

**Notice Inviting e-Tender**  
**West Bengal Medical Services Corporation Limited**  
**Swasthya Sathi**  
**GN-29, Salt Lake, Sector-V**  
**Kolkata-700091**

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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-51 /2016

Dated- 15.09.2016

(2<sup>nd</sup> Call of Bid Ref. No.: WBMSCL/NIT-45 /2016, Dated- 05.08.2016)

## **Amendment 2**

**Read** Clause 4(b).4 (marked in red below) at Page No. 6 under Terms and Mode of Payment under Section I: Instruction to Tenderers

4(b).4 **Payment for Goods to be Imported from Abroad:** Irrevocable and non – transferable LC shall be opened, However, if the Supplier requests specifically to open confirmed LC, the extra charges would be borne by the Supplier. If LC is required to be extended and/or amended for reasons not attributable to the Purchaser/Consignee, the charges thereof shall be borne by the Supplier.

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4(b).4 **Payment for Goods to be Imported from Abroad:** Irrevocable and non – transferable **100%** LC shall be opened, However, if the Supplier requests specifically to open confirmed LC, the extra charges would be borne by the Supplier. If LC is required to be extended and/or amended for reasons not attributable to the Purchaser/Consignee, the charges thereof shall be borne by the Supplier.

## Amendment 3

**Read** Clause 7 (marked in red below) at Page No. 7 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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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.
However, if repairing of the machine requires replacement of Accelerating wave guide, Electron Gun, Target, RF driver, Klystron / Magnetron and any vacuum part, penalty will be charged at the rate of Rs 60000/- per 24 hours or part thereof for down time after 72 hours.

## Amendment 4

**Read** the following Paragraph (marked in red below) at Page No. 22 under Clause 34 under F. Evaluation and Comparison of Bid under Section I: Instruction to Tenderers

The total score of a bidder would be obtained by multiplying the Quality and Cost Scores of the bidder by the pre-defined weightages assigned, and adding them together. The weightages assigned for Cost Score and Quality Score would be 40 and 60 respectively. The bidder securing the highest total score would ordinarily be selected.

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The total score of a bidder would be obtained by multiplying the Quality and Cost Scores of the bidder by the pre-defined weightages assigned, and adding them together. The weightages assigned for Cost Score and Quality Score would be 35 and 65 respectively. The bidder securing the highest total score would ordinarily be selected.

### Amendment 5

**Read** the following (marked in red below) at Page No. 29 under **Quality Evaluation** under F. Evaluation and Comparison of Bid under Section I: Instruction to Tenderers

Marks for Quality and corresponding Scores for bidders is noted in the table below,

Bidder	Sub-Total of Marks for Quality in			Total of Marks for Quality out of 100 is (D) = [(A) + (B) + (C)]/2	Score for Quality (E) = (D)	Weighted Score for Quality (S <sub>wq</sub> ) = (E) * 60%
	High-end High energy LINAC (A)	High energy LINAC (B)	Treatment Planning System (C)			
Bidder 1	80	55	35	85	85	51
Bidder 2	56	43	17	58	58	34.80
Bidder 3						

#### Evaluation of Cost

Financial bids will be opened after the technical evaluation is concluded and uploaded on the e-tender portal. Financial quotes of the bidders would be converted to score by multiplying the lowest financial quote with the quote of the bidder and divided by 100. An illustration of conversion of marks into score has been given in the table below,

Bidder	Financial Quote (F)	Cost Score [(LFQ/F)*100]
Bidder 1	650000000	[(50000000 /65000000)*100] = 76.92
Bidder 2	500000000	[(50000000 /50000000)*100] = 100

LFQ= Lowest Financial quote

The bidder offered lowest cost has been assigned a financial score of 100 and the other bidders have scored financial scores that are inversely proportional to their quotes.

#### Selection of Bidder

The bid of a Bidder will be ranked in the Quality- and Cost-Based Selection (QCBS) method based on the total score obtained by the bidder in the evaluation of cost and as well as in the evaluation of quality using the weights of 40% and 60% for the "cost" and the "quality" respectively.

A ready reckoner for Combined Quality and Cost Score (CQCS) with weightage 60:40 is given in the table below,

Bidder	Quality Score (E)	Weighted Quality Score (S <sub>wq</sub> ) = (E) * 60%	Cost Score (F)	Weighted Cost Score (S <sub>wc</sub> ) = (F) * 40%	Combined Quality and Cost Score (CQCS) (S <sub>wqc</sub> ) = (S <sub>wq</sub> ) + (S <sub>wc</sub> )	Remarks
Bidder 1	85	51	76.92	30.77	81.77	Selected
Bidder 2	58	34.8	100.00	40.00	74.80	
Bidder 3						

The bidder obtaining Highest Combined Quality and Cost Score (CQCS) would be selected awarded the contract.

**As**

Marks for Quality and corresponding Scores for bidders is noted in the table below,

Bidder	Sub-Total of Marks for Quality in			Total of Marks for Quality out of 100 is (D) = [(A) + (B) + (C)]/2	Score for Quality (E) = (D)	Weighted Score for Quality (S <sub>wq</sub> ) = (E) * 65%
	High-end High energy LINAC (A)	High energy LINAC (B)	Treatment Planning System (C)			
Bidder 1	80	55	35	85	85	55.25
Bidder 2	56	43	17	58	58	37.70
Bidder 3						

### Evaluation of Cost

Financial bids will be opened after the technical evaluation is concluded and uploaded on the e-tender portal. Financial quotes of the bidders would be converted to score by dividing the lowest financial quote by the quote of the bidder and multiplying by 100. An illustration of conversion of marks into score has been given in the table below,

Bidder	Financial Quote (F)	Cost Score [(LFQ/F)*100]
Bidder 1	650000000	[(50000000 / 650000000)*100] = 76.92
Bidder 2	500000000	[(50000000 / 500000000)*100] = 100

LFQ = Lowest Financial quote

The bidder offered lowest cost has been assigned a financial score of 100 and the other bidders have scored financial scores that are inversely proportional to their quotes.

### Selection of Bidder

The bid of a Bidder will be ranked in the Quality- and Cost-Based Selection (QCBS) method based on the total score obtained by the bidder in the evaluation of cost and as well as in the evaluation of quality using the weights of 35% and 65% for the "cost" and the "quality" respectively.

A ready reckoner for Combined Quality and Cost Score (CQCS) with weightage 65:35 is given in the table below,

Bidder	Quality Score (E)	Weighted Quality Score (S <sub>wq</sub> ) = (E) * 65%	Quality Cost Score (F)	Weighted Cost Score (S <sub>wc</sub> ) = (F) * 35%	Cost	Combined Quality and Cost Score (CQCS) (S <sub>wqc</sub> ) = (S <sub>wq</sub> ) + (S <sub>wc</sub> )	Remarks
Bidder 1	85	55.25	76.92	26.92		82.17	Selected
Bidder 2	58	37.70	100.00	35.00		72.70	
Bidder 3							

The bidder obtaining Highest Combined Quality and Cost Score (CQCS) would be selected awarded the contract.

## Amendment 6

**Read** the following (marked in red) at Page No.23 & 24 under **Quality Evaluation** under **F. Evaluation and Comparison of Bids**

High-End High-energy LINAC						
Sl. No.	Feature / Speciality	Explanation	Unit of Measurement	Full Marks	Quality Parameter	
					Feature / Specialty	Allotted Marks
1	Dose Rate for Photon Radiation Therapy	Strength of radiation. Higher dose rate implies shorter treatment time which results in less patient movement and better treatment.	MU/min	5	600 MU/min for 3 Photon energies (6, 10 & 15 MV)	5
					600 MU/min for 2 Photon energies (6 & 10 MV)	3
					600 MU/min for 1 Photon energy	1.5
2	Dose Rate for Electron Therapy	Strength of Electron energy. Higher Electron Dose Rate is beneficial for treatment of breast and superficial tumors.	MU/min	3	601 -700 MU/Min	0.5
			cm <sup>2</sup>	3	701 -800 MU/Min	1
			NA	6	801 -900 MU/Min	2
			cm/sec	6	Above 900 MU/Min	3
5	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

High-End High-energy LINAC						
Sl. No.	Feature / Speciality	Explanation	Unit of Measurement	Full Marks	Quality Parameter	
					Feature / Specialty	Allotted Marks
8	Dynamic Adaptive Radiotherapy including adaptive re-planning treatment (DART) as an integrated system	It is useful to address the tumor pattern change / tumor shrinkage in between the treatment cycle	NA	3	Availability of DART	3
12	Portal Dosimetry availability	Precise online verification of dose before/during delivery of radiation for treatment	NA	3	Availability of Portal Dosimetry	3

## AS

High-End High-energy LINAC						
Sl. No.	Feature / Speciality	Explanation	Unit of Measurement	Full Marks	Quality Parameter	
					Feature / Specialty	Allotted Marks
1	Dose Rate for Photon Radiation Therapy	Strength of radiation. Higher dose rate implies shorter treatment time which results in less patient movement and better treatment.	MU/min	5	600 MU/min for 3 Photon energies (6, 10 & 15 MV)	5
					600 MU/min for 2 Photon energies (6 & 10 /15 MV)	3
					600 MU/min for 1 Photon energy	1.5
2	Dose Rate for Electron Therapy	Strength of Electron energy. Higher Electron Dose Rate is beneficial for treatment of breast and superficial tumors.	MU/min	3	501 -700 MU/Min	0.5
					701 -800 MU/Min	1
					801 -900 MU/Min	2
					Above 900 MU/Min	3

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	Lower than 3.0 MV X-Ray imaging capability	Useful for soft tissue contrast at low dose to the patient	NA	2	Available	2
8	Dynamic Adaptive Radiotherapy including adaptive re-planning treatment (DART) as an integrated system	It is useful to address the tumor pattern change / tumor shrinkage in between the treatment cycle	NA	2	Availability of DART	2
12	Portal Dosimetry availability	Precise online verification of dose before/during delivery of radiation for treatment	NA	2	Availability of Portal Dosimetry	2

## Amendment 7

**Read** the following (marked in red) at Page No. 26 & 27 under **Quality Evaluation** under **F. Evaluation and Comparison of Bids**

High-energy LINAC						
Sl. No.	Feature / Speciality	Explanation	Unit of Measurement	Full Marks	Quality Parameter	
					Feature / Specialty	Allotted Marks
1	Dose Rate for Photon Radiation Therapy	Strength of radiation. Higher dose rate implies shorter treatment time which results in less patient movement and better treatment.	MU/min	5	600 MU/min for 3 Photon energies (6, 10 & 15 MV)	5
					600 MU/min for 2 Photon energies (6 & 10 MV)	3
					600 MU/min for 1 Photon energy	1.5

High-energy LINAC						
Sl. No.	Feature / Speciality	Explanation	Unit of Measurement	Full Marks	Quality Parameter	
					Feature / Specialty	Allotted Marks
2	Dose Rate for Electron Therapy	Strength of Electron energy. Higher Electron Dose Rate is beneficial for treatment of breast and superficial tumors.	MU/min	3	601 -700 MU/Min	0.5
					701 -800 MU/Min	1
					801 -900 MU/Min	2
					Above 900 MU/Min	3
4	Regular automated QA checks	It is daily automated QA checks to ensure proper functioning of the LINAC. Automated checks save time & labour.	NA	5	Available	5

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High-energy LINAC						
Sl. No.	Feature / Speciality	Explanation	Unit of Measurement	Full Marks	Quality Parameter	
					Feature / Specialty	Allotted Marks
1	Dose Rate for Photon Radiation Therapy	Strength of radiation. Higher dose rate implies shorter treatment time which results in less patient movement and better treatment.	MU/min	5	600 MU/min for 3 Photon energies (6, 10 & 15 MV)	5
					600 MU/min for 2 Photon energies (6 & 10/15 MV)	3
					600 MU/min for 1 Photon energy	1.5
2	Dose Rate for Electron Therapy	Strength of Electron energy. Higher Electron Dose Rate is beneficial for treatment of breast and superficial tumors.	MU/min	3	501 -700 MU/Min	0.5
					701 -800 MU/Min	1
					801 -900 MU/Min	2
					Above 900 MU/Min	3
4a	Regular automated QA checks	It is daily automated QA checks to ensure proper functioning of the LINAC. Automated checks save time & labour.	NA	3	Available	3
4b	Lower than 3.0 MV X-Ray imaging capability	Useful for soft tissue contrast at low dose to the patient	NA	2	Available	2

## Amendment 8

Read the following (marked in red) at Page No. 29 under Quality Evaluation under F. Evaluation and Comparison of Bids

Treatment Planning System (TPS)						
Sl. No.	Feature / speciality	Explanation	Unit of Measurement	Full Marks	Quality Parameter	
					Feature/ speciality	Allotted marks
1.	Deformable registration facility	Facilitates the modification of treatment plan as per clinical requirement during treatment	NA	10	Availability	10
2.	Knowledge- based or equivalent advanced library based intuitive fast and adaptive planning solution	Facilitates fast and accurate treatment planning and adaptive planning solution	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
1.	Deformable registration facility	Facilitates the modification of treatment plan as per clinical requirement during treatment	NA	10	Vendor's own solution providing facility for all patient's information in the same data base. (It facilitates proper compatibility as well as prompt & guaranteed service).	10
					Feature provided as third party solution	5
2.	Knowledge- based or equivalent advanced library based intuitive fast and adaptive planning solution	Facilitates fast and accurate treatment planning	NA	10	Availability as vendor's own solution. (It facilitates proper compatibility as well as prompts & guaranteed service).	10
					Availability as third party vendor	5

**Amendment 9** Read the following clause (marked in red) at Page No. 32 under **G. Award of Contract**

**45. Performance Security**

45.1 Within 14 days of receipt of the AOC from WBMSCL, the successful Tenderer, if required, shall furnish the Performance Security in full or in parts in the event of a staggered supply as decided by WBMSCL in accordance with the GCC, using for that purpose the Performance Security Form included in Section VI, Contract forms, or another Form acceptable to WBMSCL. WBMSCL shall promptly discharge the Bid Securities of the unsuccessful Tenderers pursuant to Instructions to Tenderers.

**As**

**45. Performance Security**

45.1 Within 21 days of receipt of the AOC from WBMSCL, the successful Tenderer, if required, shall furnish the Performance Security in full or in parts in the event of a staggered supply as decided by WBMSCL in accordance with the GCC, using for that purpose the Performance Security Form included in Section VI, Contract forms, or another Form acceptable to WBMSCL. WBMSCL shall promptly discharge the Bid Securities of the unsuccessful Tenderers pursuant to Instructions to Tenderers.

**Amendment 10**

**Read** the following (marked in red) at Page No. 49 under **Technical Specifications for High End High Energy Linear Accelerator (LINAC)**

Electron beams of at least 5 energies between 4-18 MeV or above. Latest model & technology should be offered. Year of Type approval of AERB should be mentioned. More preference will be given to higher electron energy & more number of photon energy in between 6 & 15 MV.

**As**

Electron beams of at least 4 energies between 4-18 MeV or above. Latest model & technology should be offered. Year of Type approval of AERB should be mentioned. More preference will be given to higher electron energy & more number of photon energy in between 6 & 15 MV.

**Amendment 11**

**Read** the following (marked in red) at Page No. 52 under **Technical Specifications for High End High Energy Linear Accelerator (LINAC)**

**C. ELECTRON BEAM CHARACTERISTICS:**

1. **Electron Beam Energy:** Minimum 5 electron energies between 4 – 18 MeV to be specified. Energy shall be specified as the most probable energy (Ep) of the electron energy spectrum at 100 cm from the accelerator exit window. **Higher dose rate will be preferred.**
2. **Dose rate:** The dose rate at isocentre for each electron energy should be 600 MU/min or more. Specify whether the dose rate variation mode is continuous or not. **Higher dose rate will be preferable.**

As

**C. ELECTRON BEAM CHARACTERISTICS:**

1. **Electron Beam Energy:** Minimum 4 electron energies between 4 – 18 MeV to be specified. Energy shall be specified as the most probable energy (Ep) of the electron energy spectrum at 100 cm from the accelerator exit window. **Higher dose rate will be preferred.**
2. **Dose rate:** The dose rate at isocentre for each electron energy should be 500 MU/min or more. Specify whether the dose rate variation mode is continuous or not. **Higher dose rate will be preferable.**

## Amendment 12

Read the following (marked in red) at Page No. 69 under **Technical Specifications for High Energy Linear Accelerator (LINAC)**

**C. ELECTRON BEAM CHARACTERISTICS:**

1. **Electron Beam Energy:** Minimum 5 electron energies between 4 – 18 MeV to be specified. Energy shall be specified as the most probable energy (Ep) of the electron energy spectrum at 100 cm from the accelerator exit window.
2. **Dose rate:** The dose rate at isocentre for each electron energy should be 600 MU/min or more. Specify whether the dose rate variation mode is continuous or not. **Higher dose rate will be preferable.**

As

**C. ELECTRON BEAM CHARACTERISTICS:**

1. **Electron Beam Energy:** Minimum 4 electron energies between 4 – 18 MeV to be specified. Energy shall be specified as the most probable energy (Ep) of the electron energy spectrum at 100 cm from the accelerator exit window.
2. **Dose rate:** The dose rate at isocentre for each electron energy should be 500 MU/min or more. Specify whether the dose rate variation mode is continuous or not. **Higher dose rate will be preferable.**

## Amendment 13

**Read** the following (marked in red) at Page No. 58 under **Technical Specifications for High-end High Energy Linear Accelerator (LINAC)**

### **Chiller system**

The vendor should provide a fully automatic water chiller system for sufficient cooling of the linear accelerator. The chiller system must be imported one and fully compatible with the machine as per specifications of the manufacturer. The chiller system shall incorporate automatic back-up facilities, remote control and alarm panel with warning facilities.

**As**

### **Chiller system**

The vendor should provide a fully automatic water chiller system for sufficient cooling of the linear accelerator. The chiller system must be imported/export quality with backup compressor and fully compatible with the machine as per specifications of the manufacturer. The chiller system shall incorporate automatic back-up facilities, remote control and alarm panel with warning facilities.

## Amendment 14

**Read** the following (marked in red) at Page No. 98-99 under **The Scope of Work for Turnkey**

The room wise details of the interior works shall be undertaken by the supplier at the LINAC centres of the Medical Colleges has been detailed in the table below,

Sl.	Room	R G Kar MCH	NRS MCH	MCH, Kolkata	Interior works (Civil & lighting)
1	LINAC Treatment Room	2	2	1	Wall up to false ceiling & Floor ( Granite) False ceiling, Skylight, Lighting
2	Control room	2	2	1	Wall up to false ceiling & Floor ( Granite) False ceiling, Lighting
3	Equipment room	1	1	1	Floor ( Kota), Wall up 2100 mm (Ceramic tiles), Lighting
4	Changing enclosure (Within LINAC with Curtain)	2	2	1	Wall up to false ceiling & Floor ( Granite) False ceiling, Lighting
5	Treatment Planning Room	1	1	1	Wall up to false ceiling & Floor ( Premier Tiles) False ceiling, Lighting
6	Mould room	1	1	1	Wall up to 2100 mm & Floor ( Premier Tiles) Lighting

7	Physics Accessories Room	1	1	1	Floor ( Kota), Wall up to 2100 mm (Ceramic Tiles), Lighting
8	Nursing station	1	1	1	Wall up to false ceiling & Floor ( Premier Tiles) False ceiling, Lighting
9	Technician room	1	1	1	Wall up to false ceiling & Floor ( Premier Tiles) False ceiling, Lighting
10	Physicist room	1	1	1	Wall up to false ceiling & Floor ( Premier Tiles) False ceiling, Lighting
11	Doctor's room	1	2	3	Wall up to false ceiling & Floor ( Premier Tiles) False ceiling, Lighting
12	Patient waiting area	1	1	1	Wall up to false ceiling & Floor ( Granite) False ceiling, Lighting
13	Chiller room	1	1	1	Wall up to 2100 mm - Ceramic Tiles, Floor- Kota, Lighting
14	UPS Room enclosure	2	1	1	Wall up to 2100 mm - Ceramic Tiles, Floor- Kota, Lighting
15	AHU room	1	1	NA	Wall up to 2100 mm - Ceramic Tiles, Floor- Kota, Lighting

**As**

The room wise details of the interior works shall be undertaken by the supplier at the LINAC centres of the Medical Colleges has been detailed in the table below,

Sl.	Room	R G Kar MCH	NRS MCH	MCH, Kolkata	Interior works (Civil & lighting)
1	LINAC Treatment Room	2	2	1	Wall up to false ceiling & Floor ( Granite) False ceiling, Skylight, Lighting
2	Control room	2	2	1	Wall up to false ceiling & Floor ( Granite) False ceiling, Lighting
3	Equipment room	1	1	1	Floor ( Kota), Wall up 2100 mm (Ceramic tiles), Lighting
4	Changing enclosure (Within LINAC with Curtain)	2	2	1	Wall up to false ceiling & Floor ( Granite)

					False ceiling, Lighting
5	Treatment Planning Room	1	1	1	Wall up to false ceiling & Floor ( Premier Tiles) False ceiling, Lighting
6	Mould room	1	1	NA	Wall up to 2100 mm & Floor ( Premier Tiles) Lighting
7	Physics Accessories Room	1	1	NA	Floor ( Kota), Wall up to 2100 mm (Ceramic Tiles), Lighting
8	Nursing station	1	1	NA	Wall up to false ceiling & Floor ( Premier Tiles) False ceiling, Lighting
9	Technician room	1	1	NA	Wall up to false ceiling & Floor ( Premier Tiles) False ceiling, Lighting
10	Physicist room	1	1	NA	Wall up to false ceiling & Floor ( Premier Tiles) False ceiling, Lighting
11	Doctor's room	1	2	NA	Wall up to false ceiling & Floor ( Premier Tiles) False ceiling, Lighting
12	Patient waiting area	1	1	1	Wall up to false ceiling & Floor ( Granite) False ceiling, Lighting
13	Chiller room	1	1	1	Wall up to 2100 mm - Ceramic Tiles, Floor- Kota, Lighting
14	UPS Room enclosure	2	1	1	Wall up to 2100 mm - Ceramic Tiles, Floor- Kota, Lighting
15	AHU room	NA	NA	NA	Wall up to 2100 mm - Ceramic Tiles, Floor- Kota, Lighting

## Amendment 15

**Read** the following (marked in red) at Page No. 106 under **13. Miscellaneous** under **The Scope of Work for Turnkey**

LIST OF ITEMS AND SUGGESTED MANUFACTURERS/BRANDS		
Sl. No.	ITEMS	PREFERRED MAKES
E	SKY LIGHT	TWO VENDORS

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LIST OF ITEMS AND SUGGESTED MANUFACTURERS/BRANDS		
Sl. No.	ITEMS	PREFERRED MAKES
E	SKY LIGHT	Bajaj/CISCA/Creative

## Amendment 16

Read the following (marked in red) at Page No. 77 under **Technical Specifications** for **High Energy Linear Accelerator**

In addition, separate control console/s, where specifically warranted, for other add-ons such as for specific IMRT, IGRT (including respiratory motion control, gating, tracking etc.), kV CBCT and matching / correction with DRRs and / or planning CTs, SRS, SRT, SBRT etc. to be provided with all necessary hardware and software solutions as required.

As

In addition, separate control console/s, where specifically warranted, for other add-ons such as for specific IMRT, IGRT (including respiratory motion control, gating, tracking etc.), kV CBCT and matching / correction with DRRs and / or planning CTs etc. to be provided with all necessary hardware and software solutions as required.

## Amendment 17:

The following format has been introduced in the tender documents for obtaining item wise cost for Dosimetry and QA Equipments ,

### Form 8(c): ITEM WISE COST FOR DOSIMETRY AND QA EQUIPMENTS

DOSIMETRY & QA EQUIPMENTS TO BE MADE OF EITHER IBA OR PTW AS PER THE FOLLOWING SPECIFICATIONS.

Sl. No.	Specification	Remarks	Quantities needed for 2 LINAC set up	Quantities needed for 1 LINAC set up	Total Quantity Required for 6 LINAC machines (Q)	Rate per unit in USD (R)	Total amount for 6 LINAC machines in USD (T) = (Q) X (R)
1	RADIATION THERAPY BEAM ANALYZER		1 set	1 set	3 sets		

Sl. No.	Specification	Remarks	Quantities needed for 2 LINAC set up	Quantities needed for 1 LINAC set up	Total Quantity Required for 6 LINAC machines (Q)	Rate per unit in USD (R)	Total amount for 6 LINAC machines in USD (T) = (Q) X (R)
	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					
<b>2</b>	<b>Water phantom</b>		<b>1 set</b>	<b>1 set</b>	<b>3 sets</b>		
	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	A rectangular/ square scanning volume makes sure that the water phantom measurement correlates with the field of view of the LINAC, which is also square/rectangular. A higher reproducibility makes sure that the repeated measurements give the same value and a faster scanning helps in faster data collection and hence faster commissioning					

Sl. No.	Specification	Remarks	Quantities needed for 2 LINAC set up	Quantities needed for 1 LINAC set up	Total Quantity Required for 6 LINAC machines (Q)	Rate per unit in USD (R)	Total amount for 6 LINAC machines in USD (T) = (Q) X (R)
	position at any given measuring time. The system should be capable of performing fast continuous mode / step by step mode. Availability of both the mode will be preferred.						
	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					
<b>3</b>	<b>Water reservoir</b>		<b>1 set</b>	<b>1 set</b>	<b>3 sets</b>		
	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. Automatic Lifting facility should be quoted mandatorily. Provision for leveling water phantom manually / automatically should be provided.	Imported table and reservoir make sures that the accuracy and robustness is not compromised, even in the accessories division					
<b>4</b>	<b>Control Unit</b>		<b>1 set</b>	<b>1 set</b>	<b>3 sets</b>		
	A separate control unit for controlling the movement of the detector in any						

Sl. No.	Specification	Remarks	Quantities needed for 2 LINAC set up	Quantities needed for 1 LINAC set up	Total Quantity Required for 6 LINAC machines (Q)	Rate per unit in USD (R)	Total amount for 6 LINAC machines in USD (T) = (Q) X (R)
	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.						
<b>5</b>	<b>Control Computer</b>		<b>2 set</b>	<b>1 set</b>	<b>6 sets</b>		
	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					
<b>6</b>	<b>The Software</b>		<b>1 set</b>	<b>1 set</b>	<b>3 sets</b>		
	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: -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 Common settings: -Complete settings in one window -Visibility of connected controller and electrometer Queue Set-Up: -Highlights discrepancies prior to measurement -Queues pre-defined though adaptive/flexible; measurements are prepared based on RTPS 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) Data Acquisition: -1D, 2D and 3D data views -Online display of measurements and	A user friendly and comprehensive software to complement the powerful water phantom					

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	<p>online data analysis of each scan controller panel.</p> <ul style="list-style-type: none"> <li>Central axis check facility</li> <li>Adaptive scan optimization facility</li> <li>Output factor table</li> </ul> <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            RTPS:            -Generation of measurements queue            data transfer plug-in module for new RTPS update            Archiving / Printing:            -Appropriate data archiving            customized print templates creation and export of tables</p>						
7	<b>Administrative Data</b>		1 set	1 set	3 sets		
	<p>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.</p>						
8	<b>Data Analysis</b>		1 set	1 set	3 sets		
	<p>Various normalization should possible viz. normalization to maximum for depth dose curves, normalization to maximum or center for profiles and</p>						

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	normalization to maximum, enter, position and value for isodose lines. Homogeneity and symmetry should be calculated automatically and various national and international protocols can be selected. Depth dose curves can be analysed according to AERB protocols.						
9	<b>ARRAY DETECTOR for IMRT &amp; Rotational IMRT</b>		2 sets	1 set	6 sets		
	The device must be based on ion chamber matrix with more than 1000 detectors, having the facility to use with dedicated phantom with 3D dosimetry system having facility for measurements of IMRT/ VMAT/Rapid-Arc and should be calibrated for FFF applications at high dose rate. The device should come with 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, DVH, 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 supporting DICOM RT	Ion chamber based detector array makes sure that most accurate IMRT and Rotational IMRT QA is done. 1000+ detectors ensure that the spatial 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 the best detector will have lower spatial resolution along with lower sampling time!					

Sl. No.	Specification	Remarks	Quantities needed for 2 LINAC set up	Quantities needed for 1 LINAC set up	Total Quantity Required for 6 LINAC machines (Q)	Rate per unit in USD (R)	Total amount for 6 LINAC machines in USD (T) = (Q) X (R)
	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 makes sure 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					
<b>10</b>	<b>Machine QA and Daily QA</b>		<b>2 sets</b>	<b>1 set</b>	<b>6 sets</b>		
	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	Advanced LINAC QA solution needed for the daily/weekly LINAC check					

Sl. No.	Specification	Remarks	Quantities needed for 2 LINAC set up	Quantities needed for 1 LINAC set up	Total Quantity Required for 6 LINAC machines (Q)	Rate per unit in USD (R)	Total amount for 6 LINAC machines in USD (T) = (Q) X (R)
	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.						
11	<b>Absolute Dosimetry and Detectors</b>		2 sets	1set	6 sets		
	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					
12	<b>SRS/SRT QA</b>		1set	1set	3 set		
	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					

Sl. No.	Specification	Remarks	Quantities needed for 2 LINAC set up	Quantities needed for 1 LINAC set up	Total Quantity Required for 6 LINAC machines (Q)	Rate per unit in USD (R)	Total amount for 6 LINAC machines in USD (T) = (Q) X (R)
13	<b>Warranty &amp; Service Facilities</b>						
	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	<b>Additional item to be included</b>		<b>1 Set</b>	<b>1 Set</b>	<b>3 sets</b>		
	1) 5 boxes of 8x10 inches & 5 boxes of 14x17 inches Gafchromic film for QA purpose						
	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.						
<b>Total for 6(six) LINAC machines</b>							
<i>(To be fed in the designated cell under Rate in the BOQ)</i>							
Note: 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 18:

The following format has been introduced in the tender document for obtaining item wise rate for Mould Room accessories,

### Form 8(e): Item wise rate for Mould Room accessories

Item	Qty	Rate in USD	Total in USD
<b>1. Vac. Lock System - Nylon re-enforced blue urethane materials with one suitable vacuum pump for the system (complete set).</b>			
Breast & Thorax	6		
Hip & Pelvic	6		
Whole Body	6		
<b>2. Electron block cutter system with accessories</b>	2 sets		
<b>3. Various sizes holders to accommodate electron cut out of available electron applicators, cadmium free low melting alloy</b>	100 pcs		
<b>4. Immobilization Devices (Following Mould Room equipments are to be provided)</b> (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)			
Carbon fibre breast board with biaxial arm support for 2 sets versatile set up options and abdominal board CT imaging with 80 cm aperture	4 nos.		
Hip-pelvis board for pelvis & lower abdomen region	4 nos.		
Carbon fibre Head & Neck base plate and Head rests with low & regular correction of standard make A to F	4 complete sets		
Carbon fibre tilting Head & Neck base plate	2 sets		
Carbon fibre prone head holder with immobilization facility	2 sets		
Tilting/ Pituitary base plate for head with immobilization facility	2 nos.		
Prone breast board	2 nos.		
Blue cushion Thorax Abdomen- 0 wedge	4 nos.		
Foot rests & knee rests	4 sets		
Breast callipers (digital)	4 sets		
Multipurpose support cushions of various shapes	4 sets		
Immobilization straps for various sites	4 sets		
Digital water bath for thermoplastic precuts	2 no.		
Heat gun	2 no.		

Gel Bolus sheets 40 x 40 cm of thickness 0.5, 1, 1.5 and 3 cm	15 each		
Styrofoam cutter for photons	1 no.		
Styrofoam cutter for electron	1 no.		
Alloy melter	1 no.		
Low/medium melt alloy	50 kg		
Styrofoam blocks 12"x12"x3"	1 set		
Styrofoam blocks 12"x12"x1"	1 set		
Body calliper	2 nos.		
Curved stainless steel caliper	2 nos.		
Tissue compensator	2 sets		
Rectal marker	2 nos.		
CT markers (2mm dia)	500 nos.		
MRI markers	200 nos.		
Shoulder traction device for shoulder depression	4 nos.		
Testicles shields (clamps)	2 sets		
<b>5. Customised Thermoplastic Immobilization precuts</b>			
Head & neck	300 pcs		
Head	150 pcs		
Pelvis (supine)	150 pcs		
Pelvis (prone)	100 pcs		
Perspex sheets with adjustable stand arrangement for beam filtering for Total skin Electron Beam Therapy and Whole body Irradiation.	1 of each		
Tattoo ink	10 bottles		
Thorax Abdomen wedge 5 degree	4 nos.		
Thorax Abdomen- Arm rest – low	4 nos.		
Knee & leg positioning cushion- low	4 nos.		
Knee & leg positioning cushion- Base plate extension	4 nos.		
Grip pole- Complete system	4 nos.		
Side Panels for Vacuum cushions (set of 4)	4 nos.		
Leg separator Low	4 nos.		
Block 20mm in Reg Density	4 nos.		
Wedge 9 Angle in Reg Density	4 nos.		
Block 20mm in Carbon Fiber	4 nos.		
Wedge 9 Angle in Carbon Fiber	4 nos.		
Up gradation kit for SBRT consisting of Indexed knee support, Indexed foot support, Pressure belt with manual pump, indexable knee & foot support and two pin Index bar	1 set		
CIVCO/MICROMEDIX trUpoint ARCH (or equivalent) Starter Kit Including Frame, Acrylic Base plate, Storage Base,	1 set		

1bx of SRS Thermoplastic, 10 Custom Head Supports Impression Putty, 12 Bite Cups, 12 Bite Trays and a Putty Dispenser			
<b>Total for 1 (one) set</b>			

**Note1:** The bidders should consider the above mentioned tables under **Amendment 17** and **Amendment 18** as the final quantity for the Dosimetry and Mould room Accessories

**Note2:** The bidders should upload the filled in format 8(d) and 8(e) after converting it into pdf and merging with pdf of any one / two of the forms 8(a), 8(b) and 8(c) in any of the spaces assigned as 8(a), 8(b) and 8(c) in the etender portal

## **Amendment 19:**

**Format 8(a)** at page 118 has been modified. The modified format has been given below,

*Form 8(a): PRICE SCHEDULE FOR GOODS TO BE IMPORTED FROM ABROAD*

1	2	3	4	5	6
Sl.	Brief Description of Goods	Country of Origin	Quantity (Nos.)	Price per unit (in USD)	Total price (in USD)
				<b>Unit Price on CIP (Kolkata)</b> [i.e. value of the goods including all charges for export, carriage, insurance during loading, unloading and transportation, loading and unloading at port of export and import] + <b>all other charges for unit</b> (i.e. charges for local transportation and storage, Extended Insurance, installation, commissioning, supervision, demonstration and training) The unit price is excluding the cost of Dosimetry & QA Equipments and Mould Room accessories [ To be fed in the designated cell under Rate in the BOQ]	[(Quantity at 4) x (Price per unit at 5) ]
1	High-End High Energy LINAC		2		
2	High-End High Energy LINAC(with 15 MV photon Energy Trimmed off)		1		
3	High Energy LINAC		3		

Total Tender price in USD: \_\_\_\_\_

In words: \_\_\_\_\_

**Note: -**

1. If there is a discrepancy between the unit price and total price, the unit price shall prevail.
2. The charges for Annual CMC after warranty shall be quoted separately.
3. The Bidder will be fully responsible for the safe arrival of the goods at the named port/ airport of entry in good condition as per terms of CIP as per INCOTERMS.

Signature of Bidder\_\_\_\_\_

Name\_\_\_\_\_

Business Address\_\_\_\_\_

Place: \_\_\_\_\_

Signature of Bidder\_\_\_\_\_

Date: \_\_\_\_\_

Seal of the Bidder\_\_\_\_\_