Amendment No. 7

Date: 09.05.2014

Subject: Amendment no.7 to the Tender Enquiry Document

Ref: (i) Tender Enquiry No.: HLL/PCD/PMSSY/AIIMS-II/11/13-14 dated 19.12.2013.
(ii) Amendment No.1 dtd. 21.01.2014.
(iii) Amendment No.2 dtd. 10.02.2014.
(iv) Amendment No.3 dtd. 27.02.2014
(v) Amendment No.4 dtd. 14.03.2014
(vi) Amendment No. 5 dtd. 27.03.2014
(vii) Amendment No.6 dtd. 16.04.2014.

The due date for submission of bids is revised as follows:

Section I
Notice Inviting Tenders(NIT)

(1) For:-

S.No.	Name of Equipment	Department	Quantity per AIIMS	Total Quantity for 6 AIIMS	EMD (Rs.)
1	Platelet Agitator	Radiotherapy & Medical Oncology	1	6	84,000
2	(Cell seperator) Apheresis Machine	Radiotherapy & Medical Oncology	1	6	2,40,000
3	Hemo Analyzer	Radiotherapy & Medical Oncology	1	6	1,80,000
4	Dual energy linac with dosimetry	Radiotherapy & Medical Oncology	1	6	2,28,00,000
5	Low energy linac	Radiotherapy & Medical Oncology	1	6	84,00,000
6	HDR Brachytherapy	Radiotherapy & Medical Oncology	1	6	36,00,000
7	Multislice CT Simulator	Radiotherapy & Medical Oncology	1	6	72,00,000

Read as:

S.No.	Name of Equipment	Department	Quantity per AIIMS	Total Quantity for 6 AIIMS	EMD
1	Platelet Agitator	Medical Oncology	2	12	432,000
2	Apheresis Machine(Cell seperator)	Medical Oncology	2	12	432,000

S.No.	Name of Equipment	Department	Quantity per AIIMS	Total Quantity for 6 AIIMS	EMD
3	Hemo Analyser	Medical Oncology	2	12	264,000
4	Vein illumination device	Medical Oncology	2	12	120,000
5	Infusion Pumps	Medical Oncology	20	120	120,000
6	Laminar Flow Unit for chemotherapy	Medical Oncology	4	24	192,000
7	Flow Cytometer	Medical Oncology	1	6	540,000
8	ECG Machine	Medical Oncology	2	12	14,400
9	Cardiac Monitor	Medical Oncology	10	60	210,000
10	Chemotherapy Chair	Medical Oncology	20	120	720,000
11	Defibrillator	Medical Oncology	2	12	72,000
12	**Defined as SYSTEM A**				
	Advanced High Energy Linear Accelerator(LA) System	Radiation Oncology	1	6	3,48,00,000
	LOW ENERGY LINAC	Radiation Oncology	1	6	
	HDR BRACHYTHERAPY	Radiation Oncology	1	6	
13	**Defined as SYSTEM B**				
	CT Simulator System	Radiation Oncology	1	6	72,00,000

2) Added Pre bid meeting :-

Sl. No.	Description	Schedule
(i)	Pre bid meeting date & time	**15.05.2014 , 1100 hrs IST**

SECTION - II
GENERAL INSTRUCTIONS TO TENDERERS (GIT)

(1) For

11. Documents Comprising the Tender

Added Clause

11.1 A) xi)
The vendor must quote in two bids, i.e, technical bid and price bid in two separate sealed envelopes. Any technical bid with mention of price any where in the technical bid shall be rejected. The optional item/ items required by the institution if any, shall be procured from the selected L1 vendor only. The price for all the quoted optional items shall be valid for at least three years.

(2) For

13.4.2 For goods offered from abroad, the prices in the corresponding price schedule shall be entered separately in the following manner:

a) The price of goods quoted FOB/FCA port of shipment, as indicated in the List of Requirements and Price Schedule;
b) The amount of freight and insurance
c) the price of goods quoted CIP (name port of destination) in India as indicated in the List of Requirements, Price Schedule and Consignee List;
d) Deleted
e) the charges for Insurance (local transportation and storage) would be extended and borne by the Supplier from ware house to the consignee site for a period including 3 months beyond date of delivery. Other local costs and Incidental costs, as specified in the List of Requirements and Price Schedule;
f) the charges for Incidental Services, as in the List of Requirements and Price Schedule;
g) the prices of Turnkey (if any), as mentioned in List of Requirements, Technical Specification and Price Schedule; and
h) the price of annual CMC, as mentioned in List of Requirements, Technical Specification and Price Schedule.

Read As:

13.4.2 For goods offered from abroad, the prices in the corresponding price schedule shall be entered separately in the following manner:

a) The price of goods quoted FOB/FCA port of shipment, as indicated in the List of Requirements and Price Schedule;
b) The amount of freight and insurance
c) the price of goods quoted CIP (name port of destination) in India as indicated in the List of Requirements, Price Schedule and Consignee List;
d) Deleted
e) the charges for Insurance (local transportation and storage) would be extended and borne by the Supplier from ware house to the consignee site for a period including 3 months beyond date of delivery. Other local costs and Incidental costs, as specified in the List of Requirements and Price Schedule;
f) the charges for Incidental Services, as in the List of Requirements and Price Schedule;
g) the prices of Turnkey (if any), as mentioned in List of Requirements, Technical Specification and Price Schedule; and
h) the price of annual CMC, as mentioned in List of Requirements, Technical Specification and Price Schedule.
i) Applicable custom duty with & without CDEC and custom clearance charges if any, to be quoted in INR.

(3) For

13.5.5 Customs Duty:

The Purchaser will pay the Customs duty wherever applicable.

Read as:

13.5.5

The vendor will have to do the custom clearance and pay the custom duty and subsequently ask for reimbursement. Payment will be released against submission of actual duty paid challans.

SECTION - IV
GENERAL CONDITIONS OF CONTRACT (GCC)

(1) For

11. Insurance:

11.1 Unless otherwise instructed in the SCC, the supplier shall make arrangements for insuring the goods against loss or damage incidental to manufacture or acquisition, transportation, storage and delivery in the following manner:

i) in case of supply of domestic goods on Consignee site basis, the supplier shall be responsible till the entire stores contracted for arrival in good condition at destination. The transit risk in this respect shall be covered by the Supplier by getting the stores duly insured for an amount equal to 110% of the value of the goods from ware house to ware house (consignee site) on all risk basis . The insurance cover shall be obtained by the Supplier and should be valid till 3 months after the receipt of goods by the Consignee.

ii) in case of supply of the imported goods on CIP Named port of Destination Basis, the additional extended Insurance (local transportation and storage) would be borne by the Supplier from the port of entry to the consignee site for a period including 3 months beyond date of delivery for an amount equal to 110% of the overall expenditure to be incurred by the purchaser from ware house to ware house (consignee site) on all risk basis.

If the equipment is not commissioned and handed over to the consignee within 3 months, the insurance will have to be extended by the supplier at their cost till the successful installation, testing, commissioning and handing over of the goods to the consignee. In case the delay in the installation and commissioning is due to handing over of the site to the supplier by the consignee, such extensions of the insurance will still be done by the supplier, but the insurance extension charges at actuals will be reimbursed.

Read as:

11. Insurance:

11.1 Unless otherwise instructed in the SCC, the supplier shall make arrangements for insuring the goods against loss or damage incidental to manufacture or acquisition, transportation, storage and delivery in the following manner:

i) in case of supply of domestic goods on Consignee site basis, the supplier shall be responsible till the entire stores contracted for arrival in good condition at destination. The transit risk in this respect shall be covered by the Supplier by getting the stores duly insured for an amount equal to 110% of the value of the goods from ware house to ware house (consignee site) on all risk basis . The insurance cover shall be obtained by the Supplier and should be valid till 3 months after the receipt of goods by the Consignee.

(2) For

14. Distribution of Dispatch Documents for Clearance/Receipt of Goods

B) For goods imported from abroad

Within 24 hours of despatch, the supplier shall notify the purchaser, consignee, and others concerned if mentioned in the contract, the complete details of despatch and also supply the following documents to them by registered post / speed post (or as instructed in the contract). Any delay or demurrage occurred during the customs clearance on account of the non-availability of technical support/ clarifications /documents from the supplier shall be borne by the supplier:

(i) Four copies of supplier's invoice showing contract number, goods description, quantity, unit price and total amount;
(ii) Original and four copies of the negotiable clean, on-board Bill of Lading/Airway bill, marked freight pre paid and four copies of non-negotiable Bill of Lading/Airway bill;
(iii) Four Copies of packing list identifying contents of each package;
(iv) Insurance Certificate as per GCC Clause 11.
(v) Manufacturer's/Supplier's warranty certificate;
(vi) Inspection Certificate for the despatched equipments issued by recognized/ reputed agency like SGS, Lloyd, BEAUREU VERITAS, TUV prior to despatch
(vii) Manufacturer's own factory inspection report;
(viii) Certificate of origin
(ix) Port of Loading;
(x) Port of Discharge and
(xi) Expected date of arrival.

Read as:

14. Distribution of Dispatch Documents for Clearance/Receipt of Goods

B) For goods imported from abroad

Within 24 hours of despatch, the supplier shall notify the purchaser, consignee, and others concerned if mentioned in the contract, the complete details of despatch and also supply the following documents to them by registered post / speed post (or as instructed in the contract)

(i) Four copies of supplier's invoice showing contract number, goods description, quantity, unit price and total amount;
(ii) Original and four copies of the negotiable clean, on-board Bill of Lading/Airway bill, marked freight pre paid and four copies of non-negotiable Bill of Lading/Airway bill;
(iii) Four Copies of packing list identifying contents of each package;
(iv) Insurance Certificate as per GCC Clause 11.
(v) Manufacturer's/Supplier's warranty certificate;
(vi) Inspection Certificate for the despatched equipments issued by recognized/ reputed agency like SGS, Lloyd, BEAUREU VERITAS, TUV prior to despatch
(vii) Manufacturer's own factory inspection report;
(viii) Certificate of origin
(ix) Port of Loading;
(x) Port of Discharge and
(xi) Expected date of arrival.

The supplier is responsible to collect the CDEC from the consignee/AIIMS in time. Delay in getting CDEC cannot be made attributable to the purchaser.

(3) For GCC Clause 15.4 :-

Added Para:

All the optional items offered shall have similar warranty and CMC like the main item.

(4) For GCC Clause 15.7 :-

15.7 During Warranty period, the supplier is required to visit at each consignee's site at least once in 6 months commencing from the date of the installation for preventive maintenance of the goods

Read As:

15.7 During Warranty period, the supplier is required to visit at each consignee's site at least thrice in a year commencing from the date of the installation for preventive maintenance of the goods. The supplier must attend unlimited breakdown related activities.

During warranty and CMC period the uptime of the system shall be at least 95% calculated at all business hours of the institution. If downtime exceed 5% there shall be a penalty of Rs. 40000 per day for System A and Rs.5000 for System B. Necessary logbooks shall be provided by the supplier.

(5) For

21. Terms and Mode of Payment

21.1 B) Payment for Imported Goods:

Payment for foreign currency portion shall be made in the currency as specified in the contract in the following manner:

a) On Shipment:

Seventy Five (75)% of the net CIP price (CIP price less Indian Agency commission) of the goods shipped shall be paid through irrevocable, non-transferable Letter of Credit (LC) opened in favour of the supplier in a bank in his country and upon submission of documents specified hereunder:

(i) Four copies of supplier's invoice showing contract number, goods description, quantity, unit price and total amount;
(ii) Original and four copies of the negotiable clean, on-board Bill of Lading/ Airway bill, marked freight pre paid and four copies of non-negotiable Bill of Lading/Airway bill;
(iii) Four Copies of packing list identifying contents of each package;
(iv) Insurance Certificate as per GCC Clause 11 and documents also to be submitted for payment of LC confirming that dispatch documents has already been sent to all concerned as per the contract within 24 hours;
(v) Manufacturer's/Supplier's warranty certificate;
(vi) Inspection certificate issued by the nominated inspection agency, if applicable as per contract;
(vii) Manufacturer's own factory inspection report and
(viii) Certificate of origin by the chamber of commerce of the concerned country;
(ix) Inspection Certificate for the despatched equipments issued by recognized/ reputed agency like SGS, Lloyd, BEAURU VARITUS and TUV prior to despatch.

b) On Acceptance:

Balance payment of 25% of net CIP price of goods would be made against 'Final Acceptance Certificate' as per Section XVIII to be issued by the consignees through irrevocable, non-transferable Letter of Credit (LC) opened in favour of the Foreign Principal in a bank in his country, subject to recoveries, if any. FAC need to be issued by the designated consignee after installation, commissioning, testing and one to two weeks of successful trail run of the equipment.

c) Payment of Indigenous Goods :

Payment of indigenous goods will be paid as per the applicable payment terms i.e. 75% on delivery and 25% on acceptance. Delivery of the indigenous goods should be in line with the imported equipment.

d) Payment of Incidental Costs till consignee site & Incidental Services (including Installation & Commissioning, Supervision, Demonstration and Training) will be paid in Indian Rupees to the Indian Agent on proof of final installation, commission and acceptance of equipment by the consignee.

e) Payment of Indian Agency Commission:

Indian Agency commission will be paid to the manufacturer's agent in the local currency for an amount in Indian rupees indicated in the relevant Price Schedule (as per prevailing rate of exchange ruling on the date of Contract) and shall not be subject to further escalation / exchange variation.

Read as:

21. Terms and Mode of Payment

21.1 B) Payment for Imported Goods:

Payment for foreign currency portion shall be made in the currency as specified in the contract in the following manner:

a) On Delivery:

Seventy Five (75)% of the net CIP price (CIP price less Indian Agency commission) of the goods shipped shall be paid through irrevocable, non-transferable Letter of Credit (LC) opened in favour of the supplier in a bank in his country and upon submission of documents specified hereunder:

(i) Four copies of supplier's invoice showing contract number, goods description, quantity, unit price and total amount;
(ii) Original and four copies of the negotiable clean, on-board Bill of Lading/ Airway bill, marked freight pre paid and four copies of non-negotiable Bill of Lading/Airway bill;
(iii) Four Copies of packing list identifying contents of each package;
(iv) Insurance Certificate as per GCC Clause 11 and documents also to be submitted for payment of LC confirming that dispatch documents has already been sent to all concerned as per the contract within 24 hours;
(v) Manufacturer's/Supplier's warranty certificate;
(vi) Inspection certificate issued by the nominated inspection agency, if applicable as per contract;
(vii) Manufacturer's own factory inspection report and
(viii) Certificate of origin by the chamber of commerce of the concerned country;
(ix) Inspection Certificate for the despatched equipments issued by recognized/ reputed agency like SGS, Lloyd, BEAURU VARITUS and TUV prior to despatch.
(x) Consignee Receipt Certificate as per Section XVII in original issued by the authorized representative of the consignee;

b) On Acceptance:

Balance payment of 25% of net CIP price of goods would be made against 'Final Acceptance Certificate' as per Section XVIII to be issued by the consignees through irrevocable, non-transferable Letter of Credit (LC) opened in favour of the Foreign Principal in a bank in his country, subject to recoveries, if any. FAC need to be issued by the designated consignee after installation, commissioning, testing and one to two weeks of successful trail run of the equipment.

c) Payment of Indigenous Goods :

Payment of indigenous goods will be paid as per the applicable payment terms i.e. 75% on delivery and 25% on acceptance. Delivery of the indigenous goods should be in line with the imported equipment.

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e) Payment of Indian Agency Commission:

Indian Agency commission will be paid to the manufacturer's agent in the local currency for an amount in Indian rupees indicated in the relevant Price Schedule (as per prevailing rate of exchange ruling on the date of Contract) and shall not be subject to further escalation / exchange variation.

f) Payment of custom duty:- Custom Duty will be paid to the vendor as reimbursement on submission of actual duty paid challan. Custom duty will be released after safe delivery of the equipment at the consignee site and upon submission of consignee receipt certificate along with original duty challan.

(6) For GCC Clause 21.9

21.9 In case where the supplier is not in a position to submit its bill for the balance payment for want of receipted copies of Inspection Note from the consignee and the consignee has not complained about the non-receipt, shortage, or defects in the supplies made, balance amount will be paid by the paying authority without consignee's receipt certificate after three months from the date of the preceding part payment for the goods in question, subject to the following conditions:

(a) The supplier will make good any defect or deficiency that the consignee (s) may report within six months from the date of despatch of goods.
(b) Delay in supplies, if any, has been regularized.
(c) The contract price where it is subject to variation has been finalized.
(d) The supplier furnishes the following undertakings:

"I/We, _____ certify that I/We have not received back the Inspection Note duly receipted by the consignee or any communication from the purchaser or the consignee about non-receipt, shortage or defects in the goods supplied. I/We _____ agree to make good any defect or deficiency that the consignee may report within three months from the date of receipt of this balance payment.

Read as:

21.9 In case where the supplier is not in a position to submit its bill for the balance payment for want of receipted copies of Inspection Note from the consignee and the consignee has not complained about the non-receipt, shortage, or defects in the supplies made, balance amount will be paid by the paying authority without consignee's receipt certificate after

three months from the date of the preceding part payment for the goods in question, subject to the following conditions:

(a) The supplier will make good any defect or deficiency that the consignee (s) may report within six months from the date of despatch of goods.
(b) Delay in supplies, if any, has been regularized.
(c) The contract price where it is subject to variation has been finalized.

SECTION - VI
LIST OF REQUIREMENTS

(1) For :

Part I

S.No.	Name of Equipment	Department	Quantity per AIIMS	Total Quantity for 6 AIIMS	Warranty required	CMC required
1	Platelet Agitator	Radiotherapy & Medical Oncology	1	6	5 years	yes
2	(Cell seperator) Apheresis Machine	Radiotherapy & Medical Oncology	1	6	5 years	yes
3	Hemo Analyzer	Radiotherapy & Medical Oncology	1	6	5 years	yes
4	Dual energy linac with dosimetry	Radiotherapy & Medical Oncology	1	6	5 years	yes
5	Low energy linac	Radiotherapy & Medical Oncology	1	6	5 years	yes
6	HDR brachytherapy	Radiotherapy & Medical Oncology	1	6	5 years	yes
7	Multislice CT simulator	Radiotherapy & Medical Oncology	1	6	5 years	yes

Read as:

S.No.	Name of Equipment	Department	Quantity per AIIMS	Total Quantity for 6 AIIMS	Warranty required	CMC required
1	Platelet Agitator	Medical Oncology	2	12	5 Years	Yes
2	Apheresis Machine(Cell seperator)	Medical Oncology	2	12	5 Years	Yes
3	Hemo Analyser	Medical Oncology	2	12	5 Years	Yes
4	Vein illumination device	Medical Oncology	2	12	5 Years	Yes
5	Infusion Pumps	Medical Oncology	20	120	5 Years	Yes
6	Laminar Flow Unit for chemotherapy	Medical Oncology	4	24	5 Years	Yes
7	Flow Cytometer	Medical Oncology	1	6	5 Years	Yes

S.No.	Name of Equipment	Department	Quantity per AIIMS	Total Quantity for 6 AIIMS	Warranty required	CMC required
8	ECG Machine	Medical Oncology	2	12	5 Years	Yes
9	Cardiac Monitor	Medical Oncology	10	60	5 Years	Yes
10	Chemotherapy Chair	Medical Oncology	20	120	5 Years	Yes
11	Defibrillator	Medical Oncology	2	12	5 Years	Yes
12	**Defined as SYSTEM A**					
	Advanced High Energy Linear Accelerator(LA) System	Radiation Oncology	1	6	5 Years	Yes
	LOW ENERGY LINAC	Radiation Oncology	1	6	5 Years	Yes
	HDR BRACHYTHERAPY	Radiation Oncology	1	6	5 Years	Yes
13	**Defined as SYSTEM B**					
	CT Simulator System	Radiation Oncology	1	6	5 Years	Yes

Part VI:

Required Terms of Delivery and Destination.

(1) For:-

b) For Imported goods directly from abroad:

The foreign tenderers are required to quote their rates on CIP Named Port of Destination Basis giving breakup of the price as per the Proforma prescribed in the Price Schedule. Purchaser will place the order on CIP Named Port of Destination basis.

The shipping arrangements shall be made in accordance with the instruction of Ministry of Shipping & Transport, New Delhi, India as detailed in Annexure 1 at Section XIX.

Insurance (local transportation and storage) would be extended and borne by the Supplier from ware house to the consignee site for a period including 3 months beyond date of delivery.

Read as:

b) For Imported goods directly from abroad:

At Consignee Site(s)

The shipping arrangements shall be made in accordance with the instruction of Ministry of Shipping & Transport, New Delhi, India as detailed in Annexure 1 at Section XIX.

Insurance (local transportation and storage) would be extended and borne by the Supplier from ware house to the consignee site for a period including 3 months beyond date of delivery.

Section – VII
Technical Specifications

General points regarding technical specifications:

Added Para:

General points :-

1. It will be the responsibility of the principal vendor/ supplier of system A to coordinate with the regulatory authorities to ensure statutory clearances of all the systems. The necessary papers will be however given to the firm on request by the user.

2. An institution is expected to have full HIS and PACS. This should be kept in mind for integrating the imaging, Oncology and all allied branches.

3. It is the responsibility of the principal vendor to coordinate with the other vendors and ensure that the integration/networking (including Hardware& Software etc) of all the systems are seamlessly and successfully carried out and maintained for at least 10 years.

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.

5. The supplier of all systems shall bear all the cost of accessories and consumables required for complete installation and demonstration of equipment.

6. 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.

7. The supplier of all equipments including System A and System B shall bear all responsibilities and expenditures relating to insurance, transportation, custom clearance, loading, unloading of the equipment till handing over the machine to the hospital authority in complete working condition and commissioning (First Patient treatment).

8. Any item/items which is/are required for efficient and faultless running of all the functions and features of the tendered systems as per AERB requirements(wherever applicable) for at least 10 years, but not specifically mentioned din the specifications shall be supplied by selected vendor of the particular system with any additional cost.

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 AIIMS 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. The list of work (price) shall be compiled by the principal vendor in consultation with the user. The supplier of each of the systems shall coordinate with each other and the user such that their system arrives at the site only after the site is ready to accept the system and the **machines do not lie idle.**

Turnkey:-

Added Para

Principal Vendor (Supplier of System A) will be responsible for quoting for turnkey for both the systems even though the System B is not supplied by them. Principal vendor must inspect the site for both the systems and quote for the necessary turnkey requirements including civil, electrical, air-conditioning and networking/interface. This will include required hardware, software and labour.

Finishing, furnishing and interiors shall be done as per the user requirement by vendor supplying System A, conforming to the best industry standards. Layout and BOQ's shall accordingly be prepared and finalised by the principal vendor in consultation with the user.

The technical specifications are revised as follows:

1--Platelet Agitator-Two

- It should have provision to store about 96 platelet bags or 36 Apheresis bags or bags of different sizes.
- It should have a clear view single pane glass roll out door which should roll inside the chamber for opening of the incubator.
- Agitator should stop automatically once the door is opened.
- It should have micro-processed controlled LCD display, temperature graph display and graphical display of agitation speed.
- It should have stainless steel rtd sensor probes.
- It should have provision for 4"day inkless chart recorder with battery backup for continues operation during power failure.
- It should be able to maintain a temperature of 22 degrees.
- It should have gentle side to side motion (1 ½ "38 mm) with 65 ±5 strokes per minute
- It should have drawers with holes for complete air circulation across both surfaces of platelet bags

2-- Apheresis Machine (Cell Separator) – 2 nos

- Weight- Quote all models
- Physical dimensions Height, Height with mobility enhancements, Width, Depth: Please specify

- Ambient operating temperature 18° C to 27.5°C (64° F to 81° F) to maintain maximum blood temperature below 42° C (107° F)rpm: 2,400 Minimum blood flow: 25 mL/min
- Ambient operating humidity 0% to 80% RH, noncondensing
- Storage temperature -18° C to 60° C (0° F to 140° F)
- Fluid spillage A spillage over the top does not render the unit unsafe
- Line voltage 100 ±10% volts A.C., 47–63 Hz ,115 ±10% volts A.C., 47–63 Hz,220 ±10% volts A.C., 47–63 Hz, 240 ±10% volts A.C., 47–63 Hz
- Centrifuge speed range 400 to 2,400 rpm,Centrifuge speed accuracy ±5% ,Maximum g-force generated in channel Dual-stage channel: 910 g, Single-stage channel: 930 g
- Centrifuge Pressure Sensor, Operating range 400 to 1,200 mm Hg, Alarm pressure 1,000 mm Hg
- Disposable Tubing Sets
- It should have anticoagulant level detector
- It should have collect concentration monitor
- Disposable Tubing Sets

3--Hemo Analyzer- 2 nos

WBC count/RBC count	0–400/0–8.0
• Hemoglobin/platelet	0–25/0–3,000
• MCV (fL) or Hct (%)	—
Precision:	
• WBC count/RBC count	≤1.7 percent/≤0.8 percent
• Hemoglobin/platelet	≤0.8 percent/≤3.3 percent
• MCV or Hct	≤0.8 percent (MCV)
Accuracy of automated differential compared with manual differential (per CLSI H-20A2)	lymph% = ±3.0%, neut% = ±2.0%, mono% = ±3.0%, eo = ±1.0%, baso% = ±1.0%
Interfering substances:	
• WBC	unusual RBC abnormalities that resist lysing, NRI fragmented WBC, unlysed particle >35 fL, giant PLT, P clumps
• RBC	very high WBC, high concentration large PI

	autoagglutinins
• MCV or Hct	MCV and Hct: very high WBC, high concentration la PLT, autoagglutinins
• Platelet	very small RBCs and WBC fragments may interfere
• Hemoglobin	very high WBC, severe lipemia, heparin, rare lyse-resis RBCs
Interfering substances: Differential	high triglycerides may affect lysing
Maximum CBCs per hour/Maximum CBCs and differentials per hour	110/110
Minimum specimen volume open/Closed/Sample dead volume closed	200 µL/300 µL, 550 µL with slidemaker/1.0 mL
Maximum archived data accessible when system online	20,000 samples
No. specimens for which numeric results saved in memory at once	20,000 samples
No. specimens for which histo/cytogram results saved in memory at once	20,000 samples
Scattergram display:	cell-specific color
Histogram display:	with thresholds

4. Vein illumination device- Two

Technical Specifications

Control Unit Dimensions (max.) 15cm / 6"
Illuminator Dimensions (max.) 7 cm/ 3"
Control Unit Weight (g / oz.) up to 400g
Cord / Illuminator Weight (g / oz.) up to 40 g
Total Weight (g / oz.) up to 500 g
Dimming Ability Nine gradients (red and yellow)
Safety Features Timed dimmer and cut-off
Energy Source to be integrated
Technical Specification

E. Infusion Pumps- 20 nos

1. Should be operated on drip rate Peristaltic finger pump method.

2. Should compatible with most of the IV set (macro/micro drip sets).

3. Should have the following flow rates.

4. IV Set ml/hr drops/min

15 drops/ml 3~450ml/hr 1~100drops/min
20drops/ml 3~450ml/hr 1~100drops/min
60drops/ml 1~100ml/hr 1~100drops/min

5. Should have a flow rate accuracy of ±10% and drip rate accuracy of ±2%.

6. Should have a volume infused display from 0 to 999.9ml.

7. Should have a purge and KVO facility.

8. Should have an audible and visual alarm for occlusion pressure, air alarm, door open, empty, low battery.

9. Should have a LCD display with backlight and graphical display of infusion Should have a minimum 2hr battery back up at highest delivery rate.

10. Should work with input 200 to 240Vac 50 Hz supply.

11. Should have safety certificate from a competent authority CE / FDA (US) / STQC CB certificate / STQC S certificate or valid detailed electrical and functional safety test report from ERTL. Copy of the certificate / test report shall be produced along with the technical

F. Laminar Flow Unit for Chemotherapy- 4 nos

1. Overall Dimensions: About- 37"W x 34" D x 49 ½" H
2. Work Area Dimensions: About 34" W x 22" D x 34" H
3. Outer cabinet and work surface should be stainless steel with 4 pharmaceutical grade finish.
4. High capacity motor/blower system with speed control to extend HEPA filter life.
5. Top mounted pre-filters should be easily changeable.

6. 16 gauge stainless steel work deck should be 36" from the floor and reinforced to support 300+ pounds
7. HEPA filter with full width and height (36"), ensuring unidirectional airflow and should be easily changeable from both sides.
8. Top mounted fluorescent lighting should be isolated from the clean environment.
9. IV hanging bar with 12 hooks in work area.
10. Separate lighted power ON/OFF indicator switches for blower and lighting.
11. Electrical is 220v/50-60 Hz
12. Ten foot power cord with molded grounded plug.

WARRANTY AND CAMC: THE TENDERERS MUST QUOTE FOR <u>FIVE YEARS</u> COMPREHENSIVE WARRANTY (INCLUDING ALL SPARES AND LABOUR) FROM THE DATE OF COMPLETION OF THE SATISFACTORY INSTALLATION. THE WARRANTY CAHRGES SHALL NOT BE QUOTED SEPERATELY OTHERWISE THE OFFER SHALL BE SUMMARILY REJECTED.

THE BIDDERS MUST SUBMIT THEIR QUOTE ALSO (RATES) FOR SUBSEQUENT <u>FIVE YEARS</u> COMPREHENSIVE AMC (INCLUDING ALL SPARES AND LABOR) IN THEIR PRICE BID, FAILURE TO COMPLY THIS CONDITION WILL ENTAIL THE REJECTION OF THE BIDS.

~~6~~.FLOW CYTOMETER-One

One bench-top flow cytometer analyser is required with following technical specifications:

1. Equipped with solid state 405 nm laser (40mW or more), solid state 488 nm laser (20mW or more) and solid state 633 - 642 nm laser (50mW or more)
2. Provision for turning individual lasers on / off independently through software
3. Must perform 9 or more fluorescence parameters along with forward and side scatter simultaneously
4. The acquisition speed and analysis rate of the analyzer should be not less than 60,000 events / sec, regardless of the number of lasers or fluorescence parameters being used
5. Maximum analysis capability in terms of number of events should be stated
6. Should have high quality quartz cuvette (flow cell)
7. Optical filters should be easily changeable by users
8. Detection sensitivity in the range of MESF < 100.
9. Fully automated/electronically controlled fluidics with flow rate that is capable of continuous adjustment to meet different applications
10. Capable of achieving high precision sample flow rate of 140 µl per minute or more
11. Must have online and offline compensation capability between all fluorescence channels manually and through auto-compensation.
12. Software: PC controlled Windows-based cytometry software to operate, display and control instrument processes.

13 Hardware with following configuration or better. Intel® Pentium® Dual-core Processor, Memory 4 GB, Graphics Card, Hard Drive 160GB, Network Adapter card Ethernet , DVD with Read-Write Devices and USB Media Card Reader, 24" LCD Monitor

14 One laptop of standard make must be quoted for offline analysis with instrument compatible software.

15. Additional flow cytometry analysis software package (3 licenses) should be provided that would be capable of analyzing multi-dimensional data and multiple bivariate plots simultaneously. The software should have scroll free statistics viewing on per-plot basis with the option of on plot gates creation, formatting, annotating and biexponential transformation. It should also be capable of analyzing data from other flow cytometry platforms.

16. The flow cytometer should be a standard and preconfigured system rather than special order or custom designed

17. Instrument Installation requirements including power supply, power backup, flow cytometer space requirement (D x W x H) must be clearly indicated in the offer. Analyser footprint should not be larger than 36X36 inches (depth & width).

18. The tenderer must quote for 5 years comprehensive warranty (including all spares/accessories and labour) from the date of completion of satisfactory installation. The warranty charges shall not be quoted separately, otherwise the offer shall be summarily rejected. Also, the bidders are requested to submit their quote/rates for subsequent 5-year comprehensive AMC (including all spares/accessories & labour). Failure to comply with this condition will entail the rejection of the bid. The price comparison shall be made taking into account on basic price and post -warranty CMC.

Note: Software upgradation if any, within 5 years of comprehensive warranty should be supplied free of cost

9. Purchase of ECG Machine – 2 Nos.

Technical Specification:

SPECIFICATIONS FOR ECG MACHINE

1. ECG Machine should have simultaneous 12 lead resting ECG acquisition with measurement with biphasic defibrillator technology.

2. Unit should be light weight.

1. Should have 3 channels recording with LCD display.
2. ECG sweep speed- 25 mm/s , 50 mm/s
3. Should have Internal thermal printer
4. Should have facility to enter patient data entry 9name, age, height, weight, BP)
5. Machine should be supplied with 12 lead patient cable and all standard accessories.

WARRANTY : THE TENDERERS MUST QUOTE FOR TWO YEARS COMPREHENSIVE WARRANTY (INCLUDING ALL SPARES AND LABOUR) FROM THE DATE OF COMPLETION OF THE SATISFACTORY INSTALLATION. THE WARRANTY CAHRGES SHALL NOT BE QUOTED SEPERATELY OTHERWISE THE OFFER SHALL BE SUMMARILY REJECTED.

THE BIDDERS MUST SUBMIT THEIR QUOTE ALSO (RATES) FOR SUBSEQUENT THREE YEARS COMPREHENSIVE AMC (INCLUDING ALL SPARES AND LABOR) IN THEIR PRICE BID, FAILURE TO COMPLY THIS CONDITION WILL ENTAIL THE REJECTION OF THE BIDS.

9.Technical Specification-Cardiac Monitor-Ten

1. **Cardiac Monitors with Saturation**

1Should have high resolution TFT/LCD colour display monitor of atleast 8 inches.
2 Should have display for SpO2, ECG waveform
3 Should have 3 lead ECG monitoring with lethal arrhythmia analyser.
4 Should have easy menu driven operation.
5 Should have audio visual alarm for high and low heart rate.
6 Should provide real time view.
7 Monitor should have in built Lithium-ion type battery for 4 Hrs continuous operation in case of mains failure.
8 Should operate on mains 230V, 50Hz and on rechargeable battery
9 Should provide following accessories
- Reusable ECG cable set – 2
- Reusable adult and paediatric SpO2 finger probe – 1 each
- Jelly - 1 bottle

10 Equipment performance should not be affected by electromagnetic radiated or conducted through power lines from another device.
11Should have safety certificate from a competent authority CE / FDA (US) / STQC CB certificate / STQC S certificate or valid detailed electrical and functional safety test report from ERTL. Copy of the certificate / test report shall be produced along with the technical bid.
12 Additional Offer
NIBP Monitor at Free of Cost

10.Chemotherapy chair-Twenty

1. Automatic adjustment of armrest to adjust seat with support comfortable vein puncture.
2. Wedge shaped armrest to provide better blood flow from the donor and donor comfort. Adjustable swivel able and lift up.
3. Remote control adjustments for adjustment of height and comfortable sitting position.
4. 2 motors controlled with electronic remote for lower/back and height adjustment.
5. Lifting capacity of 175kg. Twin belt system. Length of couch 214cm. Arm rest length 55 cn, width 14.5cn,
6. Only one button to reach shock position: head low in case of donor reaction. Remote controlled
7. Motor protection aginst water.
8. Sealed ribs for air circulation
9. Central locking with locking lever.

10 Waterproofed seat, imitation leather with rounded border easy toclean 8 cm thick padding mattress. Washable.

K. Defibrillator- Two

1. Semi-automatic external defibrillator
2. **ENERGY** 50 Joules-150 Joules
(nominal into 50 ohm load)
3. **CHARGE TIME** DBP-2800: Less than 6 seconds, DBP-1400: Less than 9 seconds

RADIATION ONCOLOGY

SYSTEM – A

I—SPECIFICATIONS FOR ADVANCED HIGH ENERGY LINEAR ACCELERATOR (LA) SYSTEM

1. High Energy Medical linear Accelerator shall have futuristic Advanced platform and shall have minimum photons of 6 and 15MV & any five electron beams from 4 to 20 MeV range. The Linac shall deliver IMRT, VMAT/RAPID ARC, 3D CBCT, and gated Delivery as package and shall be upgradable to 4D kV/Cone beam CT (IGRT), advanced 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. The main equipment and major features shall have AERB type approval/NOC and shall have FDA or CE approval.

2 BASIC EQUIPMENT

a. The accelerator shall be capable of producing two clinically useful photon beams with energies of 6 MV for the low energy and 15 MV for the high energy. The minimum characteristics of each energy for a 10x10 cm field at 100 cm TSD should be as follows :-

Nominal Energy (MV)	D max (cm)	%Depth Dose at 10 cm depth (10x10 field)
6	1.5 ± 0.2	67.1 ± 1.5
15	3.0 ± 0.2	76.5 ± 2.0

For all the energies quoted, specify the above characteristics. A difference of ±2% in the depth dose data from the IEC published values.

b. **Dose Rate Beam Stability**

1. The X-ray dose rate shall be variable in steps and the X-ray dose rate shall be variable 100-600 MU/minute or more for both 6 and 15 MV X-ray energies. Buyer may not accept any optional price for higher dose rates for flat photons.

Linac Dosimetry Control System

The LINAC shall have built in dosimetry chambers with two separate sealed or unsealed chambers. Parameters of dosimetry system shall be as follows :-

Precision ± 1% or 1 MU

Linearity ± 1% or 1 MU

Reproducibility ± 2 % or 1 MU

Dose Rate Dependence

c. **Photon Beam Energy Stability:**

a. The quality index of a photon beam should not vary with time by more than ±1% or comply AERB requirements.

b. The bend magnet system shall be provided with energy defining apertures such that the nominal energy of the electrons beam existing from the bend magnet shall be within ± 3% of the nominal energy selected at control console for both photons and electrons.

d **RF Source**: Magnetron / Klystron, RF Driver, Thyretron (RF) and RF coupler combination with 5 years full replacement warranty on full RF chain

e **Waveguide Type**: Standing / Travelling wave

The Wave guide shall have at least 15 years full replacement warranty

f. **Electron Gun**: Sealed/Unsealed **and shall have** at least 5 years full replacement warranty

g. **Treatment Modes** Normal - TSD / TAD

Rotation - CW / CCW

ARC - CW / CCW

Dose rate - MU/degree

3. **Field size specifications**

The field size is defined as the distance along the radial and transverse axes between the points of 50% density on an x-ray film taken at 100 cm TSD with minimum buildup. The digital display, light field size and mechanical display should be accurate to within ± 1 mm for field sizes _ 10 x 10 cm2 and _ 2 mm for field sizes > 10x10cm2 or comply AERB requirements.

a. The accelerator shall provide a continuously variable rectangular,

Unclipped field size from 1 x 1 cm2 to 35 x 35 cm2 at 100 cm SSD. The

Maximum clipped field size should be equal or exceed 40x40 cm2 at 100 cm SSD. Clipped corners are unacceptable for field smaller than 35x35 cm2.

b. A **detachable block holder** should be provided to accommodate 2 trays. The size of the blocking trays should be at least 5 cm larger than the maximum field size at the lower position. Specify location and size of blocking trays.

4 A complete set of pre-shaped beam shielding blocks shall be provided.

5. **Radiation Field Penumbra**

The width between the 20% and the 80% isodose lines measured for 10x10 cm at depth of 10 cm at 100 cm SSD should not be more than 7 mm.

6. Congruence between optical & Radiation fields:

The congruence between optical and radiation fields for all photon energies for 5x5 cm2, 10x10 cm2, 30x30 cm2 or for a field of maximum dimension for 0 deg, 90 deg, 180 deg and 270 deg gantry angles with SSD=100 cm at the depth of reference plane should be as per FDA /AERB recommendation.

7 **Beam Profile**

Field Flatness Specification Variation of x-ray intensity relative to the central axis shall be _ ± 3% at 100 cm SSD and 10 cm depth over the central 80% of the field for the longitudinal, transverse and diagonal axes of all field sizes from 10x10 cm to 40x40 cm. Stability of the flatness with gantry rotation at 0 deg. 90 deg. 180 deg. and 270 deg. at 10 cm depth on x, y and diagonal axis for all field sizes from 10x10 cm to maximum field size should not be more than ± 3% (As per IEC guideline).The flatness criteria applied to beam profile at D max should show peripheral horns not exceeding 105% of the central axis dose.

8. **Field Symmetry Specifications:**

The maximum percent difference of average doses shall not exceed ± 2% for the longitudinal and transverse halves of the field at 100 cm TSD and 10 cm depth at gantry angles of 0, 90,180 and 270 degrees. Field sizes shall be specified as 10x10 and 40x40 cm2. Average dose is defined as the arithmetic average of minimum and maximum doses within the central 80% of the field for both axes.

9. **X-ray Contamination**

The X-ray/ electron/ Neutrons leakage and contaminations should comply the AERB guidelines. All safety systems including head leakage should be as per IEC/AERB guidelines.

The x-ray contamination of the electron beam shall be less than 5% of the maximum dose for all energies specified previously.

a. X-ray absorbed dose due to leakage radiation (excluding neutrons) outside useful beam but inside a plane circular area of radius 2 m centered around and perpendicular to central axis at normal treatment distance As per AERB.
b. The electron contamination should not be more than 1%.
c) Radiation leakage limits shall be within appropriate regulatory agency guidelines. as follows :-

1. Photon leakage. The photon leakage rate at any point one meter from the target outside the cone defined by the primary x-ray collimator shall be less than 0.1% of the absorbed dose at the isocenter.

2. Collimator transmission. The movable collimators shall not permit transmission of radiation exceeding 0.5 % of the central axis dose at Dmax measured in air for both photon energies.

d. Neutron leakage. The neutron leakage rate should not exceed 0.15% expressed in neutron dose equivalent (REM) when added to the photon leakage for a 10x10 cm field at the isocenter at any point one meter from the target when the jaws are closed or to comply AERB requirement.

10. **Electron Energy**: minimum 5 Beam energies between 4-18 MeV (more energies if available may be offered without any additional cost).

a) **Dose-Rate for electron energy**: Please specify the dose rates and higher dose rates for special treatments.

b) **Field Size**

The electron beam size is defined by the inside dimensions of the electron beam applicators projected geometrically to a plane surface at 100 cm SSD. At least 4 applicators with Minimum - 6 x 6 cm^2, Maximum – 20 x 20 cm^2 or more; there shall be an arc applicator provided for electron arc treatment.

A method to obtain irregular field shapes shall be provided.

It shall be possible to visualize both the field defining light and the optical distance indicator with an electron applicator in place.

c) **Beam Flatness (Electrons)** Variation of electron intensity relative to the central axis shall not exceed 5 % over within the central 80% of radial and transverse axes for photons field sizes 10 x 10 cm to 20x20 cm at 10 cm depth and satisfy local and Indian regulatory AERB requirements.

d) **Beam Symmetry**: - The maximum percent variation in the average electron intensity to the longitudinal and transverse halves of the electron field at D max for a 10x10 cm and 25x25 cm field at 100 cm SSD shall not exceed ± 2% at gantry angles of 0, 90,180, and 270 degrees. The average electron intensity is the average of the maximum and minimum points within the central 80% of the field for each of the axes.

11. **Other Specifications**

a) The target to axis distance should be 100 ± 0.2 cm or to comply AERB requirement.
b) The isocenter shall lie within a sphere of radius 1 mm or to comply AERB requirement.
c) The accelerator gantry shall be capable of rotation equal to or greater than 360 degrees with a variation of the mechanical and radiation isocenter during rotation of less than ± 1.0 mm throughout the entire rotation with variable gantry speed.
d) Digital scales indicating gantry angle position shall be provided both in then treatment room and at the control console. Accuracy of the scales shall be ± 0.5 degree.
e) The distance from the end of the lower collimator to the isocenter shall be ≥ 41 cm.
f) The bottom of the blocking tray should be greater than 30 cm from the isocenter.
g) The height of the isocenter above the finished floor shall be less than 130 cm.
h) Digital scales indicating collimator angle position shall be provided both in the treatment room and at the control console. Accuracy of the scales shall be ± 0.5 degree.
i) The Chiller system shall be the integral part of the equipment supplied. Local chillers shall not be accepted.
j) Imported voltage stabilizer shall be provided for power spike protection.
k) In addition to meeting above specifications for radiation leakage, the LINAC should also meet all the mandatory safety and radiation leakage regulations or as specified by AERB.
l) Focal Spot size should be 1-2mm (smallest is preferable)

12. **Photon Arc Therapy** Bi-directional arc therapy should be included with Automatic calculation of Dose per Degree based on the Dose Rate selected and the Arc angle set.

13. **Beam characteristics:** for electrons and Photons shall satisfy local and Indian regulatory authority which is mandatory.

15. **Gantry**

a) Rotation ±180° (360° total)
b) Read out - Digital and Mechanical
c) Accuracy dig-readout 0.5°
d) Control - Hand pendent and control-console
e) Target - Axis Distance. - 100 ± 2mm or better
f) ODI Range- 75 cm to 150 cm
g) ODI Accuracy + 0.1 cm
h) Gantry Rotation Isocentre less than or equal to 2 mm dia. Sphere please specify.

16. **Collimator**:
a) Rotation - ± 165° at mid position however full ± 180° rotation preferable
b) Control - Hand pendent and control- console
c) Readout accuracy - ± 0.5°
d) Collimator Rotation Isocentre 2 mm dia. Sphere

17. **Physical/Motorized/Dynamic/Virtual Wedge- Please specify.**

18. **Asymmetric Collimators**
a) X & Y both Asymmetrical
b) travel rangcs- X & Y : Please Specify

19. **I. Multi-leaf collimator (MLC)**
a) No. Of Physical Leaves- 40 pairs or more (80 leaves with at least 2.0 cm/sec speed including the leaf guide speed but excluding carrier speed) MLC with combination of 10 mm leaves, which shall provide maximum of 40x40cm2 field size.
b) Independent drives for each leaves
c) Leaf width at isocentre 10 mm for lateral leaves in 80 leaf combination shall be Capable of performing conformal therapy procedures.
d) Work Station shall have SW and HW, the minimum shall be Pentium 4, 1 GB memory or more, 5 USB port, UPS etc.
e) Integration (full Networking), conventional Simulator, CT scanner, CT Simulator, MRI & RFA should be done via Planning System.
f) 3D CRT, IMRT,VMAT/RAPID ARC, and 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, SRT & SBRT capability.
g) Leaf retracting position minimum 20cm
h) High over center travel of MLC leaves (>10 cm) for all treatments.
i) Leaf height minimum 9 cm for reduced peak transmission under 0.5%
j) Leaf material shall be tungsten alloy
k) Coincidence of light & x-ray field ±2mm
l) Penumbra shall be < 7mm for 10x10 field
m) Transmission within 0.5%
n) X ray leakage within 0.2%
o) Minimum leaf speed shall be 0cm/second
p) Maximum leaf (including each leaf guide excluding carriage) speed shall be 2.0 cm/second for 80 leaf combination.
q) Positional accuracy of the leaves during treatment 0.5mm
r) Inter-digitization of leaves shall be provided
s) Two nos. of treatment in-room monitors 19" TFT to be provided.

20. **Treatment Couch**:

a) Versatile extended range shall be supplied.
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°
c) Electrical & Mechanical Control in case of power failure
d) Control-Local and/or Remote
e) Shall have indexed carbon fibre table top

20. **Accessories:**

a) Front and back pointer – mechanical and/or laser
b) CCTV / Camera Two Nos One wide angle & one remote control with remote zoom & focus facility
c) Laser Alignment System – Green/Red colour (3 cross +1 line)
d) A patient communication system with 6 channels shall be supplied.
e) Interface mount to be provided for shadow trays.

21. **Portal Imaging & Accessories**

a) Portal imaging should be fully integrated with Accelerator
b) Should be able to take images at any Gantry angles with variable X-Y movements, Robotics Arm with remote control
c) Should have Digital technology with High Resolution 1024 x 768 pixels or more Imaging (Amorphous Silicon Flat Panel Based Technology)

22. a. KV/MV based 3D IGRT shall be provided and such system shall have FDA/CE 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 software's, with manual/automated DICOM, kV/MV IGRT QA tools.

b. Respiratory gated treatment delivery system/s which can be used in both CT scanner and Linear Accelerator shall be provided.

23. **TREATMENT PLANNING SYSTEM:**

The planning system shall have 2 calculation engines with planning capability for conventional, and arc electrons, conventional, wedge, 3D CRT/IMRT/VMAT/RAPID ARC, There shall be 3 separate (work station) contouring system with the ability to do virtual simulation, auto segmentation and auto fusion.

WORK STATION / SERVER- Latest hardware and soft ware and upgradable for next 10 years.

Hardware: Basic PC shall be a Dual Processor with first Processor with 2.60 GHz/20 MB Xeon 8C 1600 MHz and the second with 2.60 GHz/20 MB Xeon 8C 1600 MHz or higher. There shall be Graphics of 1.0 GB or higher with Memory 32GB (8x4GB) DDR3 or higher and there shall be two disk with 6Gb/s 300GB 15K rpm or higher.

There shall be 16X DVD +/- RW player and the PC comes with USB Keyboard Standard, USB Optical Scroll mouse, with 24" LCD Color Monitor or higher

- The system should have a fast multi-colour printer/plotter to print out various data and Isodose curves.

3D TELETHERAPY SOFTWARE FEATURES

Contouring:

Volume definition should be possible using Volume Segmentation using threshold, Free hand contour tracing, Contour editing, 3D anistrophic Margins etc.

Volume delineation should be possible with Free hand contour tracking or Advanced volume segmentation using threshold in 2D or 3D or with predefined shapes. Various contour editing tools to modify the contour at any plane should be possible.

It is desirable to have the facility to contour in Axial, Sagittal, Coronal or in any oblique planes.

It should be possible to do manual, semi-automated, fully automated contouring / segmentation in the images.

The software should have facility for automated uniform or non-uniform margins. For example it should be possible to expand the clinical target volume (CTV) three dimensions by same magnitude or by different magnitudes to define the planning target will be considered as not meeting the requirements.

It should be possible to copy one organ to another with margin; add margins on a single slice, a range of slices or all slices.

It should also be possible to interactively edit the contours with user choice of segments to reject or accept.

Interpolate algorithm should be available to provide interactive, shape based interpolation – i.e. after contouring only in selected slices, the algorithm should automatically interpolate the closely fitting contours in other slices.

Interpolated contours may be edited: accepted or rejected.

The DRR/BEV image should display the machine diagram to allow real-time checking of machine and patient geometry.

Auto-outlining with Non-Uniform Margins.

Facility to contour on coronal and sagittal and on any arbitrary planes.

Image Fusion Software

This should include automatic and interactive image registration and fusion of CT with MR/PET images for treatment planning.

This should include real time image reformatting and fully automated image alignment.

3D Fusion display with delineation of target in the fused image should be available.

Beam Placement & Definition

It should support extensive beam shapers (shielding blocks, etc.) and beam definition methods manual or automatic beam placement tool.

Tools for real time checking of machine geometry.

Beam shaping should be possible in multiple ways like automatic shielding block definition conforming to selected volume, definition as aperture or shielding, manual freehand definition, automatic collimator jaw or multileaf position definition etc.

DRR features

Interactive DRR calculation mode must be available Automatic window width/level selection for DRR.

DRR should be interactively updated when the isocenter position is modified should be possible to highlight or suppress different density regions in the DRR Printing of DRR images should be possible.

DRR presets should be user defined Macro function to save a series of frequently used steps should be available.

Specify DRR image enhancement tools to improve DRR image quality Reconstruction of DRRs should be real- time or sub-second Direct printing of DRR on laser film should be possible.

Real-time displays of DRR as beam parameters are changed.

It should be possible to transfer DRR and BEV images to EPID of Linear Accelerator.

Depth Control in oblique projections must be possible

Cross-hair display on DRR to provide scale information.

SUPPORT OF ASSYMMETRIC COLLIMATORS AND MULTILEAF COLLIMATORS (MLCs):

It should be possible to define this asymmetric collimator feature, where both the X- and Y-pairs of jaws are asymmetric. The software should allow multi-leaf collimator placement up to 60 pairs or more.

Isocenter management.

The software should support separate isocenters for multiple target volumes or general regions.

Marked and final isocenters should be reported and displayed in the Localization package for easy confirmation of a physical simulation session.

Hardcopy of the isocenter coordinates should be possible for record of the simulation session.

No limit on number of isocenters per target.

VOLUME RENDERING

3-D view and volume rendering capabilities

Post processing features like Volume Rendering, Real-time multi-axial volume reconstruction, 3D surface rendering, Color 3D should be available.

It should allow complete 3D volume to be defined including complex 3D volumes, user selectable multi-images views, Beams Eye View, DRR etc.

Dose Module should consist of two different types of calculation algorithm namely

Collapsed Cone Convolution/AAA convolution algorithm for photon beam dose calculation

It should be possible to define the absolute dose to a specified point for each beam or MUs or time (isotope base machines).

Possible to define wedge fraction for motorized wedge plans

Should have inhomogeneity and bolus correction

Should include various Dose Volume Histogram tools like

- Cumulative and differential histograms
- Comparison of requested Dose Volume Constraints versus achieved Dose Volume Histogram results

Volumes may be displayed in absolute or relative terms

Should be possible to Export Plans in RTP Connect format

Should include MonteCarlo dose calculation for Electrons module with possibility to have Calculation of electron beams of 4-30MeV from linear accelerators and support of Support for square, circular, and rectangular applicators

The vendor shall provide also Montecarlo photon based planning algorithm or its equivalent in calculation accuracy as module for IMRT, VMAT/RapidArc and dynamic conformal ARC.

- Offered VMAT/RAPID ARC Software should be compliant with multimodality, and flexible dynamic treatment planning environment.
- Offered VMAT/RAPID ARC capability including support for single arc, multiple arc techniques.

Offered VMAT/RAPID ARC module should be of assured accuracy

- Should be capable of delivering Complex plans by the Linac via optimal single, multiple or dual arcs with CW and CCW gantry motion to maximize treatment efficiency.
- Should be capable to generate superior plans while limiting leakage, scatter and integral dose to the OARs
- Seamless connection with compliant R&V systems
- Should be Capable to perform Single and multiple arc capable Non-coplanar arcs for support of stereotactic radiotherapy and SBRT
- Should be able to do Precision Dual Arc technique with back and forth gantry motion

Offered VMAT/RAPID ARC module Should be Easy to use

- Easy specification of Dose Volume Objectives
- Dose distribution and DVH updated on all views during optimization
- Graphical visualization of optimized plan Intuitive

Offered VMAT/RAPID ARC module can handle simultaneous leaf position , collimator, gantry speed and dose rate variation and shall have Dynamic conformal Arc software with MLC shaping based on view of the target while gantry in rotation for SBRT/SRT delivery

image Import / Export

System should be able to import and export Image, and volume in DICOM 3.0 standard along with all Radiotherapy specific image data.

DICOM RT Data import & Export:

Offered Software modules should be compatible to perform as below

- Export of ideal or reconstructed Fluence distributions and Fluence maps in DICOM RT format
- DICOM RT Plan export to various R&V and QA systems including (but not limited to):
- Oncology Information System connectivity

Connectivity :

The TPS should be of the latest & able to network with the like any vendor linac, Radiotherapy Simulator and diagnostic CT system etc.

Service Facilities:

Factory trained and AERB/BARC approved Service engineers / Application specialist should be available in India to look after the installation and maintenance of the systems.

FDA approval:

The 3D Treatment planning system should have FDA 510K approval.

24. **Oncology Information System complete with Networking**

Features shall include

a) Record & Verify System
b) Transfer of all parameters from existing CT Simulator/scanner, if DICOM is available to Treatment Planning System, and contouring station for Automatic contouring etc
c) Transfer of all parameters Treatment Planning System to the linear accelerator For Automatic treatment setup & delivery
d) Transfer of Fluoroscopy images from CT Simulator to Portal Imaging System for Comparison.
e) Transfer & Execution of MLC Position Parameters for normal treatment & IMRT treatment including step & shoot and Sliding Window (Dynamic), VMAT/RAPID ARC or future SRS/SRT techniques from Treatment Planning System

25. Dosimetry and QA

RADIATION THERAPY BEAM ANALYZER

Require a full-fledged three dimensional Water Phantom & Dosimetry System and therapy be analyser for performing Off-axis profiles, PDD, point dose measurement, beam symmetry tuning, D rate constancy check, vector scan and TG51 lead foil measurement for low and high energy Photon . electrons. All the measurements should be computer controlled and user friendly. All compone

comply with national and international regulations and safety rules. All components of the system a all available options are controlled by the same software that runs under Microsoft Windows of lat version of window 2000 and Windows XP. The system should suitable to measure pulsed radiation w fluctuation dose rate

Ion Chamber:

Necessary thimble ionization chamber should be there for measurement of field and reference signal plane parallel chamber should be there for electron measurement. The necessary holding devices a extension cables for the above chambers must be included. The chamber specification should be quot The position accuracy should be better than ±0.1mm. The chambers should be properly calibrated a given necessary calibration certificate.

The positioning tool should be there to allow easy and exact positioning of the chamber's geometri centre in the central beam and at the water surface. Apart from this the exact position of the chamber 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 (mm. The scanning speed should be adjustable between 5mm/s and 50mm/s in 5mm/s small ste Further the delay times for each step should also be adjustable by the user. The acceleration of the st 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 a permanently in the control unit.

The control pendant should display the actual position of the chamber position at any given measuri time.

Water Phantom/ Radiation Field Analyzer:

The scanning volume should be large enough to scan and should not be less than 48x40x48 cm

To avoid bending of the tank's walls by water pressure and water absorption of the acrylic material t wall thickness should be not less than 2.0 cm

The motor of the moving mechanism should not touch not touch nor dip to the water to avo mechanical stress to the acrylic tank.

The reproducibility of a position should be ±0.1 mm throughout the whole phantom.

The digitally driven stepper motors should provide hysteresis free movements (stick and slip free).

The lift table should be electrically as well as manually operable.

The velocity of the vertical motion should be quoted and preferably should have two vertical velocities

The Water Tank must be rotatable into positions 0 degree, ± 45 degree and ±90 degree.

A highly accurate Positioning device directly supplied by the principals must be included.

Water reservoir

The water reservoir should be large enough to store the water and can be pump and drain to the wa phantom as quick as possible. The water Reservoir must be able to hold the entire weight of the wa without any change

The weight of the whole assembly can be puss or pull though the wheel with polyethylene or equivale

The lifting carriage should be electromechanical/elevating screw mechanism that keeps the heig absolutely accurate

The Lifting carriage and Water Reservoir must be imported and directly from the suppliers and must complete with all facilities including TPR and TMR measurements. Completely Integrated Lifti Carriage and Water Reservoir.

The Water Reservoir must be compatible for TPR measurements and hence for TPR measurements t pump of the reservoir should drive automatically and electromagnetic valves makes sure that no wa can flow the phantom tank to the reservoir during automatic TPR measurement.

The water reservoir should have a safety circuit that avoids the dry pump running

Control Unit/Electrometer:

A separate control unit for controlling the movement of the detector in any three directions should possible.

A separate electrometer to collect the ions/dose from the chamber/detector should be there. The voltag to the chamber should be adjusted in the electrometer in steps of 50 V. The polarity of the chambe should be toggled between +/-. The electrometer should also be able to measure absolute doses for lo and high energy photon and electron.

The gain of the electrometer should be automatic depending upon the signal collected by the field an reference detector. Further the user should also be given an option to change the gain to field an 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 connecting to the water phantom.

The control unit should permanently store zero point, reference point and limit points for wate phantom, air scanner and mechanical film densitometer separately.

These different sets of limit, 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.

The communication between the control unit and the computer should performed by a standard RS23 interface.

The high voltage for the probe should be switchable independently for each decreased in differen voltage and sign of the measuring signal can be reversed.

A solid, water equivalent phantom made up of slabs of different thicknesses shall be provided by the vendor for external beam teletherapy dosimetry. It shall be possible to use this phantom for both photor and electron beam dosimetry. The phantom shall be free of contaminants and air bubbles. The slab shal be of 30x30 cm or more size totalling a thickness of 30 cm.

Control Computer:

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).

The software:

Measurements can be done against time, against a monitor signal or against reference chamber

Within the moving range arbitrary points can be measured.

An arbitrary vector scan measurement should be possible.

Point dose measurement, Beam symmetry tuning and TG51 foil measurement should also be possible.

2D planes can be measured at any solid angle

Isodose can be displayed and plotted that can constructed out of profiles and depth dose curves or measured matrices. The Isodose level should be freely closable Warning before unsaved date in the RAM should be overwritten.

The Isodose levels can be chosen after the measurement and without the necessity to have the water phantom connected.

Multiple closed Isodose lines and hot spots should be detected automatically.

Single measuring points, complete curves and parts of curves should be remeasured from a user definable point.

During the measurement the measuring curve should be display graphically and online on the screen.

A special measuring program allows a dose rate constancy check including a statistical evaluation.

Any kind of open, regular shaped, blocked or wedged field can be measured.

Fields from asymmetric collimators can easily be measured.

A special measuring routine for service purposes allows to easily checking the beam with respect to symmetry, flatness, homogeneity and energy.

Implemented routines allow the measurement, formatting and transferring of basic date to all-important therapy planning systems.

ION chamber based Survey meters to be provided.

Secondary standard Dosimeter with appropriate thimble chamber and parallel plate

chambers with latest calibrations to be provided. Including pin point chamber for small field dosimetry with phantoms, barometer and thermometer.
Solid equivalent slab water phantom with adapters for the above mentioned chambers should be provided.
Film Dosimetric software should be provided for treatment verification.

Administrative Data:

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.

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 the protocols DIN 6800/2 IAEA TR277, ICRU 35, CRMRI no.2, AAPM TH21/TG 25 and NACP.

Data transfer and data presentation

Modules should allow automatic formatting and transferring of measured data to treatment planning system available in the department.
The measured data can be stored in two different ASCII – formats (with selectable separation characters).
ASCII –data can be sent from external computers and be imported in to the water phantom software.
Image date for film dosimetry can be imported in to water phantom software. Data can be display graphically on the screen.
Crosshairs should allow the easy manual evaluation of a curve.
Plotting / printing of the measured data and correction functions can be printed (alphanumerically) and plotted (graphically).

ARRAY DETECTOR

One Array device must be based on ion chamber array resulting in an effective measuring field of 27 cm x 27 cm and giving the facility to use with slab phantom for measurements. The chamber must be a vented plane-parallel square shaped ion chambers with 5mmx5mmx5mm size and center to center spacing must be 10mm.
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 and also 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, ARC beam techniques. It should be capable of doing complete pretreatment patient plan verification with on 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 synchronou

measurements with the Linac Gantry Rotation. The detector should always be perpendicular to the be & thus removing the angular dependence.
The software should have the functionality like 3D volume analysis and CT overlay.
One additional Array Device with 900 or above liquid filled ionisation chamber for patient pl verification & quality control of small fields. Detector spacing should be 2.5mm & the maximum fi size should be above 10 x 10 cm & below 12 x 12cm essentially for use with Small feild dosimetry. Tl Array device should also be usable for Stereotaxy work. This Array device should be usable with t Cylindrical & Rotational Phantom.
One parallel plate chamber for electron dosimetry, one number of pin point chamber for small fi dosimetry along with the calibration certificate for all these chambers.
Calibrated Barometer and thermometer to be included.

26. Immobilization devices

4 set Universal treatment base plate Made of Carbon Fiber Immobilization devices having a total solution to treat Pediatric to Adult, Head and Head & Neck Breast, Thorax, Abdomen, Pelvic with facility to make custom made Supine and prone head rest for Individual Patients to maintain an accuracy of less than 2mm. along with appropriate thermo Sheets 200 nos 40 for head, 40 H&N, 40 for breast, 40 for thorax, 40 for abdomen and pelvic. The same base plate shall be upgraded by adding localizer box, thorax abdomen bridges, wedges, Upper Arm support, lower arm support, Indexed Couch stoppers, knee rest, feet fix to adopt for SBRT and SRS/SRT frameless and there shall be 4 set of each to be provided.

The vendor shall provide 4 set of carbon fiber based Head rest, prone Head rest universal, Pediatric Supine, Cushion for shoulder. Breast board Carbon fiber with all required Accessories.

Also the vendor shall provide
Water bath with digital Temperature control 1 no
Bolus 0.5 cm 3 nos and 1,0 cm 3 nos
Body caliper 2 nos
Heat Gun 1 no
Essential tools set 1 no
Electron Foam cutter 1 no
CT markers 300 nos
Alloy dispenser 1 no
Melting Alloy 20 Kg
Styrofoam foam 30 x 30 x 1.5 cm 100 nos.
Vacuum cushions
For Head and Neck 6 nos
For Thorax 10 nos
For Abdomen 10 nos
And for whole body 10 nos.
Suitable Vacuum pump 1 no

27. Training Schedule

a) On-Site training should be provided to all staff for at least two weeks
b) Additional training to be imparted on the equipment as follows, for two Physicist and two oncologists for two working weeks in a developed world facility where the Linear accelerator

is being extensively used, two Department technician to be trained on operating procedures on the system for one week in reputed Institution in the country

OPTIONAL ITEMS WITH THE HIGH ENERGY LINEAR ACCELERATOR SYSTEM

Note: The technical and price comparison between various firms will be done for essential items only and NOT the optional items. Depending on the availability of extra funds at the time of placing the supply order, each option may be purchased in a sequential manner that is one by one starting from OPTION 1.

OPTION 1

Stereotactic solution:

a. In addition to the 2 flat energies in basic requirement, 10MV as third flat energy, there shall be additional 6MV with FFF beam dose rate of 1000MU/min or more and 10MV with 2000MU/min or more to be used with Stereotactic work for faster completion of treatment. The vendor shall also offer for more advanced multileaf collimator with 120 or more leaves and shall have 5mm leaves at the isocenter and also cover 40x40cm2 field size.

b. Also vendor may offer external microMLC if available, which shall have 3mm leaf size or less for practicing advanced SRS, SRT and SBRT treatments with all required frames, hardware and software.

OPTION-2

4D IMAGE GUIDANCE:

4DCBCT image Acquisition software: -

In CBCT, The software shall do in line acquisition & reconstruction of 4D volumetric data by sorting and reviewing the moving anatomy within the projection images and calculating a respiratory trace directly from the internal anatomy without external surrogates. Each reconstructed phase of the respiratory cycle is matched to a 3D reference image automatically to review the results quickly and efficiently and

correction vectors calculated automatically to position the tumor in either the average or the exhale position.

Also, with diagnostic images, there shall be visualization and utilization of 4D image sets to create structures and review treatment options with respiratory-correlated CT images, the robust toolset to multiple view such as cine' and variable window formats, and automate processes for creation of Internal Target Volumes.

The Software shall help in visualization and navigation of 4D patient data from CT, PET, MR and Respiratory Correlated CT, to allow clinicians to display any data set in any window and review changes to the tumor over the respiration cycle and enhances the planning process by importing Maximum Intensity Projection and other specialty images directly from the imaging device, or create these images from 4D image data. MIP and MinIP images are formulated from the original data set based on the needs of the clinic and the viewing preferences of the clinicians.

In this the Internal Target Volumes shall automatically be created from the envelope of structures that constitute the tumor volume on multiple respiratory correlated image sets with automatic margins for the Planning Target Volume. segmentation with rapid structure delineation performed on any view including transverse, sagittal and coronal and updated in real-time on other planar views. This procedure is to correct for the base line shift that occurs in lung tumors and for this the 4D CT scanner software will be made available by the buyer institute to make the system complete.

Additionally the CBCT shall have option to do Registration Region of Interest generated from any structure imported from the Treatment Planning System, or created manually using tools in the software for generation of a 3D registration volume which conforms to anatomical structures.

The registration of two separate areas of anatomy in CBCT, utilizing both the Clipbox and the Shaped Registration Region of Interest. CBCT software will calculate the relationship of both areas of anatomy to the proposed correction vectors and alert the user if the target has moved closer to the critical structures due to anatomical changes which enable user to select a compromise between the two areas, or send the patient for re-planning.

OPTION 3

Bilogical Optimization algorithm upgrade with IMRT/VMAT/Rapid Arc of the offered Treatment Planning System.

OPTION 4

4D Advanced patient monitoring device marker free, surface scan based gating system for patient monitoring in LA Room

patients positioning application shall be marker free for correction of posture errors (projectin positioning errors with colors on patient body surface) with a non-rigid algorithm, corrections can b done manually or automatically with the treatment couch.
For Gated treatment, no markers should be required, gating shall have fast setup in 30 seconds, use o two gating signal, gating window, breath-hold/free breathing technique, coaching visual (with state-of

the-art patient goggles) and audio – for prospective and retrospective gating. Motion monitoring sh also be marker free maintaining the same reference (correct) position during each treatment fract offering an automatic beam on/off trigger.

There shall be a single Camera/Projector Scanning Unit with Field of view:130cm x 80cm x 70cm and shall use Point Cloud Technology with 300,000 points which can be detected on the patient surface and shall do Back Projection to reproduc an overall precise and correct positioning of the patient. The system is Seamless in integration and s use Direct optical triangulation technology.

There shall be Low latency measurements and Measurement accuracy shall be within 0.2mm and Po monitored shall be more than 300,000. Typical time for scanning and computing a couch shift patient positioning shall not be more than 0.7sec.

Marker free patient monitoring in CT Simulator room

The system shall be Marker free and shall have References (body rendering) with two gating signals . the Patient provided with goggles for more patient convenience and patient data and reference surfaces Imported using DICOM. Scan volume (X * Y * Z): 800 * 1300 * 700 mm and Measurement reproducibility: 0.2 mm, Long term stability: Within 0.3 mm and Scan speed shall be at least 50 contours per second and for a 40 cm 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

OPTION 5

A. Robotic couch top

a) The robotic couch top comprises a fully robotic patient positioning system with capability to remotely correct misalignments of the patient not only along the traditional transversal axes, but also for roll, pitch and yaw rotations around Y, X and Z axes.

b) The 6 degrees of freedom given by the robotic couch top allow the user to reposition the patient in any direction within sub millimeter accuracy.

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.

d) The Resolution of the Robotic couch shall be 0.1 mm with speed up to 16 mm/second linear translational movement or more

I. Movement range
II. X Lateral ± 30 mm or more
III. Y Longitudinal ± 30 mm or more
IV. Z Vertical ± 30 mm or more
V. Pitch (rotation around x axis) ± 3° or more
VI. Roll (rotation around Y axis) ± 3° or more
VII. Yaw (Rotation around Z axis) ± 3° or more

e) There shall be a Tracking System, Mounted on Universal Ceiling Mount (UCM) along with software controls the robotic couch top and validates the table position which make use of high-precision camera tracks the markers on the reference frame in real time, making it possible to calculate the position of the robotic couch top for accurate positioning of the Couch top to the defined isocenter co-ordinates, relative table position or a new position based on correctional data received from CBCT, using all six degrees of freedom.

f) Robotic couch top fitted with Fully indexed Carbon Fiber table top with indexer
g) Lift capacity of the couch should be 180 kg or more
h) Specify the range of different motions of the treatment couch.
i) The maximum height of the couch shall be at least 50 cm above the isocenter 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. Motions (except couch top rotation) shall be both manual and variable-speed motor driven. At least manual Couch top rotation facility shall be provided.
j) The couch top shall have side rails for attaching universal clamps etc. Immobilization straps (patient safety belts) shall be provided.
k) Patient support panel in the couch shall be provided to facilitate large posterior treatment at extended distances without moving the patient.
l) The accessory rails beside the patient support panels shall be removable, allowing treatment and port film images without interference from the rails.
m) Convenient digital scales in metric units shall be incorporated on the couch or on an in-room monitor which will allow the operator to check the orientation of the couch height and couch angle with respect to the gantry.
n) Couch positions shall also be displayed at the control console. Accuracy of the scales for vertical, lateral and, longitudinal motions shall be within ± 1 mm.
o) Two hand pendants shall be provided for operating the machine and the table.

OPTION 6

HIGH END PATIENT POSITIONING SYSTEM ON LINEAR ACCELERATOR MEANT FOR REAL TIME IMAGE GUIDED RADIOTHERAPY, FRAMELESS RADIOSURGERY & STEREOTACTIC BODY RADIOTHERAPY TREATMENT

The specialized & independent patient positioning platform should be able to perform various specialized treatment techniques such as: Real time Image Guided Radiotherapy, Frameless Radiotherapy & Stereotactic Body Radiotherapy.

Room based Real time IGRT system (Patient Positioning and Tracking platform)
User Workstation Intel quad core 2.66 GHz workstation with below configuration as below:
- min. 4 GB RAM
- min 500 GB HDD
- CD/DVD writer
- min 4x ports
- min 2x x-ray frame grabber
- Video frame grabber
- High-end graphic card
- TFT 19" for workstation with keyboard & monitor

Room based IGRT Hardware should include –
- Ceiling mounted IR cameras
- Ceiling mounted Flat panel detector
- Power & cabling
- Ceiling mounted Monitor system
- Floor mounted KV X-ray system

Optical Tracking System:Real-time Infrared optical tracking of the patient's position and motion /external breathing patterns for initial set-up and during treatment delivery
It should have Couch motion to correct patient setups online based on reflective body markers
Interactive control suitable for 6D robotic couch.
Two Stereoscopic infrared cameras for patient tracking in 3 translational and 3 rotational degree of freedom
In-room software interface via ceiling mounted touchscreen monitor
Infrared tracking system should continuously track the external marker in any possible treatment position (coplanar & non-coplanar)
Room based KV imaging System: Two linac-independent kV X-ray units floor mounted and two ceiling mounted flat panel detectors combined with IR tracking to monitor patient's position throughout treatment delivery and error in both coplanar & non-coplanar couch position by entering the values in the iGuide system
It should have dual x-ray generator, x-ray tubes & ceiling mounted digital imagers
It should have a seamless interaction with Optical tracking system to provide a fast & accurate workflow
The 6D correction should utilize stereoscopic high resolution kV imaging in the treatment room. The KV imaging should be such that it should be able to provide standalone as well as intra-treatment imaging (while the beam is on) for any couch and gantry angle to accommodate verification needs for advanced SBRT treatment.
It should have the capability of generating monoscopic or dual snap shot simultaneously allowing quick intra-fraction tumour motion & immediate output of required corrections (should support all non-coplanar fields).
It should perform multiple 6D DRR calculation from CT data in different planes to identify rotational errors
It should have the capability to manually & automatically fuse DRR with X-ray images
It should calculate positioning errors in 6 degrees of freedom
It should allow import of images, isocenter & volumes in DICOM RT format
It should support region of interest definition for patient registration
It should have seamless interaction with the existing MOSAIQ Record & Verify system

It should have a comprehensive QA checks
It should support the following modules:
- Frameless SRS
- DICOM RT Export to R&V
- X-ray snap monitoring
- IGRT review & approval

Advanced Real time IGRT planning It should have automatic detection of internal markers & urethral stent markers
It should have an advanced review system for the room based IGRT X-ray treatment.
It should have seamless review & approval of IGRT setup with password protected workflow
It should have Target localization, patient positioning, and motion management utilizing bony anatomy or implanted fiducials for both Cranial & Extra cranial indication (whole body IGRT)
It should have Frameless Radio surgery setup in x,y,z and all 3 rotational dimensions in combination with Robotics module
Intra-fraction imaging for detection of PTV misalignments and movements at any point in time during the treatment (beam on/off; any gantry rotation, any couch rotation)
Interaction with Robotic Couch top: The system should 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

Frameless SRS capabilities integrated with robotic couch top:It should have a Non-invasive patient immobilization for Image guided set-up and should be integrated with robotic couch top with the Frameless Extension.
It should have imaging support and correction for highly accurate & precise SRS in coplanar & non-planar position
It should be capable of positioning the patient within all six degrees of freedom to precisely align the tumour within the beam path throughout the entire course of treatment.
The workflow optimized x-ray acquisition and the therapist from outside the treatment room operates verification procedure.

It should include customized mask for each patient in order to immobilize the patient while re-positioning should be done based on internal structures or bony anatomy detected with x-rays images.
The Frameless mask system should have all relevant accessories, disposable cranial SRS masks & Infrared Body markers
Quality Assurance: Relevant QA phantoms like –
- Pelvic Phantom
- Isocenter Phantom
- X-ray calibration phantom

Option 7

Please specify the software and hardware for adaptive radiotherapy.

II—SPECIFICATIONS FOR LOW ENERGY LINEAR ACCELERATOR (LA) SYSTEM

1. **Description of Function**

1.1 Low Energy Medical LA to utilize flat photon of 6 MV, only to treat both benign and malignant disease.

2. **Operational Requirements**

2.1 Low Energy Linear Accelerator complete with LA control Consoles is required.

3. **Technical Specifications**

3.1 **A.STANDARD EQUIPMENT**

1. **Photon Energy:** 6 MV for Low Energy
2. **RF Source:** Magnetron / Klystron
3. **Waveguide Type:** Standing / Travelling wave
4. **Electron Gun:** Sealed / Unsealed
5. **Treatment Modes :** Normal – TSD / TAD
   Rotation – CW / CCW
   ARC – CW / CCW
   Dose rate- MU/degree
6. **Dose-Rate for Photon Energy** : 200 MU/min and above in steps
7. **Field Size (clipped)** : For photons: Max- 35 x 35 cm2 or More Min – 1 x 1 cm2
8. **Field Size (Unclipped) 40x40cm2**
9. Penumbra 10mm for 10 x 10 cm2 field at 10 cm depth shall be <7mm
10. **Beam Flatness (PHONTONS)** Variation of x-ray intensity relative to the central axis shall not exceed ±4% over central 80% of radial and transverse axes for photons field sizes 10 x 10 cm2 to 40 x 40 cm2 at 10cm depth
11. **Focal Spot Size shall be typically 1mm or less**
12. **Photon Arc Therapy**: Bi-directional arc therapy should be included with Automatic calculation of Dose per degree based on the Dose Rate and the Arc angle set
13. **Beam Symmetry**: The maximum percent difference of average doses shall not exceed ±2% for Electrons and ± 3% for photons
14. **Gantry Rotation** : ±180° (360° total)

a) Read out – Digital and Mechanical
b) Accuracy dig – readout 0.5°
c) Control – Hand pendent and control-console
d) Target – Axis Distance – 100 ± 0.2 cm
e) ODI Range – 75 cm to 150 cm
f) ODI Accuracy ± 0.1 cm
g) Gantry Rotation Isocentre 2 mm dia. Sphere
h) No Beam – stopper

15. **Collimator: Rotation** - ± 165° or more about mid position

Control – Hand pendent and control – console
Readout accuracy - ± 0.5°
Collimator Rotation Isocentre £ 2 mm dia. Sphere

16 **Asymmetric Collimators** X & Y both Asymmetrical
Specify travel ranges & over travel range
17 **Multi-leaf collimator** (MLC) No. of Physical Leaves – 80 or above.
a) Independent drives
b) Leaf width at isocentre 10 mm or less.
c) Capable of performing Conformal therapy procedures. Interface between MLC & R&V System should be as in high energy linac.
d) Facility to treat patients conventionally, using blocks without MLC.
e) Work Station HW/SW – Specify details
f) Integration (full networking) of Simulator, CT, CT Simulator, MRI & RFA should be done via planning System
g) IMRT delivery should be provided.
h) Max. leaf retracting position
i) High over centre travel of MLC leaves (>10 cm) for conformal treatments.
j) Max. field length
k) Leaf height & material
l) Coincidence of light & x-ray field
m) Penumbra
n) Transmission
o) Interleaf leakage
p) Leaf position accuracy
q) Max. carriage speed
r) Max. leaf speed
s) Positional accuracy of the leaves during treatment
t) Two nos. of treatment parameter monitors 19" TFT to be provided

20. **Treatment Couch:**
1. Versatile extended range couch with indexed immobilization Movements:
2. Longitudinal, Lateral, Vertical and Rotation
3. Electrical / Mechanical Control
4. Control-Local and/or Remote
5. Fully Carbon Fiber table top for better Quality Portal Images
6. Minimum height from floor – app 60-65

21. Treatment Planning System –The machine should be integrated with high/Low energy LA.

22. Oncology Information System complete with Networking

Should be Networked with OIS System provided available with the first high energy linac and all required interfaces should be provided.

23. Accessories
1. Wedges – Dynamic/ virtual/ Physical please specify.
2. Front pointer – mechanical

3 Accessory mount – shadow block tray
4. 14 Block set – divergent
5. Universal Clamps
6. Side Rails on both sides of Couch for Mounting Accessories
7. CCTV/ Camera Two Nos. One wide angle & one remote control with remote zoom & focus facility
8. In-Room Colour Monitor 20" or higher
9. Laser Alignment System (4 cross laser system)
10. Interface Mount to be provided for the Simulator accessories like Shadow Block Tray etc. of the quoted Accelerator model.

24. **Dosimetry System (Photons):** Built-in chambers. Two separate sealed chambers
Precision ± 1% or 1 MU
Linearity ± 1% or 1 MU
Reproducibility ± 2% or 1 MU
Dose Rate Dependence

25. **Portal Imaging system**

1. Portal Imaging : Should fully integrate with Accelerator
Should be able to take images at any Gantry angles and Should have Digital technology with high Resolution **16 bit or more** Imaging Technology.

26. System Configuation Accessories, spares and consumables

1 consumable required for installation and standardization of system to be given free of cost.
2 The Chiller system shall be provided along with the machine by the principals.
3 A closed – circuit color TV system with TV monitors and two cameras in the linac treatment room shall be supplied.
4. A patient calling system with 6 channels shall be supplied. Internet broad band connectivity for remote servicing shall be provided.

27. **Environmental factors**
Complete installation should include:

1. Room Planning and designing and construction, Space requirements to be spelt out in advance
2. Electrical Requirements to be specified
3. All AERB Clearances and Environmental clearances to be arranged with local authorities. Institute will provide all the documentations.
4. Cooling water temperature, flow and pressure monitoring to be installed.
5. Air Conditioning and monitoring of Temperature; Relative Humidity and Air Changes (To specify no. per hour) to be installed.
6 The unit shall be capable of being stored continuously in ambient temperature of 0-50 deg C and relative humidity of 15-90%
7 The unit shall be capable of operating in ambient temperature of 20-30 deg C and relative humidity of less than 70%
8 Shall meet IEC-60601-1-2:2001 (Or Equivalent BIS) General Requirements of Safety for Electromagnetic Compatibility or should comply with 89/366/EEC; EMC-directive

31 Power Supply

1 Should work on three phase 400-440 V / 50 Hz Power
2 Resettable over-current breaker/voltage stabiliser shall be fitted for protection.

32. Standards, Safety and Trainning
Leakage Radiation Safety:

1. X-ray absorbed dose due to leakage radiation (excluding neutrons) outside useful beam but inside a plane circular area of radius 2 m centered around and perpendicular to central axis at normal treatment distance. As per International Specifications (ICRP No. 33)
2. Collimator transmission: As per International Specifications (ICRP No 33)
3. Neutron dose Inside the treatment area and Outside the treatment area: As per International Specifications (ICRP No 33)

33 **Training**

Training to be imparted on the equipments as follows:

- For one oncologist and one physicist for two week on applications in a developed facility where the LA 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.

34. Documentation

1 User/Technical/Maintenance manuals to be supplied in English
2 Certificate of calibration and inspection
3 List of Equipments available for providing calibration and routine Prevention Maintenance Support as per manufacturer documentation in service/technical manual.
4 List of important spare parts and accessories with their part number and costing
5 Log book with instruction for daily, weekly, monthly and quarterly maintenance checklist. The job description of the hospital technician and comply service engineer should be clearly spelt out.
6 Additional Documents to be enclosed with Quotation:
1. No. of similar models: India / World (enclose list of institutions)
2. No. of certified engineers in India (enclose list of names)
3. Remote Diagnosis Facility (India / Abroad) availability details.

III— EQUIPMENT SPECIFICATION FOR HIGH DOSE RATE BRACHYTHERAPY SYSTEM

GENERAL SPECIFICATIONS:

- A high dose rate Remote After loading Brachytherapy system capable of Intracavitary, Intraluminal, Interstitial, Intra operative, surface mould radiation therapy.
- The HDR system should be microprocessor based with PC control.
- The HDR system must be from a well established company with a documented history of reliability.
- The HDR system must have a symmetrical source & check cable drive.

- The HDR system manufacturer should have an ISO 9001 and FDA certification and must conform to EMC directives.
- The HDR system must have a "check" cable that automatically checks the operation of the complete system prior to treatment. The check cable must also be possible to use as a "Dummy" source to allow simulation of particular source locations.
- The system must be able to use needles of 17 guage (1.3mm diameter) and the source must be certified to 5,000 or more transfers
- The system should be in use in renowned centres worldwide
- There shall be atleast 50 installations in India.

Detailed Specification:

Treatment Unit - HDR

(1) Treatment unit should be on wheels for easy mobility within the room.

(2) Treatment unit should have a telescopic head to adjust for various heights.

(3) Separate stepper motors to control the dummy check cable and Iridium Source cable.

(4) A safe to contain the Iridium Source which complies with International safety regulations.

(5) Treatment unit should have a (built-in) integrated radiation detector (GM Tube type)

(6) Multichannel indexer with a minimum of 18 channels having an automatic / optical verification of channel number and applicator connection.

(7) The source must be retractable in the event of an emergency / power failure by following methods.

- By an independent DC motor.
- Manual source retraction through hand crank

(8) Battery back up and a detailed circuit for checking the battery condition.

Control Unit:

(1) Stand alone and independent PC based control unit with colour monitor, keyboard, mouse, printer (for hardcopy) Built in audio card, network card and a backup media.

(2) Control unit should be of user friendly console and a graphical user interface and should contain an extensive reporting facility.

(3) Control Unit software should run on Windows application.

(4) Control Unit should have a self-testing feature including battery, indexer/RAM.

- Control unit must allow storage of multiple standards and keep track of patients fractionated treatment.
- Access must be limited to authorised users with Password protection.

- The treatment times must be automatically corrected for the decay of the Iridium source
- Treatment length must cover 12/24/48cm with a corresponding 2.5/5/10mm step source size.
- There should atleast be 48 dwell position for the source in each channel.
- Dwell times for each source step to be from 0.1 to 999.9 secs.
- Display Window should show step position and corresponding dwell time to 0.1 sec
- Display of Total reference air Kerma and dose.
- The control unit should contain:
- An inbuilt protection circuit to prevent treatment without proper applicator connection and proper indexer locking.
- Online extensive display of status codes with an indication of the action required.
- Large patient database should be provided with a backup option to an external storage device.
- Control unit should contain an built-in log book and all events should be recorded.

Brachytherapy software along with independent hardware must be provided and should support all of the Brachytherapy treatment modalities including intracavitary, interstitial, intraluminal and surface mould techniques.

- All the reconstruction technique like:
    - Orthogonal
    - Semiorthogonal with reconstruction box
    - Variable angle
    - Isocentric must be available.

- Dose Calculation based on TG43

- Automatic placement of Basal Dose Points for Paris Technique.

- Different Optimization techniques like Dose point Optimization on distance and volume, Geometrical Optimization on distance and volume, Graphical Optimization with local and global control should be available.

- Fast and accurate dose calculation considering radial dose function, anisotropy function and geometric function should be there.

- Rapid reconstruction of catheter using tracking algorithm and indication of corresponding lines on the images should be present.

- For outpatient treatments, extremely accurate and dwell time optimization and dose calculation must be available.

- Wide range of dose volume histogram methods, Point dose option, Different planes view must be available.

- Inverse brachytherapy planning using simulated annealing should be offered.

- Contouring tools should have complete image fusion tools inclusive of PET CT based image fusion.

Radiation Source and Transfer Mechanism:

- The source must be a single at least 10 Ci Ir-192 source with active length of less than 4mm.
- The source cable connection must be tested to withstand 5,000 or more transfers per source. The source transfer guarantee must be high to ensure optimal usage of each individual source.
- The source cable must be able to negotiate treatment curvature of 1cm radius
- The source cable must be a multi strand of at least 49 strands and a dia of <0.9mm.
- The source cable should move forward or backward with an accuracy of ± 1mm and must be controlled by stepper motors.
- The source drive out length from indexer should at least be 1300 mm to reach farther sites of treatment.
- The source transfer guarantee must be enhanced in such a way that each source must be utilized for an extended period of time. Iridium source shall be supplied for a period of 5 years taking in to account the source transfer guarantee possible by the sources.
- The offered sources must be supplied only as and when required by the hospital without any limitation on the time period and without any break. Only the necessary documents required for the same will be provided by the hospital.

- Insurance and Freight cost of the Sources for both onward and return of used source must be included in the offer. The Clearance and transport of the offered six sources and the Re-export / disposal of the decayed sources must also be included in the offer.

- Only necessary paper work only will be provided by the hospital.

- A package of Seventeen Iridium-192 radioactive sources for a period of 5 years depending on the source transfer guarantee specified by the manufacturer must be offered.

- In case if there is limitation in the source transfer guarantee additional numbers of Ir-192 Sources to cover the required period must be offered without any additional cost to the buyer.

Applicators:

(1) Applicators to be provided for

- Cervix
- Vaginal
- Esophagus
- Flexible Implants complete set with at least 250 Numbers of Flexible tubes
- Rigid Needle Implants complete set with at least 30 Numbers of needles.
- Breast
- Head & Neck
- Bronchus
- Nasopharynx

Treatment tubes to connect all Applicators should be of constant length to prevent stretching and slippage and also should be quick fit safety connections.

Quality Assurance Tools:

- Source position check device.
- Gamma Zone monitor and CCTV
- Well type chamber for source calibration

Minimal Operation Theatre accessories:

OT TABLE, OT LIGHT to be installed at Minimal OT room available adjacent to the Brachytherapy room

FDA Approvals

State of the art latest HDR Brachytherapy System with dedicated Brachytherapy planning system should have FDA 510K approval.

OPTION:

Vendor shall offer dedicated conventional simulator to be installed with Brachytherapy system with flat panel and also shall offer HDR Brachytherapy system with Co 60 source with all terms and condition similar to the main equipment tender.

SYSTEM—B

CT SIMULATOR SYSTEM

1 **Functional Description**

1.1 A dedicated state of the art CT Simulator is required for Radiotherapy Department for conventional RT, 3-D CRT, IMRT and 4-D planning (gating) and imaging. The CT simulator supports accurate simulation, placement of treatment fields and marking of radiation field portals on patient's skin for radiation therapy of cancer patients. It consists of mainly two components namely the CT machine (hardware) and the virtual simulation software. The CT machine needed for the simulator is similar to a conventional diagnostic CT except that the gantry of the CT machine in this case should have a wider bore diameter (80 cm or more). The wide bore CT is needed in situations such as simulating a cancer breast patient with breast board. The following are the technical specifications and other details for a CT machine and the virtual simulation system:

1.2 CT Scanner

The CT scan machine should be a helical scanner with the following details:

1.2.1 The bore diameter of the CT gantry should be at least 80 cm with a display field of view (DFOV) of 70 cm or more. Accordingly, suitable high rating X-ray tube with double focus should form the part of the machine

1.2.2 It should have high precision positioning lasers in sagittal, coronal and axial planes.

1.2.3 It should be a minimum 16 slice helical/spiral machine with ≤1.0 second rotation time and a minimum of 1 mm slice thickness

1.2.4 The maximum table sag/deflection should be ≤4 mm with 135 Kg patient weight.

1.2.5 The raw data memory of the computer for storage of images should be at least 2 TB.

1.2.6 Immediate image reconstruction and display without time-delay simultaneous to data acquisition in 512X512 matrix size.

1.2.7 It should have advanced 3D image viewing functions including volume rendering technique and advanced editing functions.

1.2.8 Network module should be provided for connectivity with HIS or any other LAN. DICOM standards comprising functions such as Query/Retrieve, Send/Receive should be provided for image transfer

1.2.9 QA phantoms for image contrast, resolution and dose evaluation

1.2.10 Suitable UPS for power back- up for the CT machine and CT Simulator system should be provided

1.2.11 The X-ray generator should be high frequency generator with at least 50kW power

1.2.12 X-ray tube should have high heat storage capacity of 5 MHU or more and anode heat dissipation of 700 KHU/min. It should be a dual focal spot tube. Vendor to mention the size of the focal spots.

1.2.13 The detector system should be free from repeated calibrations. The vendor to specify the number of detectors, their type.

1.2.14 The operator console of the CT scanner protocol selection, volume rendering, volume measurements, multiplanar reconstruction and standard evaluation applications and all available post processing functions without the help of satellite workstation.

1.2.15 Post processing software: perfusion CT, VRT, MIP, MinIP SSD, Image fusion, vessel segmentation, and virtual endoscopy software to be provided.

1.2.16 Cine display should be available , both interactive and automatic , and should have a minimum image refresh rate of 8-10/sec

1.2.17 Patient registration facility including on-line registration, pre-registration , transfer of information from HIS/RIS via DICOM should be possible.

1.2.18 Pressure injector should be supplied along with 500 disposable syringes

1.3 **Simulation Software**

1.3.1 The CT Simulation workstation should be fully integrated and networked with the treatment planning system for 3D CRT, IMRT/IGRT and with portal imaging workstation at the linac console.

1.3.2 It should have capabilities for 3D viewing of images along with tools for constructing and display of high resolution (≥ 512X512 pixels) DRRs and MPRs.

1.3.3 Tools for auto-contouring of normal structures along with manual contouring of normal structures and target volumes should be included. Editing, copy and paste of structures, 3D margin tools from GTV to CTV to PTV should be available.

1.3.4 Should have capability to do online CT simulation (while patient remains on CT couch) and also offline CT simulation at physician's workstation.

1.3.5 Tools for beam placement including MLC of any make and isocentre determination should be included. The tracking laser system should be linked to the virtual simulation software

1.3.6 The supplier will be responsible for complete networking and integration between the CT Simulation workstation, Treatment Planning System and portal imaging workstation for import and export of image and data.

1.3.7 Should be a fully DICOM RT "plug and play" system for import and export of CT/MRI/PET images, RT structures and data.

1.4 Computer workstation

The computer hardware and software system should have the latest configuration available at the time of shipping with 19" high resolution flat screen monitor, high resolution graphic card and user friendly operating system. An additional workstation should be provided in the Treatment Planning System room. Colour printer should be added with each work station.

1.5 Laser system for CT simulation

International class 3 moving green/red laser system of either Gammex or LAP or equivalent make for isocentre positioning with accuracy better than 1mm shall be provided and that shall be linked to the TPS to be supplied by Linac vendor/s.

1.6 **CT Simulation Table Top :** It should be a carbon fibre flat table top with indexed patient positioning system compatible to the one used in linac. Table top shall be supplied only after consent from Linac vendor.

1.7. A dry chemistry laser camera 500 dpi or more with digital interface and control integrated with main console. The camera should print a 14" x 17" film size and it should be DICOM compatible. The price should be quoted separately.

1.8. **Lead Glass:** 200 cm x 150 cm or more with lead equivalent to meet the radiological safety requirement of AERB.

1.9. **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.

2 Turn Key related Information and support to be provided to builder / Institute:

2.5 Electrical Requirements to be specified and Cable quality from substation to linac room need to be specified which forms part of construction work.

2.6 Technical support for all local regulatory, Environmental clearances to be provided as applicable.

2.7 Technical Information on Air Conditioning requirements such as limits of Temperature, Relative Humidity and Air changes per hour etc shall be provided by the tenderer.

2.8 The unit shall be capable of being stored continuously in ambient temperature of 0 - 50deg C and relative humidity of 15-90%

2.9 The unit shall be capable of operating in ambient temperature of 20-30 deg C and relative humidity of less than 70%

2.10 Shall meet IEC- protocol

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

2.12 The vendor shall supply UPS of suitable rating with voltage regulation and Spike protection for 30 minutes back up for whole Systems.

3 Other General Requirements

3.5 Training to be imparted on the equipments as follows, For one Physicist and one oncologists for one working week each on applications in a developed world facility where the unit is being extensively used, two Department technician to be trained on operating procedures on the system for one week in reputed Institution in the country.

3.6 User/Technical/Maintenance manuals to be supplied in English

3.7 Certificate of calibration and inspection

3.8 List of Equipments available for providing calibration and routine Preventive Maintenance Support. as per manufacturer documentation in service/technical manual

3.9 Log book with instruction for daily, weekly, monthly and quarterly maintenance checklist

3.10 The job description of the hospital technician and company service engineer should be clearly spelt out

3.11 Additional Documents to be enclosed with Quotation

3.12 All consumables required for installation, standardization testing of system to be included in the cost

SECTION – XI PRICE SCHEDULE

For:

B) PRICE SCHEDULE FOR GOODS TO BE IMPORTED FROM ABROAD

D) PRICE SCHEDULE FOR TURNKEY

Read as:

SECTION – XI PRICE SCHEDULE

B) PRICE SCHEDULE FOR GOODS TO BE IMPORTED FROM ABROAD

1	2	3	4	5									6		
Item S.No	Brief Description of Goods (With make and Model)	Country of Origin	Quantity (Nos.)	Price per unit (Currency) (Pl see GIT clause 12 and 13 of SECTION II)									Unit price on DDP basis at consignee site		
				FOB price at port/ airport of Lading (Inclusive of Agency Commission)	Amount and percentage of Agency Commission	FOB Price (Excluding Agency Commission)	Insurance & Freight)	CIP by Air/Sea at the port of Entry (e)=c+d	Custom Duty amount as % of CIP (No CDEC will be issued) **	Custom Clearance & Handling charges. **	Loading/unloading inland transportation, insurance as per clause 11 of GCC & incidental cost till consignee site. **	Installation commissioning, supervision. Demonstration & training at consignee site. **	In foreign currency A= (e)	In Indian rupees B = (f)+ (g)+ (h) + (i)	Agency Commission in Indian rupees (C)
				(a)	(b	(a)	(d)	(e)	(f)	(g)	(h)	(i)	(A)	(B)	(C)

** To be paid in Indian Currency (Rs.)

Total price at consignee site

(A) In foreign currency: Column (4xA) _____(in figures and words) plus

(B) In Indian Rupees: Column (4xB) _____(in figures and words)

(C) In Indian Rupees: Indian Agent Commission Column(4XC)

Note: -

1. The tenderer will be fully responsible for the safe arrival of the goods at the consignee site in good condition as per terms of contract.
2. The bidders breakup of prices under various columns are for comparison of prices up to delivery of goods at consignee's site for tender evaluation.
3. The quoted price should be supported with original proforma invoice from the foreign manufacturers. The proforma invoice should indicate the percentage of agency commission included in the FOB prices. Indian agent to be paid in Indian Currency.
4. All the components of the DDP price will be paid by the tenderer. The purchaser will make the payment of DDP price after receipt of goods at consignee's site in good condition as per payment terms in the contract.
5. The price quoted in foreign currency in column (e) shall be converted in rupees at the rate of exchange applicable on the date of price tender opening. .

Name_____

Place:_____ **Business Address**_____

Date:_____ **Signature & Seal of the tenderer**

D) PRICE SCHEDULE FOR TURNKEY (FOR VENDORS QUOTING SYSTEM A ONLY)

Schedule No.	BRIEF TURNKEY DESCRIPTION OF GOODS	CONSIGNEE CODE	Turnkey price

Note: -

1. The cost of Turnkey as per Technical Specification (Section VII) may be quoted on lump sum along with taxes applicable on the date of Tender Opening. The taxes to be paid extra, to be specifically stated. In the absence of any such stipulation the price will be taken inclusive of such taxes and no claim for the same will be entertained later.
2. Cost of Turnkey will be added for Ranking/Evaluation purpose.
3. The payment of Turnkey will be made as per clause GCC clause 21.1 (c).
4. The stipulations in Technical Specification will supersede above provisions

Name_____

Business Address_____

Place: _____ **Signature of Tenderer**_____

Date: _____ **Seal of the Tenderer**_____

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