would request that the department can directly purchase this for the respective vendor as and when required.	No Change
11 iv.	CMC will include the crystals, CT Tube, batteries of UPS. All the accessories supplied with the main equipment as well as electronic, electrical consumables, cables, leads etc. will also be part of the CMC.	CMC will include the crystals, CT Tube, batteries of UPS. All the accessories supplied with the main equipment as well as electronic, electrical consumables , cables, leads etc. will also be	Warranty & CAMC excludes consumables.	No Change

		part of the CMC except consumables.		
11 v.	After sale service to be available locally with availability of an onsite engineer.	After sale service to be available locally.	Local service engineer shall provide service and support of the equipment.	After sale service to be provided locally with downtime not more than 24 hrs and a minimum of 95% uptime to be maintained. Anything beyond 24hrs down-time should be justified in written to the satisfaction of the consumer.
	i. The system should be enabled with fast rotation CT scanner with full rotation multiple rows of 16 or more channels capable of 16 slices or more per rotation.	i. The system should be enabled with fast rotation CT scanner with full rotation multiple rows capable of 16 slices or more per rotation.	GE latest SPECT-CT systems are designed with 8 rows for 16 slice CT capability.	No Change
	x. Rotational time : 0.8 to 1.0 sec	x. Rotational time : ≤ 1.0 sec	Please consider changing to <1 sec, removing 0.8 sec. Best available rotation time on latest GE SPECT CT system is 0.98 sec.	No Change

	xii. scan time to complete 360 degree scan should be 0.8 sec to 1 sec	xii. scan time to complete 360 degree scan should \leq 1 sec	Please consider changing to <1 sec, removing 0.8 sec. Best available rotation time on latest GE SPECT CT system is 0.98 sec.	No Change
	7. Acquisition Workstation xiv. Gated Cardiac and Dynamic CT imaging acquisition capability shall be provided.	7. Acquisition Workstation xiv. Gated Cardiac SPECT and Dynamic imaging acquisition capability shall be provided.	Gated Cardiac SPECT is available, also Dynamic SPECT is available. While Gated CT or dynamic CT is not available in CT subsystem available with SPECT-CT.	Acquisition Workstation with Gated Cardiac SPECT and Dynamic SPECT imaging acquisition capability shall be provided.
	9.Clinical Application Software	9.Clinical Application Software	Remove Calcium scoring – Not available in GE SPECT-CT system.	Remove Calcium scoring
	xxi. Advanced diagnostic CT applications including brain, peripheral angiography and calcium scoring software.	xxi. Advanced diagnostic CT applications including brain, peripheral angiography.	This can be performed on CT of PETCT in same dept.	xxi. Advanced diagnostic CT applications including brain, peripheral angiography.
	xxix. Application enabling OLINDA based dosimetry & quantification software along with workstation or Equivalent.	xxix. Application enabling dosimetry & quantification software along with workstation or Equivalent. Provide	GE dosimetry doesn't require 3rd party OLINDA, the MIRD calculation is inbuilt within GE Q.THERA AI application available on Xeleris workstation	Application enabling Image based/Voxel based dosimetry & quantification software along with workstation or Equivalent

		OLINDA if needed for MIRD dose calculation.		
1	Please add in specifications	Quantity & type of furniture items like chairs, tables and cupboards etc.	To ascertain the scope and cost of site modification for bidding.	Vendor to visit site along with the technical expert to assess work/furniture required in SPECT/CT room, Acquisition console, Hot lab, Reporting room. Include working console, reporting console, overhead cabins in acquisition room, hot lab & reporting room. 2 Cubboards in SPECT/CT room, Hot lab & acquisition room each. Chair - 10 in Numbers, Tables 5 in number.

ITEM No. 7 SiPM based 128 Slice Digital PET/CT Scanner + Radiopharmaceuticals

Sr.No.	Tender Specification/ Clause	Representation received	Our Justification	Decision of Technical Committee
	<p>A latest complete digital technology SIPM based whole body Positron Emission Tomography System acquiring/generating 128 slice or more per rotation, designed for providing volume measurements of metabolic & physiological process using positron emitters as well as for producing accurate structural and anatomical fusion images & making attenuation maps for CT based attenuation correction. System should acquire thin slices CT images of 0.6 to 1mm.</p>	<p>A latest complete digital technology SIPM with LSO/LYSO crystal based Time of Flight (TOF) enabled whole body Positron Emission Tomography System acquiring/generating 128 slice or more per rotation, designed for providing volume measurements of metabolic & physiological process using positron emitters as well as for producing accurate structural and anatomical fusion images & making attenuation maps for CT based attenuation correction. System should acquire thin slices CT images of 0.6 to 1mm.</p>	<p>Tender is not clarifying the types of crystals. Just coupling the SiPM to any crystal will not make a system a complete Digital PET/CT. Lutetium based PET Crystal having TOF capability attached to SiPM is the best digital PET/CT. Since last more than 5 years all government and teaching institutes are using LSO/LYSO based PET/CT, and it's best available crystals with all the PET manufacturers. Therefore, requesting to specify lutetium based (LSO/LYSO) crystal coupled with SiPM.</p>	<p>No Change</p>

Annexure-2 1. General Pg-171	The PET scanner should employ non-hygroscopic high yield Crystals for detecting 511 KeV Gamma photons in coincidence imaging with crystal thickness $\geq 20\text{mm}$.	The PET scanner should employ Lutetium based (LSO/LYSO) non-hygroscopic high density crystal with high stopping power for detecting 511 KeV gamma photons in coincidence with crystal thickness $\geq 20\text{mm}$.	Tender is not clarifying the types of crystals. Therefore, requesting to specify lutetium based (LSO/LYSO) crystal with high density, fast decay and more light outputs .	No Change
2. Gantry & Detector Point-iii Pg-172				
Annexure-2 5. Performance Specifications Point-ii Pg-173	TOF or similar reconstruction based reconstruction algorithm for better lesion detectability.	Please remove " similar reconstruction ". Please add following:	ToF is generic reconstruction algorithm and there is NO other equivalent or similar reconstruction algorithms. Tender specs mentioned allows one of the bidder to quote AI based recon which is NOT approved by FDA for other than F-18 FDG scan. This again will allow to get commercial benefits to one of the company. Since last > 5 years majority of all govt. Institutes purchased time of flight based PET/CT from various suppliers.	Hardware based TOF/DLTOF

		" Hardware based TOF reconstruction algorithm for better lesion detectability."		
7.xi.	On site remote service diagnostic facility with Wi-Fi enabled broadband internet connection.	On site remote service diagnostic facility with Wi-Fi enabled broadband internet connection that shall be provided by the consignee.	Remote service shall be provided by us, however broadband connection is to be provided by the consignee for the same.	Broadband connection will be provided by Consignee
8. Peripherals / Accessories: Point i.	A 3-phase input/output UPS (APC, Tata Liebert, Emerson, Eaton) with maintenance free batteries (Exide, Amron, Base, Yuasa) for the complete system including CT with minimum 30 min. backup at full load should be provided.	A 3-phase input/output UPS (APC, Tata Liebert, Emerson, Eaton) with maintenance free batteries (Exide, Amron, Base, Yuasa) for the complete system including CT with minimum 30 min. backup at full load should be provided.	Request you to kindly remove the Make of the UPS and batteries to enable broader participations from the vendors.	No Change
8. Peripherals / Accessories:	Rates for 300 sets of 200 ml disposable CT syringes with tubing and connector, per year during the warranty and CMC period should also be quoted.	Request you to kindly delete this.	This is provided by third-party vendors and no vendor provides the price validity for 10 years considering the market dynamics and volatility. The price validity provided by the vendors is one	No Change

Point iii.			year only. Hence, we would request that the department can directly purchase this for the respective vendor as and when required.	
8. Peripherals / Accessories:	High resolution color laser printer (600x600 dpi) for color hardcopy on paper of sizes A3, A4, etc. with 5 sets of all cartridges per year during warranty and CMC period per PET/CT machine.	High resolution color laser printer (600x600 dpi) for color hardcopy on paper of sizes A3, A4, etc. with 5 sets of all cartridges per year during warranty and CMC period per PET/CT machine.	Request you to delete the highlighted text. Since, this is a third party item, the vendor does not provide the price validity for 10 years considering the market dynamics and volatility. The price validity provided by the vendors is one year only. Hence, we would request that the department can directly purchase this for the respective vendor as and when required.	No Change
8.Peripherals / Accessories:	10 packets of dry laser films should also be provided per year during warranty and CMC period per PET/CT machine.	10 packets of dry laser films should also be provided per year during warranty and CMC period per PET/CT machine.	As this is a third-party item, request the department to purchase this directly from the vendor since, vendors do not provide the price validity of more than 1 year.	No Change

8. xiv. F-18 Labeled Radiopharmaceutical	300 doses of F-18 FDG per year/ PET-CT machine, calibrated to 200 mCi delivery at our doorstep (For initial 3 years) after commissioning of the machines. Rates to be quoted separately	Request you to kindly clarify that this should be quoted optionally so that it is not considered in L1 Ranking.	The price of the FDG supply at doorstep depends upon the consignee location. Since, the consignees are not confirmed in the tender, hence we request you to kindly make this item as optional and the price quoted for this should not be considered for evaluation and ranking purpose.	Rates to be quoted separately already mentioned in the specification.
8. xiv. F-18 Labeled Radiopharmaceutical	50 doses of other F-18 labeled Radiopharmaceuticals commercially available in market viz. F-DOPA, F-PSMA, F-MISO etc. once a week per year/ PET-CT machine, calibrated to 100 mCi delivery at our doorstep (For initial 3 years) after commissioning of the machines. Rates to be quoted separately	Request you to kindly clarify that this should be quoted optionally so that it is not considered in L1 Ranking.	The price of the FDG supply at doorstep depends upon the consignee location. Since, the consignees are not confirmed in the tender, hence we request you to kindly make this item as optional and the price quoted for this should not be considered for evaluation and ranking purpose.	Rates to be quoted separately already mentioned in the specification.
Point b.				

<p>9. Others Point vi.</p>	<p>The peripherals / accessories, electronic, electrical consumables (leads, probes, batteries etc.), phantom source and calibration sources and batteries of UPS will also form part of the warranty and CMC. Service, repair and maintenance of all third-party items will be the sole responsibility of primary vendor. Replacement / Replenishment of the coolant for gantry will also form the part of warranty as well as CMC</p>	<p>The peripherals / accessories, electronic, electrical consumables (leads, probes, batteries etc.), phantom source and calibration sources and batteries of UPS will also form part of the warranty and CMC excluding consumables. Service, repair and maintenance of all third-party items will be the sole responsibility of primary vendor. Replacement / Replenishment of the coolant for gantry will also form the part of warranty as well as CMC</p>	<p>Warranty & CAMC excludes consumables.</p>	<p>No Change</p>
<p>9. Others Point viii.</p>	<p>Onsite training by trained engineers and application specialists working in good PET centers to physicians and technologist for at least 2 weeks period.</p>	<p>Onsite training by trained engineers and application specialists working in good PET centers to physicians and technologist for at least 2 weeks period.</p>	<p>The engineers an application specialists are trained by the company and are Siemens employees, not working in PET center.</p>	<p>No Change</p>

9. Others Point ix.	After sale service to be available locally with availability of an onsite engineer.	After sale service to be available locally.	Local service engineer shall provide service and support of the equipment.	After sale service to be provided locally with downtime not more than 24 hrs and a minimum of 95% uptime to be maintained. Anything beyond 24hrs down-time should be justified in written to the satisfaction of the consumer.
	2.Gantry and detector v. Ring diameter should be \geq 75 cm	2.Gantry and detector v. Ring diameter should be \geq 70 cm	2.Gantry and detector v. Ring diameter should be \geq 70 cm	2.Gantry and detector Ring diameter should be \geq 70 cm
	vii. The geometric axial field of view (FOV) as measured from outer edges of the crystals must be \geq 20 cm.	vii. The geometric axial field of view (FOV) as measured from outer edges of the crystals must be \geq 15 cm.	Kindly consider \geq 15 cm or more axial FOV PET or \geq 26 cm. GE Digital PET can be either 16 cm or 32 cm axial FOV PET. Siemens Vision digital PET is 20 cm or 26 cm axial FOV.	No Change

	3.CT specificationi. Multi detector CT havingcapability of acquiring /generating minimum 128slices or more per rotation.	3.CT specificationi. Multi detector CT withminimum 64 rows havingcapability of acquiring /generating minimum 128slices or more per rotation.	Please specify the number of CTrows , 64 row is essential for 128slice CT imaging to complementDigital PET detection.If 64 row of CT detector is notspecified, it favours a 32 rowsystem only available withsiemens. While siemens also hasa 64 rows CT in their DigitalPETCT.	No Change
	5. Performance Specifications: ii. TOF or similar reconstruction based reconstruction algorithm for better lesion detectability.	5. Performance Specifications: ii. TOF /" Deep Learning" TOF based reconstruction algorithm for better lesion detectability.	Please include TOF/Deep Learning TOF , we have latest developed Deep Learning TOF available in addition to Q.CLEAR Technology	5. Performance Specifications: ii. TOF /" Deep Learning" TOF based reconstruction algorithm for better lesion detectability.
	iv. System sensitivity must be ≥ 5.0 cps/KBq at center.	iv. System NEMA sensitivity must be ≥ 11.0 cps/KBq at center.	Digital PET system offer much higher NEMA sensitivity. Cutoff of >5.5 cps/KBq is very low, typical of siemens analog PETCT. GE system offer 11.8 cps/KBq on 16 cm Digital PETCT and 46 cps/KBq on 32 cm PETCT. Siemens has 8.9 cps/KBq on 20 cm and 16 cps/KBq on 26 cm axial FOV PET.	No Change

	<p>xii. Fully 3-D speedy iterative reconstruction with scatter correction, OSEM technique, High Definition (HD) and Time-of-Flight reconstruction algorithms must be standard features.</p>	<p>xii. Fully 3-D speedy iterative reconstruction with scatter correction, OSEM technique, High Definition (HD) and Time-of-Flight/”Deep Learning” TOF reconstruction algorithms must be standard features.</p>	<p>Please include TOF/Deep Learning TOF , we have latest developed Deep Learning TOF available in addition to Q.CLEAR Technology.</p>	<p>xii. Fully 3-D speedy iterative reconstruction with scatter correction, OSEM technique, High Definition (HD) and Time-of-Flight/”Deep Learning” TOF reconstruction algorithms must be standard features.</p>
	<p>xiv Advanced 3-D volumerendering with 3-D fusion,Model based/Image based 3-D scatter correction, virtualendoscopy, andbronchoscopy.xvii. Scatter Correction:Scatter correction must beprovided based on scan ofthe actual patient whosescan is being corrected andprocessed automatically.</p>	<p>xiv Advanced 3-D volumerendering with 3-D fusion,Model based/Image based 3-D scatter correction, virtualendoscopy, andbronchoscopy.xvii. Scatter Correction:Scatter correction must beeither “model based” / orprovided based on scan ofthe actual patient whose scanis being corrected andprocessed automatically</p>	<p>Scatter correction is mentioned is2 instances and scatter algorithm varies per manufacturer. We offerMode based scatter correction.Requesting uniform broadspecifications to qualify allmanufacturer.</p>	<p>xiv Advanced 3-D volume rendering with 3-D fusion,Model based/Image based 3-D scatter correction, virtual endoscopy, and bronchoscopy.xvii. Scatter Correction: Scatter correction must beeither “model based” / or Image based on scan ofthe actual patient whose scan is being corrected andprocessed automatically</p>

	<p>xiv. F-18 Labeled Radiopharmaceuticals : b. 50 doses of other F-18 labeled Radiopharmaceuticals commercially available in market viz. F-DOPA, FPSMA, F-MISO etc. once a week per year / PET-CT machine , calibrated to 100 mCi at our doorstep (for initial 3 years) after commissioning of the machines. Rates to be quoted separately</p>	<p>xiv. F-18 Labeled Radiopharmaceuticals : b. 50 doses of other F-18 labeled Radiopharmaceuticals commercially available in market viz. F-DOPA, FPSMA - each x once a week per year / PET-CT machine , calibrated to 100 mCi at our doorstep (for initial 3 years) after commissioning of the machines. Rates to be quoted separately.</p>	<p>Remove F-MISO - not available routinely. Remove “etc.” as it makes it open ended requirement.</p>	<p>May be considered remove F-Miso and etc.</p>
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5	Please add in specifications	Quantity & type of furniture items like chairs, tables and cupboards etc.	To ascertain the scope and cost of site modification for bidding.	Vendor to visit site along with the technical expert to assess work/furniture required in SPECT/CT room, Acquisition console, Hot lab, Reporting room. Include working console, reporting console, overhead cabins in acquisition room, hot lab & reporting room. 2 Cubboards in SPECT/CT room, Hot lab & acquisition room each. Chair - 10 in Numbers, Tables 5 in number. Godrej or equivalent.
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TERMS & CONDITIONS FOR TURNKEY WORKS:

The Tenderer shall examine the existing site where the equipment is to be installed to assess the site condition for Equipment placement and installation. Whether the scope of Turnkey Works is mentioned in the Technical Specifications or not, the bidder's offer should be on a "Turn Key" basis including all costs associated with the supply, installation and commissioning of the equipment.

For equipment, the major Turnkey work to be carried out are given at the end of Technical Specification. The Tenderer to quote prices indicating break-up of prices of the Machine and Turnkey Job of Hospital/Institution/Medical College. The Turnkey costs to be quoted in Indian Rupee will be added for Ranking Purpose. The taxes to be paid extra, to be specifically stated. Equipment to be quoted inclusive of turnkey works. In the absence of any such stipulation the price will be taken inclusive of such duties and taxes and no claim for the same will be entertained later. The Turnkey Work should completely comply with AERB requirement, if any.

Bidders must take into consideration in its bid, the costs to be incurred for any additional work pertaining to civil, Electrical, Plumbing, sanitary, Radiation protection as per Govt. regulation, furniture, servo stabilizers, U.P.S. etc. required for successful installation testing and commissioning of the Medical Equipment and the "All inclusive lump sum price" should include all such costs, each **schedule/package** is to be considered a package in itself and suppliers to execute the order package on a "turn key basis" including all civil, electrical, air – conditioning & allied requirement for the equipment, at the site.

For X-Ray and related equipment, bidders who have Type Approval/NOC of AERB/BARC shall only be considered with documentary evidence. It shall be bidder's responsibility to get the equipment installed and commissioned as per AERB / BARC guidelines and installed and commission on "Turn Key basis".

Bidders must take into consideration in its bid the costs to be incurred for any additional work viz. Electrical cabling, plugs of suitable ratings from the source, Electrical points of suitable ratings, water connection, water drainage, plumbing, air-conditioning, Radiation protection/shielding, mechanical & allied requirement for the equipment etc. required for successful installation, commissioning and running of the Equipment and the quoted "All inclusive lump sum price" should include all such costs.

Following details of Various Makes for Executing Turnkey Activities for Installation, Testing & Commissioning of Medical Equipment.

LIST OF APPROVED MAKES : CIVIL WORKS

S.No	Material	MANUFACTURERS
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1	Doors & Windows fixtures/ Fittings	<i>Dorma, Godrej, Ozone, Austavision</i>
2	Door Closer / Floor spring	<i>Ozone, hettich, Dorma, Godrej,</i>
3	Aluminium Sections.	Hindalco, Jindal, <i>BALCO, Alom</i>
4	Clear Glass/ Clear Float Glass/ Toughened Glass	Saint Gobain(SG), Modi, <i>Asahi, Glaverbel</i>
5	Laminates	Formica, Decolam, Century, Marino, <i>Greenlam</i>
6	Synthetic Enamel Paints	Berger, Asian, ICI , Nerolac, Shalimar
7	Oil Bound Distemper	Berger, Asian, <i>ICI</i> , Nerolac, Shalimar
8	Cement Paint	Snowcem plus, Berger, Nerolac, <i>Asian, ICI</i>
9	Plastic Emulsion Paint	<i>Berger</i> , Asian, ICI , Nerolac, Shalimar
10	Other Paints/Primers	Berger, Asian, ICI , Nerolac, Shalimar
11	MS Pipe/ Sections	Jindal Hisar, Prakash-Surya, BST, Kalinga, Tata
12	Polycarbonate Sheets	<i>GE, Macrolux, Plastic, Vergola, Skyarch, Polytechno</i>
14	Wooden Fire Check Doors	Navair, Pacific Fire Control, Kutty Promat, Sukri
15	Metal Fire Check Doors	Navair, Shakti- Met, Godrej, Sukri, Pacific Fire Control
16	Ceramic Tiles	Johnson, Somany, Kajaria, Nitco, <i>Bell, Hindustan,</i>
17	Pre-Laminated Particle Board	Novopan, Greenlam, Kitlam, Marino, <i>Century, Archid ply</i>
18	Flush Door Shutters	Century, Kitply, Green Ply, <i>Duro</i>
19	Glazed Tiles	Bell, Somany, Johnson, Kajaria, <i>Nitco</i>
20	PVC Water Stops	<i>Prince/Supreme/Finolex//BASF</i>
21	White Cement	Birla White, J.K., <i>Grasim</i>
22	Dash Fasteners./Anchor bolts	Hilti, Fischer, Bosch,

23	Stainless Steel Bolts, Washers and nuts	Kundan , Puja , Atul
24	6mm thick Reflective Glass	Glaverbel, Glavermas, Saint Gobain, <i>Asahi</i>
25	Door Locks	ACME, Godrej, <i>Dorma</i>
26	Door Seal – Woolpile Weather Strip/ <i>Acoustic seal</i>	Anand -Reddiplex, <i>Enviroseal, Viper</i>
27	Aluminium Grill	Hindalco, Jindal
28	Vitrified Tiles	Naveen, Bell, Kajaria, Somani, <i>Nitco, Johnson, Euro</i>
29	Aluminium Cladding sheets	Alstrong , Alpolic, Alucobond, Alstone International, Aludecor Lamination
30	Stainless steel D-handles	D-line, Giesse, Dorma, Dorset, ozone
31	Stainless Steel Pipes/Flats	304 Grade (as approved by Engineer)
32	Structural Steel	TATA, SAIL, RINL, JINDAL
33	Epoxy Flooring/ wall coating	Fosrock, Beck, Famaflor, <i>Araldite, STP, Sika, BASF</i>
34	Ply board	Greenply, Kitply, Century, Archid, Marino, <i>Duro</i>
35	PVC Flooring	LG, Tarkett, Responsive , <i>Armstrong, Gerflor</i>
36	SS Railing	<i>Ozone, D-Line, Jindal,</i>
37	Fire rated door closer/Mortice Lock/ Door Co-ordinator	Dorma, Becker F.S. Australian or approved equivalent
38	Gypsum Board System	Gyproc (Saint Gobain), Lafarge, Boral, <i>Hilux,, Aerolite</i>
39	Adhesive for Door Work	<i>Fevicol/ Vamicol/ Dunlop/ Piditite/ Sika/ Thermoshield</i>
40	Epoxy Paint	<i>Nerolac/ Shalimar/ cico/ Fairmate/ sika/ BASF/ Berger/ Asian/ Pidilite</i>
41	Polysulphide sealant	Pidilite/ Fosroc/ Choksey/chematal rai/ cico/ sika, MC Bouchemie, BASF, STP
42	Glass Doors (Motorised)	<i>DORMA/ Hafle/ Ozone</i>
43	Calcium silicate boards	<i>Hilux/ Aerolite, Armstrong</i>
44	Calcium Silicate Tiles	<i>Hilux/ Aerolite, Armstrong</i>

45	Texture Paints	<i>Spectrum/Heritages/ICI Dulux/Asian</i>
46	Wall care putti	<i>J.K. White/Birla/Gyproc wall putty</i>
47	Frameless glass partition fixtures	<i>Dorma/Hafle/Ozone</i>
48	U-PVC Windows	<i>Fenesta, Window Magic, Aluplast</i>
49	Toilet Cubicles	<i>Greenlam, Marino or approved equivalent</i>
Note:	<p>If the makes given in the list are not available, other equivalent makes can be considered subject to approval by the Purchaser/HSCC based on credentials of the company and test certificates of the product, subject to price adjustment.</p> <p>Wherever makes have not been specified for certain items, the same shall be as per BIS and as per approval of Purchaser/HSCC.</p>	

LIST OF APPROVED MAKES: PLUMBING WORKS

Sl.No	Material	Relevant IS Code	MANUFACTURERS
1	Vitreous China Sanitary ware	2556	Kohler, Roca, American Standard, Toto
2	White Glazed Fire Clay Sink	771	Sanfire, Cera, Neycer, Hindware.
3	Stainless Steel Sink		Jayna, <i>Neelkanth</i> , Commander, Nirali
4	Plastic seat cover of W.C	2548	Kohler, Roca, American Standard, Toto
5	Geysers		Racold, Venus, Voltas, Usha Lexus, Jaguar, Havells
6	C.P. Fittings Mixer/Pillar taps Washers, C.P. brass accessories ,CP Angle Valve,Bibcocks,CP waste	1795/4291/4827	Kohler, Roca, American Standard, Toto
7	Centrifugally /Sand cast iron pipes & fittings	3989/1729	Neco, Hepco, <i>SKF</i>
8	G.I. Pipes	1239 Part I	Jindal-Hissar, Tata, Prakash-Surya

9	G.I. Fittings	1239 Part I	Unik, K.S., Zoloto, R
10	Stoneware pipes & Gully Traps	651	IS Marked pipes
11	Mirror		Atul, Modi guard, <i>Asahi, Saint Gobain</i>
12	Hand drier		Kopal, Automat, Euronics, <i>Utech</i>
14	Insulation of Hot water pipes		Vidoflex insulation, Superlon, <i>Thermaflex, Kaiflexkaimenn</i>
15	D.I pipes		Jindal, Tata, Electrosteel., <i>Kesoram</i>
16	PVC/UPVC pipes & fittings		FINolex , Prince,
17	Infrared Sensor operated Faucets/Urinals		Kohler, Roca, American Standard, Toto
18	Gratings, Strainers, Cleanouts etc		Neer Brand (Sage Metals), <i>ACO</i>
19	Decorative bath room fittings		Jaquar (Florentine range), Aquabaths, Kohler
20	HDPE pipes and fittings		Oriplast, So-Soon, Finolex, Gebreti, Nosil,
21	CPVC pipe, fittings and Solvent		Flowguard, Astral, Prince,
22	Copper Pipe		Raj Co., Maxflow, <i>Mehta Tubes</i>
23	Copper Fittings		Viega, IBP, <i>Yorkshire, Mehta Tubes, Rajco</i>
24	Lab drainage		Viega, Duraline, Rex
25	Lab Fittings		Vijay, Viega
26	SS pipe(EN-10312) & press type fitting		Viega, Jindal
27	Oxilyte (Mixed oxident)		Oxybee Solutions, I2M Technologies, Faith Innovations

Note: Wherever makes have not been specified for certain items, the same shall be as per BIS and as per approval of Purchaser/HSCC.

LIST OF APPROVED MAKES : FIRE FIGHTING WORKS

Sl.No	Material	Relevant ISI Code	MANUFACTURERS
1	G.I./M.S. Heavy class pipe	1239/3589	Jindal-Hissar, Tata, Prakash -Surya,

2	Portable Fire Extinguisher	2171	Minimax, Safex, Ceasefire, Newage,
3	Sprinkler Heads		
4	Pendent type		Tyco, Viking, HD, Grinnel
5	Side wall type		Tyco, Viking, HD, Grinnel
6	Sprinkler Side wall extended through		Tyco, Viking, HD, Grinnel
7	Standby battery lead acid		Exide, Standard, Amco
8	Cables		As per Electrical Works
9	G.I. Fittings	1239 Part I	Unik, K.S., Zoloto, R
10	DI pipes		Jindal, TATA, Electrosteel, Kesoram
11	Pipe coat material (Pipe protection)		<i>Pypkote Integrated water proofing co. Madras/ coaltek Rustech products (P) Ltd. Syndcate Enclave, Dabri/Makphall</i>
12	Fire Man's Axe		<i>Safeguard/safex/Newage/Gunnebo</i>

Note: Wherever makes have not been specified for certain items, the same shall be as per BIS and as per approval of Purchaser/HSCC.

LIST OF APPROVED MAKES FOR ELECTRICAL SYSTEM

Contractor shall use the materials of approved make as indicated below unless specified in BOQ or as approved by the HSCC electrical incharge. The contractor shall ensure the correct selection of the approved make meeting the specifications and application duties. Before placing order for procurement, the sample of approved make shall be got verified for its suitability to the specification and application duty. However, HSCC electrical engineer (approving authority) reserves the right to opt for the best preferred listed make. The contractor shall quote the rate for the material and equipment as per the list of approved makes and equipment as per the list of approved makes. In the event of the contractor wants to use alternate makes other than those stipulated for any reason, the contractor can send a proposal after ensuring that what he proposes at the least meets both the quality and safety standard of the stipulated makes, and the financial benefit that will accrue to the client. He shall also stand full guarantee to his alternate proposal. The alternate makes can be used only after an approval accorded by the client/HSCC., whose decision will be final in this matter. Any financial implication incurred related with inspection will be borne by contractor.

S.No.	Item Description	Make list
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1	Timers in Distribution board	Legrand/ Hagar/ Siemens/ ABB/ GE
2	MCB distribution Boards	L &T /Hager/ MDS/Legrand/ Siemens, ABB/GE/ Schenieder (MG)
3	MCB	L &T /Hager/ MDS/Legrand/ Siemens, ABB/GE/ Schenieder (MG)
4	Rewirable porcelain wire	CPL, KEW
5	Data and Voice wire	Finolex,Delton,Skyton,Anchor,L&T,AT&T, Avaya
6	RCCB	L & T Hager/ Legrand/ Siemens , GE/Schenider (Merlin –Gerin)
7	ELCB/ELMCB	Merlin Gerin-multi 9, Legrand, Hager, Siemens
8	11 KV LT XLPE cables	RPG/ Polycab/ NICCO/ UNIVERSAL/Rallison/KEI/Skytone/ Havells
9	Copper Control cable	Finolex/ Polycab/ NICCO/ Universal/ National/ Rallision/RR Cable
10	Cable Joints (Heat Shrinkable)	Raychem/3M/Cabseal
11	Cable Trays	Steelways/ Bharti/ Unitech /Maheshwari/or approved by HSCC
12	Galvanized/PVC Raceways and raceways accessories	Steelways/ Bharti/ Schneider(MG)/Legrand
13	Light fitting	Philips/ GE/ Crompton Greaves

14	fancy LIGHT FITTING	Anchor(Panasonic)/ Twinkle/Decon/Ankur
15	Lamps	Philips/ Osram/ GE/Anchor (Panasonic)/Perlite
16	GI / MS conduit ISI marked	BEC/ AKG/ Steel Kraft
17	PVC conduit	BEC/ AKG
18	Steel conduit accessories (ISI as approved sample)	Sharma sales corporation, super sales corporation or equivalent.
19	Modular Metal box for switch /socket	Havells/ MK/MDS/Anchor Roma/Northwest
20	Copper conductor FRLS PVC insulated wires ISI marked	National/ Finolex / R R cable/Rallison/Skytone/lap/Bonton
21	Modular Switches & sockets Outlets	Havell's (Crabtree)/ MK- Wraparound/Hagger/Wipro Legrand (Myrius/ Anchor- Roma(Tersa,woods,viola)/ Northwest
22	Metal clad Socket outlets With boxes	L & T Hager/ Siemens/ Merlin Gerin/ ABB MDS / BCH /Havells
23	UPS system	PCI LTD/ Siemens/ Etone powerware/Emerson/APC (Schneider)
24	Electronic Ballast	Philips/ Wipro/Osram / Bajaj

25	Ceiling fans	Crompton Greaves/ Bajaj/ Orient/ Alastom/ Usha
26	Main PC with CPU monitor	HP/ Compaq/Del
27	PVC Tape	Steel Grip
28	Batton Holder,Angle holder, Ceiling Rose	Anchor
29	Exhaust Fan with Gravity Louvers	Usha Lexus/Orient/ Crompton/Industriel- Almonard/ GEC
30	TV Cable- Co axial	Finolex, airtech, bhansali
31	Chemical Earthing	Ashlok, Erico, Pioneer, Nimbus,JK Earthing
32	LCD/LED Monitor	Sony, Panasonic, Samsung

LIST OF APPROVED MAKES AND MANUFACTURERS

The subcontractors/makes/brands of equipment listed below are approved for installation.

All items to be used in the works samples, catalogues and specifications are to be submitted by the contractor for approval of the Purchaser/HSCC. Only approved makes shall be used in the works. The approved samples shall be kept in the custody of the Purchaser/HSCC for comparison.

S.No	Material/Item	Approved Makes
1	Precision AC units	Emerson/Blue box/Stulz/Hiross
2	Window/split AC	Carrier /Hitachi/Voltas/Bluestar/Daikin/Ogeneral
3	VRV/VRF	Carrier /Hitachi/Daikin/Ogeneral
	Ducting & Grilles	
4	Factory fabricated duct	Zeco/ Ductofab/Rolastar/Technofab
5	G.I. Sheet Metal Duct	Jindal /National/ Tata/Sail
6	Spiral duct	Atco/Seven Star
7	Grilles/Diffusers/Volume Controller	Ravistar/Caryaire/ Mapro/Dynacraft/Airmaster
8	Fire Dampers UL listed	Caryaire/Dynacraft / Ravistar/Ruskin
9	Sound Attenuator	Caryaire/Dynacraft/Ravistar/Trox
10	G.I. Sheets	TATA/SAIL/Jindal/Bhushan Steel
11	Aluminium Sheets	Balco/Nalco/Hindalco
12	Stick Pins	Prima Seal/Air flow
	Pipes	
13	G.I.	ITC/ Jindal Hissar/Tata/SAIL/HSL
14	M.S. upto 150 mm	ITC/ Jindal Hissar/Tata/SAIL/HSL
15	M.S. 200 mm and above dia factory rolled	ITC/ Jindal Hissar/Tata/SAIL/HSL
	Valves	
16	Butterfly Valves	Advance/Audco

17	Motorised butterfly valve(actuator)	Belimo/Honeywell/Invensys/siemens
18	Non Return Valve	Advance/Kirloskar/Audco
19	Balancing Valves	Advance/Audco/Danfoss/Honeywell
20	Gate/Globe Valves	Leader/Divine/Sant/Bankim Sarkar /Zoloto
21	GM valve upto 40mm	Leader/Divine/Sant/Bankim Sarkar /Zoloto
22	Ball Valve with Y strainer	Rapid Control/Sant/Leader/Zoloto
23	Pressure independent Balancing valve	Danfoss/Flowcon/TA
	Accessories	
24	Y-strainer	Emerald/Sant/Rapid cool
25	Pressure Gauge	Fiebig/Emerald/H Guru/Japsin
26	Thermometer	Fiebig/Emerald/H Guru/Japsin
27	Flow Switch	Rapid Control/Anergy
28	Automatic Air Vent	Rapid Control/Anergy
29	Suction Guide	Anergy/ Rapid Control/Flowcon
30	Filters(pre,fine Hepa)	Thermadyne/Spectrum/Kirloskar /Anfilco/Johnflower/Dynafilter
	Insulation	
31	Expanded Polystyrene	Beardsell Ltd./ BASF/Styrene Packing/ Indian Packaging Industries/ Lloyd
32	Glass Wool	FGP Ltd./UP Twiga/Kimmco / Owens Corning
33	Polyurethane Foam	Malanpur /Superurethane
34	Crossed linked Polyethylene Foam	Trocellene / Aeroflex/Armacell/
35	Closed Cell Elastomeric Insulation	K-flex /Vedoflex/Armacell
36	Non woven fibre material	Mikron/ Du pont
37	Mineral wool	Rockwool India Pvt Ltd,
38	Pre-moulded PUF section for pipe & pipe supports	Malanpur/ Lloyd
39	Fibreglass rigid Board/Pipe section	FGP Ltd./UP Twiga/Kimmco / Owens Corning
40	Aluminium Tape	Johnson/Birla 3M/Garware

41	Thermostats	Honeywell/Johnson controls/Belimo/Danfoss/Siemens/Oventrop
42	Humidistat	Honeywell/Johnson control/ Belimo/Danfoss
	Miscellaneous	
43	V Belt	Dunlop/Fenner
44	Anchor fastners	Fischer/Hilti
45	Dash fastner	Fischer/Hilti
46	Welding rods	Advani/L&T
47	Wire Rope duct supporting arrangement	Gripple
48	Flexible pipe connection	Dunlop/Kanwal/resistoflex
49	Hessian Cloth (fire rated)	Navair/Pyrogaurd
50	Vibration isolator	Resistoflex, Dunlup, Kanwal
51	Copper Refrigerant Piping	Diamond/Star/Rajco

It is the vendors/suppliers responsibility to do the needful for installation, testing and commissioning of Medical Equipment as per terms and conditions of the Bid Document including Turnkey Works mentioned in the Bid Document.

Sr. No	Tender reference	AMENDED AS
<p>Item No. 1 CT Simulator Item No. 2 High Dose Rate Brachytherapy Machine Item No. 3 Advance High Energy Linear Accelerator Item No. 4 Low Energy Linear Item No. 6 16 Slice Dual Head SPECT/CT Scanner Item No. 7 sSiPM based 128 Slice Digital PET/CT Scanner + Radiopharmaceuticals</p>	<p>Part II: Required Delivery Schedule:</p> <p>32.8.1 1 For Indigenous goods or for imported goods if supplied from India: 60 days from date of Notification of Award to delivery at consignee site. The date of delivery will be the date of delivery at consignee site. Tenderers may quote earliest delivery period. Installation and commissioning shall be done within 45 days of receipt of the stores/ goods at site or within 45 days of handing over the site for installation, whichever is later.</p> <p>32.8.2 For Imported goods directly from foreign: 60 days from the date of opening of L/C. The date of delivery will be the date when the consignment reaches the port of destination. (Tenderers may quote the earliest delivery period). Delivery of indigenous goods contracted along with the direct imported items shall be within the scheduled delivery period for imported goods. Installation and commissioning shall be done within 45 days of receipt of the stores/ goods at site or within 45 days of handing over the site for installation, whichever is later For delayed delivery and/ or installation and commissioning liquidated damages will get applied as per GCC clause 23.</p>	<p>Part II: Required Delivery Schedule:</p> <p>32.8.1 1 For Indigenous goods or for imported goods if supplied from India: 120 days from date of Notification of Award to delivery at consignee site. The date of delivery will be the date of delivery at consignee site. Tenderers may quote earliest delivery period. Installation and commissioning shall be done within 60 days of receipt of the stores/ goods at site or within 60 days of handing over the site for installation, whichever is later.</p> <p>OR</p> <p>Supply, installation & commissioning to be completed within 180 days from the date of Notification of award (NOA).</p> <p>32.8.2 For Imported goods directly from foreign: 120 days from the date of opening of L/C. The date of delivery will be the date when the consignment reaches the port of destination. (Tenderers may quote the earliest delivery period). Delivery of indigenous goods contracted along with the direct imported items shall be within the scheduled delivery period for imported goods. Installation and commissioning shall be done within 60 days of receipt of the stores/ goods at site or within 60 days of handing over the site for installation, whichever is later For delayed delivery and/ or installation and commissioning liquidated damages will get applied as per GCC clause 23.</p> <p>OR</p>

		Supply, installation & commissioning to be completed within 180 days from the date of Opening of LC.
Warranty	Item No. 1 CT Simulator Item No. 2 High Dose Rate Brachytherapy Machine Item No. 3 Advance High Energy Linear Accelerator Item No. 4 Low Energy Linear Item No. 6 16 Slice Dual Head SPECT/CT Scanner Item No. 7 sSiPM based 128 Slice Digital PET/CT Scanner + Radiopharmaceuticals Item No. 8 FibroScan	5 Years Warranty and 5 years CMC

All other terms & conditions remain unchanged.

Prospective bidders are advised to regularly visit through HSCC e-tender portal <https://hssc.enivida.com>, HSCC website <http://www.hsccltd.co.in> & CPP Portal <https://eprocure.gov.in/epublish/app> as corrigendum/amendments etc., if any, will be notified on this portal only and not be published anywhere else.

(– sd –)
 GM (proc.)
 HSCC (India) Ltd.