

Notice Inviting e-Tender

West Bengal Medical Services Corporation Limited

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**SUPPLY AND COMMISSIONING OF LINEAR ACCELERATOR MACHINE IN THE
MEDICAL COLLEGES OF THE GOVERNMENT OF WEST BENGAL.**

(Submission of Bid through *online*)

Bid Reference No.: WBMSCL/NIT-45 /2016

Dated- 05.08.2016

Amendment 3

Read Clause 7 (marked in red below) at Page No. 5 under Section I:
Instruction to Tenderers

7. Service Up time in Warranty & CMC

Working condition for a minimum period of 354 days out of a period of 365 days.
(i.e. 97% uptime)

The response time to any fault should be not more than 2 hrs. Time for rectification
should not be more than 12 hours

Maximum Downtime allowed without penalty : 24 hours

Penalty per LINAC beyond 12 hours of non physical attendance: Rs. 50,000 per 24
hours or part thereof.

Penalty per LINAC for Downtime after 24 hrs is Rs. 60000/- per 24 hours cycle or part
thereof.

Penalty shall be paid to Medical College authority.

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7. Service Up time in Warranty & CMC

97% up time Warranty of complete equipment and the entire set up on 24 (hrs) X 7 (days) X 365
(days) basis.

The response time to any fault should be not more than 2 hrs. Time for rectification
should not be more than 12 hours

Maximum Downtime allowed without penalty : 24 hours

Penalty per LINAC beyond 12 hours of non physical attendance: Rs. 50,000 per 24
hours or part thereof.

Penalty per LINAC for Downtime after 24 hrs is Rs. 60000/- per 24 hours cycle or part
thereof.

Penalty shall be paid to Medical College authority.

Amendment 4

Read Clause 4(a) (marked in red below) at Page No. 4 under Section I:
Instruction to Tenderers

4. (a) Time for Supplies & commissioning

Description	Time
Time for Completion supply, installation and commissioning including turnkey job (site preparation and interior works) from the date of issuance of Award of Work	150 Days

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4. (a) Time for Supplies & commissioning

Description	Time
Time for Completion of supply and installation of ordered good(s) including Turnkey job (site preparation and interior works) after opening of LC	150 Days
The commissioning of ordered good(s) shall be carried out by the supplier by providing adequate number of commissioning experts at each site alongwith the help of the users from the date of completion of installation.	60 Days

Amendment 5

Read Clause 8 (marked in red below) at Page No. 5 under Section I:
Instruction to Tenderers

8. Liquidated damages for Delayed Delivery/Delayed setting up of Services

The percentage of 0.5% of the Invoice price for each week or part thereof, of delay until actual delivery or performance, up to a maximum deduction of 5% of the Invoice price.

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8. Liquidated damages for Delayed Delivery and Installation

If the supplier fails to deliver and install any or all of the goods or fails to perform the services within the time frame(s) incorporated in the contract, the Purchaser/Consignee shall, without prejudice to other rights and remedies available to the Purchaser/Consignee under the contract, deduct from the contract price, as liquidated damages, a sum equivalent to 0.5% per week of delay or part thereof on delayed supply and installation of goods and/or services until actual delivery or performance subject to a maximum of 10% of the contract price. Once the maximum is reached Purchaser/Consignee may consider termination of the contract.

Amendment 6

Under FURNITURE REQUIREMENT for both the LINAC under the Scope of Work for Turnkey -at Page No. 97.

The following items have been added in the **FURNITURE REQUIREMENT** of the 3 Medical Colleges:

1	Desktop Computer with latest configuration for e-LORA and other official work along with A4 scanner, LASER Printer and UPS	1 unit	Physicist room
2	LED TV 48" (16hrsX7days)	1 unit	Patient working area
3	Cartridge (black and colour) for Printers associated with TPS and Control Computer of LINAC	10 nos. for each Printer over a period of 5 years as and when required by the end user.	TPS room and Control Console of LINAC
4	Trolley with facility for oxygen cylinder attachment	2	Patient Transportation
5	Wheel Chair	2	Patient Transportation
6	Vacuum Cleaner	1	For cleaning
7	Shoe Shelf (25 pairs)	2	Outside waiting area
8	Door Mat	10	Outside waiting area & outside LINAC room

Amendment 7

Under FURNITURE REQUIREMENT for both the LINAC: The Scope of Work for Turnkey -at Sl. No. 05 for Medical College & Hospital, Kolkata; at Sl. No. 04 for RG Kar Medical College & Hospital, Kolkata and at Sl. No. 04 for NRS Medical College & Hospital, Kolkata at Page No. 97 & Page No. 98 respectively;

Specifications for the 2(two) View Boxes to be supplied to Medical Colleges with the furniture list:

LED X-Ray film viewer with adjustable brightness, capable of holding 3 films (14" x 17")

Amendment 8

The following Point has been added in the Technical Specifications of both the High End High Energy & High Energy LINAC

The model or version of both the LINAC machines must be on Digital Platform and launched on or after Year 2010

Amendment 9

Read (the following marked in red under **specifications of TPS** at Page No. 80)

The vendor should include non-coplanar imaging with the help of LINAC independent room based KV imaging with 2 floor mounted X-rays and 2 ceiling mounted detectors for all frameless SRS and SBRT treatment which involves non-coplanar delivery of treatment with 6D corrections or equivalent.

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The vendor should include non-coplanar imaging with the help of LINAC independent room based KV imaging with 2 floor mounted X-rays and 2 ceiling mounted detectors for all frameless SRS and SBRT treatment which involves non-coplanar delivery of treatment with 6D corrections

OR

Equivalent technology having advanced image guidance package with Triggered imaging. Triggering should be based on MU, time or gantry angle along with the fluoro imaging. It should have imaging capability during treatment itself.

Amendment 10

Read the following (marked in red) under specifications for Treatment Planning System (TPS) at Page No. 80

Optical Surface Monitoring System for frameless SRS

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Optical Surface Monitoring System for frameless SRS - Optional

Amendment 11

Read (marked in red below) at Page No. 74 in the specification of High Energy LINAC

MULTI-LEAF COLLIMATOR:

The MLC system shall have at least 80 leaves (40 pairs MLC) **and must be exactly same as the other LINAC to provide seamless Beam Matching facility**, with following features:

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MULTI-LEAF COLLIMATOR:

The MLC system shall have at least 120 leaves (60 pairs MLC) **and must be exactly same as the other LINAC to provide seamless Beam Matching facility**, with following features:

Amendment 12

Read (marked in red below) for High Energy Linear Accelerator at Page No. 80

Integrated single MLC with 2.5 mm (SRS) along with 5 mm resolution also.

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Cones to be provided for SRS / SRT.

Or

Integrated single MLC with 2.5 mm for SRS/SRT along with 5 mm resolution.

Amendment 13

Read (marked in red below) at Point No. 7 at Page No. 47 for High End High Energy LINAC

- 7. Electron Arc Therapy:** Electron Arc therapy with necessary applicators shall be provided. The clockwise and anticlockwise gantry rotation must be possible for arc therapy. The MU/Deg must automatically be computed for a defined arc and calculated total MUs.

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- 7. Electron Arc Therapy:** Electron Arc therapy with necessary applicators shall be provided, if available. The clockwise and anticlockwise gantry rotation must be possible for arc therapy. The MU/Deg must automatically be computed for a defined arc and calculated total MUs. – must be provided, if available with the system

Amendment 14

The following has been added in the general terms of the tender,

Life span of LINAC machines should be minimum of 10 years. The bidders should provide all necessary spare parts & services for satisfactory functioning of the equipments for the period.

Amendment 15

Read (marked in red below) at Page No. 6

Note 4: Service Centres

- Should have service centre in Kolkata with all necessary spare parts.

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Note 4: Service Centres

- Should have Kolkata based adequate service Engineers with all necessary spare parts.

Amendment 16

Read Clause 9 (marked in red) at Page No. 5 under **Section I: Instructors** to the tenderers.

9. Experience and Technical Capacity (E)

The manufacturer whose product is offered by the Tenderer must have commissioned **at least 3 (three)** LINEAR ACCELERATOR MACHINE which are functioning satisfactorily as on the date (s) of physical inspection.

The offered equipment must be from manufacturing unit having the ISO quality certification. The certificate must be valid and established by an internationally recognized inspection company.

Tenderers shall invariably furnish documentary evidence / Client's certificate of at least 3 (three) users of the quoted model in support of the satisfactory operation. At least 1 (one) client / user of the quoted model should be in India.

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9. Experience and Technical Capacity (E)

The manufacturer whose product is offered by the Tenderer must have commissioned **at least 3 (three)** LINEAR ACCELERATOR MACHINE which are functioning satisfactorily as on the date (s) of physical inspection.

The offered equipment must be from manufacturing unit having the ISO quality certification. The certificate must be valid and established by an internationally recognized inspection company.

Tenderers shall invariably furnish documentary evidence / Client's certificate of at least 2 (two) users for each of the quoted models and total of minimum 5(five) certificates for the 2(two) models in support of their satisfactory operation. At least 1 (one) client / user for each of the quoted models should be in India.

Amendment 17

Read the content at Sl. No. 17 (marked in red) in **Form 2: Check-list** at Page No. 106

Satisfactory Performance Certificate from at least 3 (three) users of the quoted model in support of the satisfactory operation in India.

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Documentary evidence / Client's certificate of at least 2 (two) users for each of the quoted models and total of minimum 5 certificates for 2 models in support of their satisfactory operation. At least 1 (one) client / user for each of the quoted model should be in India.

Amendment 18

Read the following (marked in red) in the specifications of High Energy LINAC at Page No. 61

The Medical Linear Accelerator with Multi-leaf collimator capable of producing dual energy photons of 6 MV & 15 MV with electron beams of minimum 5 electron energies between 4-18 MeV and above. The Medical Linear Accelerator should be capable of delivering:

AS

The Medical Linear Accelerator with Multi-leaf collimator capable of producing dual energy photons of 6 MV & 15 MV with electron beams of minimum 4 electron energies between **4-18 MeV and above**. The Medical Linear Accelerator should be capable of delivering:

Amendment 19

The following has been added under **Warranty & CMC:**

No conditional warranty like mishandling, manufacturing defects etc. will be acceptable.

Amendment 20

Read the following (marked in red) in the specification for both the LINACs at Page No. 69

The chiller system must be imported one

AS

The chiller system must be imported/export quality with backup compressor.

Amendment 21

Read the following (marked in red) in the **Quality Evaluation** under **Evaluation and Comparison of Bids** at Page No. 18, 19 & 20

High-End High-energy LINAC						
Sl. No.	Feature / Speciality	Explanation	Unit of Measurement	Full Marks	Quality Parameter	
					Feature / Specialty	Allotted Marks
5	Couch movement	Movement of couch for positioning patients; Remote controlled couch movements saves treatment time & avoid manual errors.	NA	2	Couch having an incorporated remote tracking system without any manual intervention at the treatment room.	2
9	MLC with number of leaf, leaf speed, width and field size along with availability of SRS and SRT facility	More number of leaves, Smaller leaf width at isocenter, Larger field size and Higher speed is preferred better treatment.	Nos	8	No. of leaf: > 120	8
			cm ²	3	Field size > 30 x 30	3
			NA	6	MLC having SRS and SRT facility	6
			cm/sec	6	Leaf speed > 2.5	6
19	Year of Launch of the quoted model	It indicates how latest the technology and the design is	NA	5	Within last 3 years	5
					Beyond 3 years but within 6 years	3

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High-End High-energy LINAC						
Sl. No.	Feature / Speciality	Explanation	Unit of Measurement	Full Marks	Quality Parameter	
					Feature / Specialty	Allotted Marks
5a	KV IGRT Imaging	Ability for imaging without entering in the treatment room-- saves time and avoid manual error.	NA	1	Availability of motorized robotic arm movement in all axes with remote control from Console without entering into the machine room during KV IGRT Imaging.	1
5b	Couch movement	Movement of couch for positioning patients; Remote controlled couch movements saves treatment time & avoid manual errors.	NA	1	Couch having an incorporated remote tracking system without any manual intervention inside the treatment room.	1
9a	MLC with number of leaf, leaf speed, width and field size along with availability of SRS and SRT facility	More number of leaves, Smaller leaf width at isocenter, Larger field size and Higher speed is preferred better treatment.	Nos	6	No. of leaf: > 120	6
			cm ²	3	Field size > 30 x 30	3
			NA	6	MLC having SRS and SRT facility	6
			cm/sec	6	Leaf speed > 2.5	6
9b	Integrated single MLC with 2.5 mm (SRS) alongwith 5 mm resolution	Better accuracy in SRS	NA	2	Availability	2
19	Year of Launch of basic platform of the quoted model	It indicates how latest the technology and the design is	NA	5	Within last 3 years	5
					Beyond 3 years but within 6 years	3

Amendment 22

Read the following (marked in red) in the **Quality Evaluation** under **Evaluation and Comparison** of Bids for **High-energy LINAC** at Page No. 20 & 21

High-energy LINAC						
Sl. No.	Feature / Speciality	Explanation	Unit of Measurement	Full Marks	Quality Parameter	
					Feature / Speciality	Allotted Marks
5	MLC with number of leaf and field size	More number of leaves and Larger field size are preferred for better treatment.	Nos	3	No. of leaf: > 80	3
			cm ²	3	Field size > 30 x 30	3
13	Number of already commissioned LINACS in India	It indicates that the model is preferred by the end Users.	NA	5	1 Marks for each for installations exceeding 15	Limited upto full marks

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High-energy LINAC						
Sl. No.	Feature / Speciality	Explanation	Unit of Measurement	Full Marks	Quality Parameter	
					Feature / Speciality	Allotted Marks
5	MLC with number of leaf and field size	More number of leaves and Larger field size are preferred for better treatment.	Nos	3	No. of leaf: > 120	3
			cm ²	3	Field size > 30 x 30	3
13	Year of Launch of basic platform of the quoted model	It indicates how latest the technology and the design is	NA	2	Within last 3 years	2
					Beyond 3 years but within 6 years	1
14	Number of already commissioned LINACS in India	It indicates that the model is preferred by the end Users.	NA	3	1 Marks for each for installations exceeding 15	Limited upto full marks

Amendment 23

Read the following (marked in red) in the **Quality Evaluation** under **Evaluation and Comparison of Bids** at Page No. 22

Treatment Planning System (TPS)						
Sl. No.	Feature / speciality	Explanation	Unit of Measurement	Full Marks	Quality Parameter	
					Feature/ speciality	Allotted marks
2.	Advanced library based intuitive fast and adaptive planning solution	Facilitates fast and accurate treatment planning	NA	10	Availability	10

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Treatment Planning System (TPS)						
Sl. No.	Feature / speciality	Explanation	Unit of Measurement	Full Marks	Quality Parameter	
					Feature/ speciality	Allotted marks
2.	Knowledge-based advanced library intuitive fast and adaptive planning solution	Facilitates fast and accurate treatment planning	NA	10	Availability	10

Amendment 24

The specifications for **DOSIMETRY AND QA EQUIPMENTS** at **PAGE NO. 83 TO 88** have been revised. The revised specifications has been given in the table below,

Sl. No.	Specification	Remarks	Quantities needed for 2 LINAC set up	Quantities needed for 1 LINAC set up
1	RADIATION THERAPY BEAM ANALYZER		1 set	1 set
	Require a full-fledged three dimensional Water Phantom & Dosimetry System and therapy beam analyser 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 rules. All components of the system and all available options are controlled by the same software that runs under Microsoft Windows . The system should suitable to measure pulsed radiation with fluctuation dose rate.	A robust and reliable 3D water phantom along with accessories are required for the fast commissioning of the linear accelerator		

Sl. No.	Specification	Remarks	Quantities needed for 2 LINAC set up	Quantities needed for 1 LINAC set up
2	Water phantom		1 set	1 set
	<p>The scanning volume should be large enough to scan and should not be less than 48x48X40 cm. It should be square in shape and the system should come with suitable thickness to the avoid bending of the tank's walls by water pressure and water absorption of the acrylic material. The reproducibility of a position should be ±0.1 mm throughout the whole phantom. The positioning tool should be there to allow easy and exact positioning of the chamber's geometrical centre 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/Pendant. The positioning speed should be adjustable upto 50mm/s. The acceleration of the step movement should also be changed as and when required. The zero point, reference point and limit of the different detector units should be stored separately in the control unit /Pendant. The control pendant should display the actual position of the chamber position at any given measuring time.</p> <p>The system should be capable of performing fast continuous mode / step by step mode. Availability of both the mode will be preferred.</p>	A rectangular/ square scanning volume make sures that the water phantom measurement correlates with the field of view of the LINAC, which is also square/rectangular. A higher reproducibility makes sures that the repeated measurements give the same value and a faster scanning helps in faster data collection and hence faster commissioning		
	2 nos of 0.13cc or 0.125 cc ion chambers, along with detector adapters and 2 nos of 5m cables should be provided	2 nos of 0.13cc or 0.125 cc chambers are needed for scanning and reference purpose.		
	The parent company should have direct service staffs in India, for smooth and efficient troubleshooting. The product should be robust and reliable and the parent company should have atleast 50 installed and working water phantom systems in India.	This make sures that the department gets a reliable and robust phantom, supported by the principal company from India		
3	Water reservoir		1 set	1 set
	<p>The water reservoir should be atleast 180 litres to store the water and can be pump and drain to the water phantom as quick as possible. The water Reservoir must be able to hold the entire weight of the water without any change. The weight of the whole assembly can be puss or pull though the wheel with polyethylene or equivalent. The lifting carriage should come with the technology that keeps the height absolutely accurate. The Lifting carriage and Water Reservoir should be separate /integrated for easy movements, must be imported and directly from the suppliers.The water reservoir should have a safety circuit that avoids the dry pump running.</p> <p>Automatic Lifting facility should be quoted mandatorily. Provision for leveling water phantom manually / automatically should be provided.</p>	Imported table and reservoir make sures that the accuracy and robustness is not compromised, even in the accessories division		

Sl. No.	Specification	Remarks	Quantities needed for 2 LINAC set up	Quantities needed for 1 LINAC set up
4	Control Unit		1 set	1 set
	A separate control unit for controlling the movement of the detector in any three directions should be possible. The control unit should permanently store zero point, reference point and limit points for water phantom. It should have a time constant of minimum 20ms and the leakage current should be less than 200fA.			
5	Control Computer		1 set	1 set
	The latest version of Windows 7/8 Professional computer/laptop (Intel i5/i7 processor, 8GB RAM, 500GB harddisk, 2GB Nvidia graphics card) should have all the latest feature with color FULL HD monitor and with printer/plotter (color) and branded UPS (30 min. back-up).	A powerful computer ensures that the system softwares run smoothly		
6	The Software		1 set	1 set
	<p>Fully workflow oriented acquisition and analysis software to increase efficiency and to reduce the commissioning and QA time of the LINAC should be provided with the following minimum properties:</p> <p>-Masy data exchange with ImRT software system -Support of all international and industry protocols -Licenses for installation of acquisition and analysis software on up to five workstations</p> <p>Common settings: -Complete settings in one window -Visibility of connected controller and electrometer Queue</p> <p>Set-Up: -Highlights discrepancies prior to measurement -Queues pre-defined though adaptive/flexible; measurements are prepared based on RTPS</p> <p>Requirements -Queue filtering and sorting base for grouping scans and optimization queues functions for modify, extend and exchange queues -Import of RFQ files (queue files)</p> <p>Data Acquisition: -1D, 2D and 3D data views -Online display of measurements and online data analysis of each scan controller panel.</p> <ul style="list-style-type: none"> • Central axis check facility • Adaptive scan optimization facility • Output factor table <p>Data Analysis: -Electron depth-curves/profiles photon depth-curves/profiles TPR/TMR -Isodose / Array calculation mathematics: add, multiply, subtract and divide curves data modification tools, e.g. rescale, move, mirror</p> <p>RTPS: -Generation of measurements queue data transfer plug-in module for new RTPS update</p> <p>Archiving / Printing:</p>	A user friendly and comprehensive software to complement the powerful water phantom		

Sl. No.	Specification	Remarks	Quantities needed for 2 LINAC set up	Quantities needed for 1 LINAC set up
	-Appropriate data archiving customized print templates creation and export of tables			
7	Administrative Data		1 set	1 set
	Comprehensive documentation of the measured data by automatic saving of the used measuring environment should simplify the interpretation of data even a long time. The used measuring routine data can be reused either unchanged or with some of the parameter changed. Data can be printed and plotted in numerical and graphical form on all printers and plotters that are supported by windows. The administrative data can be changed after saving the measuring data. All measuring data should furnished automatically with their administrative information and comprehensive filter function allows the easily selection of specific data. The necessary software to network the 3D TBA system with the existing 3D TPS in the department of Radiotherapy must be offered.			
8	Data Analysis			
	Various normalization should possible viz. normalization to maximum for depth dose curves, normalization to maximum or center for profiles and normalization to maximum, enter, position and value for isodose lines. Homogeneity and symmetry should calculated automatically and various national and international protocols can be selected. Depth dose curves can be analyses according to AERB protocols.			
9	ARRAY DETECTOR for IMRT& Rotational IMRT		2 sets	1set
	The device must be based on ion chamber matrix with more than 1000 detectors, having the facility to use with slab phantom for measurements and should be calibrated for FFF applications at high dose rate. The device should have a physical device to calculate the gantry angles for VMAT/Rapid Arc plans. The chamber must be a vented plane-parallel square shaped ion chambers with center to center spacing less than 8mm. It should be able to use for the dose verification of IMRT beams and routine quality control of high energy photon and electron beams by using the software. The device should include a temperature and pressure sensor to perform an automated correction of the chamber signal (optional). The software should allow for the Registration of measured vs planned data, Complete IMRT verification of measured vs. planned TPS data incl. 1D profiles, 2D isodose maps, automated verification such as sum, (absolute difference, correlation, multiplication, DTA (distance to agreement) calculation, Gamma analysis, including threshold and gamma angle Histograms (for data sets and results) Region (ROI) of interest analysis Time based analysis (tables) e.g. start-up License for complete DICOM for: Import of planned 2D and 3D data from all TPS	Ion chamber based detector array make sures that most accurate IMRT and Rotational IMRT QA is done. 1000+ detectors ensure that the spacial resolution of the array is superior and hence no information is lost. If the sampling time is less, this ensures that the data collection by the detector is very fast. So be best detector will have lower spacial resolution along with lower sampling time!		

Sl. No.	Specification	Remarks	Quantities needed for 2 LINAC set up	Quantities needed for 1 LINAC set up
	supporting DICOM RT and RTOG formats Import of EPID data via DICOM Interface to DICOM compatible scanners (e.g. Kodak CR, Agfa) via import of DICOM CR files			
	The parent company should have direct service staffs in India, for smooth and efficient troubleshooting. The product should be robust and reliable and the parent company should have atleast 25 installed and working IMRT QA systems in India.	This make sures that the department gets a reliable and robust Rotational IMRT QA device, supported by the principal company from India		
	A pin point chamber should be provided for small field IMRT QA	.01cc chambers are ideal for very small field IMRT QA		
10	Machine QA and Daily QA		2 sets	1 set
	A comprehensive daily machine QA ion chamber based detector should be provided. There should be atleast 300 ion chambers for precise measurement. The system should be capable of giving the parameters like analysis of symmetry, flatness, penumbra, field width, energy verification, dose output in a single exposure. Additionally, it should be able to perform MLC and wedge check, light field vs. radiation field congruence and LINAC start-up behaviour. The software should be capable of automated archiving in database, advanced grouping, filtering & sorting, simple export of data to Microsoft Excel, Water phantom software and IMRT software with only one click. If the IMRT detector offered earlier is able to perform the above tests, then the vendor is allowed to quote for only the software needed for performing the daily QA with the IMRT ion chamber array. Additional independent daily and monthly QA device for checking central axis deviation, flatness, symmetry, beam quality factor should be provided and it should be operated either wired or wirelessly.	Advanced LINAC QA solution needed for the daily/weekly LINAC check		
11	Absolute Dosimetry and Detectors		2 sets	1set
	A reference class electrometer with TNC connector, with a sampling time of minimum 20ms should be provided. A farmer chamber 0.65cc or 0.6 cc, 0.4cc parallel plate chamber and 18m long triax cables with TNC connectors should be provided. Adequate build-up caps for (6MV and 15MV) farmer chamber should be also provided. All chambers supplied should be water-proof and should have TNC/M type connection.	Reference class electrometer helps in cross calibration of chambers and TNC connector makes sure that the elctrometer can work with any TNC chamber		
	The following items should be included in the absolute dosimetry package - imported RW3 slab phantom of 30x30cm with adapter plates for CC, FC and PPC, imported fluke survey meter, a local D10/20 phantom, an imported at least 25 cm variable depth phantom with chamber insert for FC and CC, digital calibrated thermometer and barometer. 30x30x30 cm fixed depth absolute dosimetry phantom to be provided	Essential items needed for Absolute dosimetry		

Sl. No.	Specification	Remarks	Quantities needed for 2 LINAC set up	Quantities needed for 1 LINAC set up
12	SRS/SRT QA		1set	1set
	The following items should be quoted for SRS/SRT QA:			
	1. Reference diode detector along with Stereotactic diode detector	Mandatory package for SRS/SRT QA		
	2. Photon and Electron field detector	Necessary package for SRS/SRT QA		
	3. Dedicated array detector for SRS & SRT QA / Software solution for SRS & SRT QA.	These items ensure that the SRS/SRT QA done is of high quality		
13	Warranty & Service Facilities			
	Five year warranty on all products should be provided. Factory trained Application specialist should be available in India to look after the installation and maintenance of the systems.	Make sure that you get the best support always		
14	Additional item to be included			
	1) 5 boxes of 8x10 inches & 5 boxes of 14x17 inches Gafchromic film for QA purpose		1 Set	1 Set
	2) Imported Specific phantom for image verification			
	3) Digital pocket dosimeter – 04 number			
	4) A3 Flat bed film scanner with necessary software for dosimetry analysis			
	5) Iso-alignment device for verification of the iso-centre and light field congruence			
	6) Dedicated phantom for IMRT (both homogeneous and incorporating inhomogeneities mimicking actual patient anatomy like lung etc) for all steps from imaging to dose verification and SRS (including capabilities of imaging, image fusion, absolute, relative and point-dose dosimetry measurements at isocenter and at exact positions off isocenter. This should allow for a seamless evaluation of dose as well as geometric accuracy, including CBCT and MV/kV alignment.		1 Set	1 Set
Vendor must add necessary dosimetry & QA equipments, which they feel to be essential for their offered machine but not mentioned in this tender document				

Amendment 25

Read the following (marked in red) under **F. Miscellaneous** at Page No. 89

4. Immobilization Devices (Following Mould Room equipments are to be provided)

AS

4. Immobilization Devices (Following Mould Room equipments are to be provided)

All the products should be imported, if available and all immobilization devices must have certified dosimetric property for different energy. All immobilization system must be with suitable storage cabinet.

Amendment 26

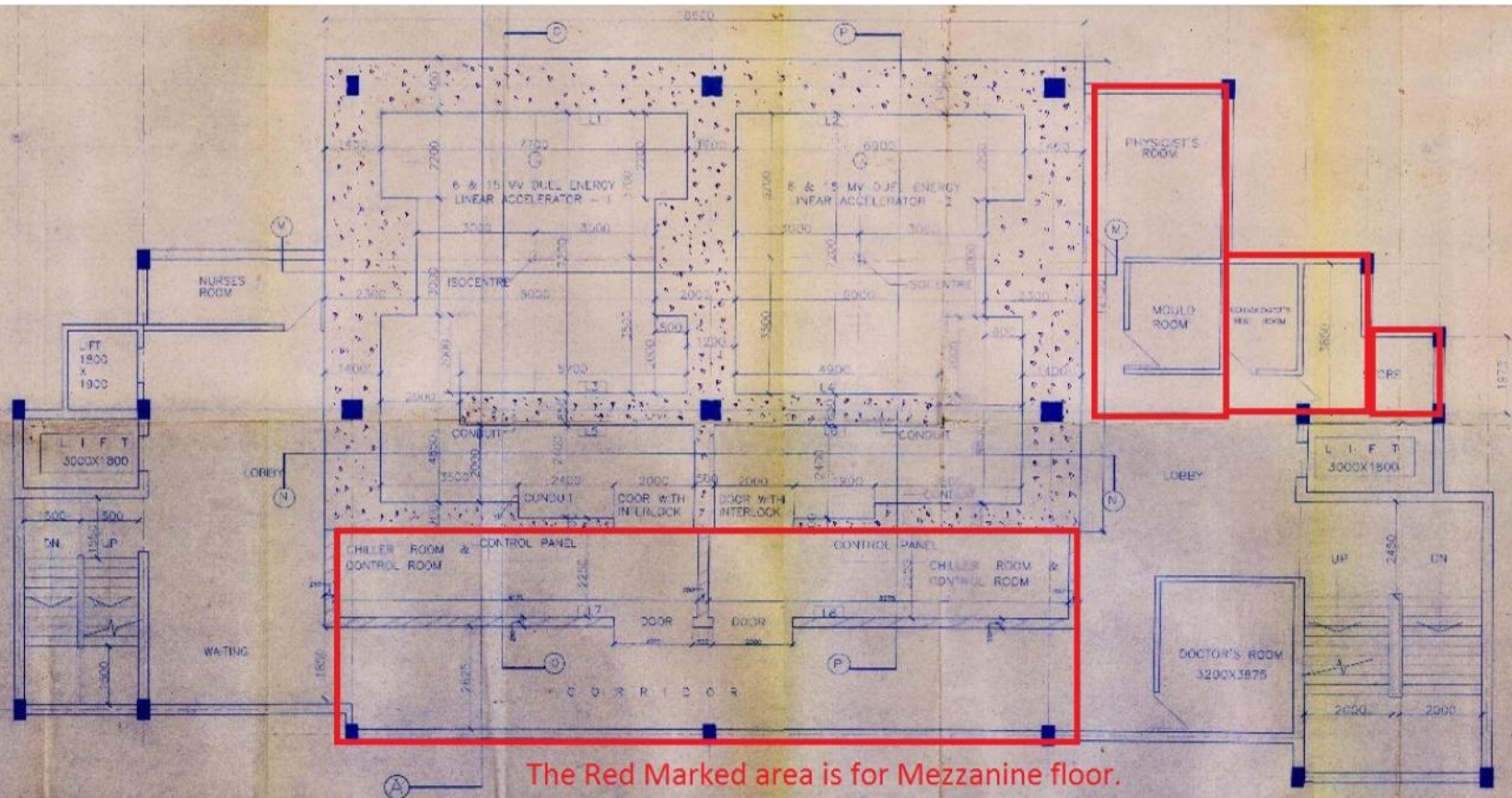
The following has been added in the Turnkey scope of R.G. Kar MCH :

Construction of mezzanine floor over the areas marked in the layout plan as Chiller room, Control room of both LINAC, Corridor, Physicist room, Mould room, Technologist's room, Store. The drawing is attached.

Amendment 27

The following has been added in the Specifications for TPS

Sufficient backup facility for storage of all information related to imaging, planning and treatment of patient for 10 years with NAS Drive (minimum 20 TB usable space) with RAID facility.



The Red Marked area is for Mezzanine floor.

REVISED/ APPROVED

[Signature]
 Being issued for the purpose of...
 Date of issue...
 Date of expiry...

[Signature]
 Being issued for the purpose of...
 Date of issue...
 Date of expiry...
 M. S. Dr. Madhava Chandra
 20.9.95