HLL/ID/KKD-TCC-02/16-17/06/Amt.02 **Dated:27.07.2016**

Amendment No: 2

to

Tender ref. no. HLL/ID/KKD-TCC-02/16-17/06 Dated 01.06.2016

for

Linear Accelerator

at

Government Medical College, Kozhikode.

The following amendments are incorporated in the referred tender enquiry document:

In NIT:

For:

Sl No.	Description	Schedule
i.	Dates of sale of tender enquiry documents	02.06.2016 to 24.06.2016 (during office hours)
vi.	Closing date & time for receipt of Tender	27.06.2016 at 15:00 hrs
vii.	Time and date of opening of Techno – Commercial tenders	27.06.2016 at 15:30 hrs

Read as:

Sl No.	Description	Schedule
i.	Dates of sale of tender enquiry documents	02.06.2016 to 17.08.2016 (during office hours)
vi.	Closing date & time for receipt of Tender	18.08.2016 at 15:00 hrs
vii.	Time and date of opening of Techno – Commercial tenders	18.08.2016 at 15:30 hrs

AMENDMENTS IN TECHNICAL SPECIFICATIONS		
paragraph no.	**Original Specifications in Tender**	**AMENDMENTS**
3	**LINEAR ACCELERATOR SYSTEM**	
3.5	**Electron Gun**: Specify the type with technical details - diode, triode etc, withconsistency parameters regarding electron intensity and its control. Also mention if it is permanently fixed or demountable giving details.10 years non-pro rata warranty to be provided.	**Electron Gun**: Specify the type with technical details - diode, triode etc, withconsistency parameters regarding electron intensity and its control. Also mention if it is permanently fixed or demountable giving details.
3.6	**RF power source** : Specify if its Klystron or Magnetron. Technical details regarding reliability and useful life to be provided with supporting scientific and technical documents. It should be provided with 10 years non pro rata warranty.	**RF power source** : Specify if its Klystron or Magnetron. Technical details regarding reliability and useful life to be provided with supporting scientific and technical documents. **RF Power Source replacement to be covered under Comprehensive Maintenance Contract.**
	COUCH	

6.14	The couch system should have robotic control of couch movements in all 6 dimensions (all 3 cardinal translational and all 3 rotational).If this system requires an additional couch system the same should be specified and provided. Specify the range of motion that is possible with the 6 D couch in the other dimensions.This 6 D couch should be capable of correcting remotely all translational as well as rotational errors from the console. Please specify the tolerances and the limits of correction for the couch. Specify the positional and angular accuracy in all 6 dimensions and range of correction and movement for the additional couch if required.	**6D ROBOTIC COUCH (Price to be quoted separately) :** The couch system should have robotic control of couch movements in all 6 dimensions (all 3 cardinal translational and all 3 rotational).If this system requires an additional couch system the same should be specified and provided.Specify the range of motion that is possible with the 6 D couch in the other dimensions.This 6 D robotic couch should be capable of correcting remotely all translational as well as rotational errors from the console.Please specify the tolerances and the limits of correction for the couch. Specify the positional and angular accuracy in all 6 dimensions and range of correction and movement for the additional couch if required:
	ADDED PARAGRAPH (under para 6)	**Additional (Price to be quoted separately) :** The IGRT couch with the 4 Degrees of movement with the indexed carbon fibre table top.
7	**Photon Beam**	
7.1	The following energies should be available without requiring extra cost:	The following energies should be available without requiring extra cost:
	1. With Flattening Filter :6 MV, 10MV, 15MV	1. With Flattening Filter :6 MV, 10MV, 15MV
	2. Flattening Filter Free Energies : 6 MV and 10 MV	2.Flattening Filter Free Energies : 6 MV to be quoted as standard
		Flattening Filter free beam : **10 MV, (Price to be quoted separately)**
	- mention the spread of energies from the peak values	- mention the spread of energies from the peak values

12	**Multi Leaf Collimator System**	
12.1	Should be high resolution Multileaf collimator. It should have minimum 60 pairs of leaves or more. Each leaf should have independent movement control. Specify the maximum field size at isocentre.	Should be high resolution Multileaf collimator. It should have minimum 60 pairs of leaves or more , **with resolution at the isocentre equal to 5mm.** Each leaf should have independent movement control. Specify the maximum field size at isocentre.
12.3	The leaf width at the Isocenter, should be less than 5mm. To enable stereotactic treatment modalities micro-MLC should be present in the machine. The projected width of the micro-MLC should be less than 0.5cm. If the machine does not possess the MLC then the vendor should provide the same as an additional attachment	The leaf width at the Isocenter, should be less than 5mm. To enable stereotactic treatment modalities micro MLC should be present in the machine. The projected width of the micro MLC should be less than 0.5cm. **MicroMLC : (Price to be quoted separately) :** If the machine does not possess the **micro-MLC** , the vendor should provide the same as an additional attachment.
13.12	Provision for electron arc therapy and applicators for the same must be provided. Software for control of such motion at the level of the console and any licence for treatment planning and dose calculation should be provided. Specify details of:	**DELETED**
19	**Portal Imaging System**	
19.4	Entire system should have a non pro rata warranty for minimum of 10 years	**DELETED**
19.13	Image deterioration as certified by a radiologist / oncologist will be a valid cause for replacement of the detectors or the entire EPID system as per terms of warranty	**Deleted**

20	**Treatment Planning System**	
20.1	The treatment Planning system provided must be the latest version as available with the company. ***The vendor must agree to keep the software upgraded to the latest available version for at least 5 years after commissioning in MC, CLT without extra charges. Note that upgrade includes major version upgrade also.***	The Treatment Planning System provided must be the latest version as available with the company.
20.3	It should have the facility to import CT/MRI/PET/PET CT/ ***USG/ Angiography*** and other images taken at or outside MC,CLT when available in standard DICOM format. Support for other images should be available and explicitly mentioned in the compliance statement.	It should have the facility to import CT/MRI/PET/PET CT and other images taken at or outside Medical College ,Calicut, when available in standard DICOM format. Support for other images should be available and explicitly mentioned in the compliance statement.
21	**TPS Hardware**	
21.3	Two work stations for calculation of VMAT and other forms of treatment as in 1.6 should be provided.	**DELETED**
21.6	In addition to above a database server, Information exchange server and an image server should be quoted for housing the Oncology Information Network.	**DELETED**

21.8	All workstations and servers should be seamlessly connected via networking and the the Oncology Information System Software. The system should provide connectivity for the LINAC with all its electronic systems, Treatment planning system, MLC, Portal Imaging and On Board **Imaging system,** Remote couch correction, Planned motions For non coplanar fields, **respiratory gating system including gating hardware,** portal dosimetry for pretreatment QA and all software packages required for functionality of IGRT. The networking should be done with the latest CAT 6 cables and the vendor is responsible for cable laying for the complete network	All workstations and servers should be seamlessly connected via networking and the the Oncology Information System Software. The system should provide connectivity for the LINAC with all its electronic systems, Treatment planning system, MLC, Portal Imaging and On Board **Imaging system or XVI,** Remote couch correction, Planned motions For non coplanar fields, **Respiratory Gating system or Gated Breadth hold system** including gating hardware, portal dosimetry for pretreatment QA and all software packages required for functionality of IGRT. The networking should be done with the latest CAT 6 cables and the vendor is responsible for cable laying for the complete network
22	**Treatment Planning System Contouring Software**	
22.12	Separate licences should not be required for site or organ specific atlas based Auto segmentation. Atlas based auto segmentation along with deformable image registration should be available.	**DELETED**
23	**Treatment Planning System – Radiation planning software**	

23.13	The system should allow auto conformation of MLC and blocks to various structures and shapes. ***It should support the capability to export the block shape to computerized automatic block cutter.***	The system should allow auto conformation of MLC and blocks to various structures and shapes.
25	**Treatment Planning System : Data Import & Export**	
25.3	DICOM and DICOM -RT import and export facility for import as well as export of all DICOM RT objects viz. RT Image, RT Structure Set, RT Plan, RT Dose, RT Beams Treatment Record, RT Image Registration, ***RT Brachy Treatment Record, and RT Treatment Summary Record***. Any extra licences required for any specific DICOM RT object should be mentioned clearly and provided as a part of the standard purchase.	DICOM and DICOM -RT import and export facility for import as well as export of all DICOM RT objects viz. RT Image, RT Structure Set, RT Plan, RT Dose, RT Beams Treatment Record, and RT Image Registration. Any extra licences required for any specific DICOM RT object should be mentioned clearly and provided as a part of the standard purchase.
26	**Treatment Planning System - Treatment Parameter Configuration**	
26.1	The TPS should support beam data entry via keyboard***, digitizer*** and water phantom.	The TPS should support beam data entry via keyboard and water phantom.
26.3	General beam parameters : Gantry, Collimator, Couch, conventions, single and dual asymmetric jaw limits, PDD, OAR, TAR, TPR, BSF, Phantom Scatter correction factor, wedges, blocks ***and compensators***	General beam parameters : Gantry, Collimator, Couch, conventions, single and dual asymmetric jaw limits, PDD, OAR, TAR, TPR, BSF, Phantom Scatter correction factor, wedges **and** blocks.

28	**Treatment Planning System - Calculation Algorithms**	
28.3	In addition to above , dose calculation algorithms based on pencil beam algorithm and convolution superposition (e.g. AAA, CCC) for photons and Generalized Gaussian pencil beam and Monte Carlo for electrons should be available. **The TPS should also be able to plan cases for SRS, SBRT etc**	In addition to above ,**any one** dose calculation algorithm (e.g. AAA, Collapsed cone) for photons and Monte Carlo for electrons should be available. **The TPS should also be able to plan cases for SRS, SBRT etc** **Added Para**.All necessary Hardwares and Softwares to enable smooth planning and execution of either frame based or frameless SRS and SRT treatments should be provided.Vendor should give complete details of offered SRS/SRT system
29	**Treatment Planning IMRT/VMAT Optimization**	
29.4	Optimization based on TCP and NTCP criteria (biological optimization) should be available for both VMAT and IMRT. This can be in the form of biological cost functions given in the optimization algorithm. Separate license (if required) for Biological optimization and plan evaluation (as per TCP / NTCP) should be provided for each planning station.	Algorithm for biological optimization should be available for VMAT and IMRT
30	**Oncology Information System**	
30.18	The system should be networked such that it is able to integrate simulation, CT/MRI/ PET/ 4D CT/ CBCT/ EPID/ KV imaging to the database. It should be a complete image archival, retrieval, display and export system. Reviewing of all images immediately from a remote location should be possible.	**DELETED**

30.20	The Oncology Information System should be upgraded & updated to the latest version for the next 5 years (from the date of installation***) without requiring additional payment.*** The upgradation should be made available for both minor as well as major version upgrades.	**(to be quoted as Optional) :** The Oncology Information System should be upgraded & updated to the latest version for the next 5 years (from the date of installation) **as per the SSA.** The upgradation should be made available for both minor as well as major version upgrades.
30.21	A Rack mounted server should be provided for the OIS. Give the complete and detailed specifications of all server hardware that is being quoted for the OIS point of time.**Integrated single data base system**:For efficient,error-free and to make multiple import-export reduntants, a single and truly integrated database system is desirable with a single server.All other terminals should be client to this single server and this should facilitate image storage from CT/MRI/PET and also the images taken in the treatment room.The images and all other patient (demographic and clinical) and tretament related informations(like dose,plan,QAresults,shifts applied during treatments,etc).should be seamlessly and instantly avaliable for online and offline review at any point of time.Integrated single data base system:Forefficient,error-free and to make multiple import-export reduntants, a single and truly	A rack mounted server should be provided for the OIS. Give the complete and detailed specifications of all server hardware that is being quoted for the OIS .One off-line Review Workstation with Hardware and software should be provided.

	integrated database system is desirable with a single server.All other terminals should be client to this single server and this should facilitate image storage from CT/MRI/PET and also the images taken in the treatment room.	
	If the vendor is not having these single data base server at present they should give an undertaking that the data base system should be upgraded to a single data base server whenever the vendor or the company which represents the present vendor, markets a single data base server either during the warranty or during the CAMC period totally free of cost.	**DELETED**
31	**Image Guidance for Image Guided Radiotherapy**	

31.6	It should be possible to apply the calculated lateral, longitudinal and vertical corrections along with the rotational corrections (pitch, yaw and roll) remotely from the control console for the 6 D robotic.	It should be possible to apply the calculated lateral, longitudinal and vertical corrections along with the rotational corrections (pitch, yaw and roll) remotely from the control console for the **6D robotic couch. (Price of 6D couch to be quoted separately)**
32	**On Board Imaging**	
32.8	The complete KV imaging system including the x-ray tube, detector system and robotic arms should have a non pro rata warranty for 10 years.	The complete KV imaging system including the x-ray tube, detector system and robotic arms **should be covered under Comprehensive Maintenance Contract.**
33	**Motion management and controlsystem**	**Motion Management and Control System : (to be quoted as Optional)**
33.5	The gating/active breath control/response triggering system should integrate with the LINAC and should be control the beam ON/OFF without interference from the operator.	**Optional:**The gating/active breath control/response triggering system should integrate with the LINAC and should be control the beam ON/OFF without interference from the operator.
34	**IGRT Software**	

34.13	The Respiratory Gating system should be able to provide retrospectively and prospectively gated imaging studies. The Respiratory Gating system should track the patient breathing pattern within the specific threshold that determines when the treatment beam will be gated ON and OFF.The Respiratory Gating system should be able to provide retrospectively and prospectively gated imaging studies. The Respiratory Gating system should track the patient breathing pattern within the specific threshold that determines when the treatment beam will be gated ON and OFF.The Respiratory Gating system should be able to provide retrospectively and prospectively gated imaging studies. The Respiratory Gating system should track the patient breathing pattern within the specific threshold that determines when the treatment beam will be gated ON and OFF.	The Respiratory Gating system / ABC : **(to be quoted as Optional)** should be able to provide retrospectively and prospectively gated imaging studies. The Respiratory Gating system should track the patient breathing pattern within the specific threshold that determines when the treatment beam will be gated ON and OFF.The Respiratory Gating system should be able to provide retrospectively and prospectively gated imaging studies. The Respiratory Gating system should track the patient breathing pattern within the specific threshold that determines when the treatment beam will be gated ON and OFF.The Respiratory Gating system should be able to provide retrospectively and prospectively gated imaging studies. The Respiratory Gating system should track the patient breathing pattern within the specific threshold that determines when the treatment beam will be gated ON and OFF.
34A	**ADDED PARAGRAPH**	**Added Para. : (to be quoted as Optional) : Software and Hardware Upgrade.(SSA): All Software & Hardware and networking should be covered under warranty . Software Service Agreement (SSA) for 5 years, subsequent to the Two Years of warranty should be quoted as Option. All software and hardware up-gradations should be done free of cost as per the Software Service Agreement.**
35	**Accessory System**	

35.8	A Generator with adequate power to provide backup for uninterrupted running of the LINAC machine, associated equipments, TPS and air conditioning.	**DELETED**
35.11	Separate chiller required for the LINAC ***should be an imported one and same*** shall be an integral part of the whole system for the purpose of various conditions of warranty, servicing, AMC etc.	Separate chiller required for the LINAC shall be an integral part of the whole system for the purpose of various conditions of warranty, servicing, AMC etc.
36	**Warranty / CAMC**	
36.4	State CAMC rates in Indian rupees for 8 years after expiry of the warranty period. The CAMC should include the air conditioning system, Dosimetry system ***and generator.***	CAMC rates should be quoted in Indian Rupees for 8 years after expiry of the warranty period. The scope of CAMC should include the air conditioning system and Dosimetry system.
37	**Immobilization devices**	
37.1	***All in One*** Immobilization Solution - Two set should be provided.(prices for both high density and low density should be quoted separately) All in One immobilization Solution from Orfit industries is only acceptable.	Immobilization Set - Two sets should be provided.(prices for both high density and low density should be quoted separately) All in One immobilization Solution from Orfit industries **or equivalent brand is acceptable.**
37.3	Complete set of Head Supports ***(32704 set and 32399)***, Blocks and Wedges ***(32700 set)***	Complete set of Head Supports , Blocks and Wedges
37.4	Complete Knee and Leg positioning set ***(29026, 29027, 29028 and 29029)***	Complete Knee and Leg positioning set
37.5	Complete Breast Lung Board Solution ***(Item Numbers 29008, 29013, 29009, 29015, 29010, 29017, 29018, 29019, 29007, 29011, 32015/9, 32706-MD)***	Complete Breast Lung Board Solution

37.6	Complete ***AIO*** Pelvic / Belly Board Solution ***(Item Number 29025, 29024, 29023, 29020, 29021, 29022, 32015/8, 32037)***	Complete Pelvic / Belly Board Solution
37.1	***All in One*** Immobilization Solution - Two set should be provided.(prices for both high density and low density should be quoted separately) All in One immobilization Solution from Orfit industries is only acceptable.	Immobilization Solution - Two set should be provided.(prices for both high density and low density should be quoted separately) All in One immobilization Solution from Orfit industries **or equivalent brand is acceptable.**
38	**Dosimetric Equipment**	
	added note :	**Given below are bare minimum requirement for Dosimetry , equipment with better specification shall also be considered.**

38.1	**Radiation Field Analyzer *(Blue Phantom2)-iba make-*** Require a full-fledged three dimensional Water Phantom & Dosimetry System and therapy beam analyzer for performing Off-axis profiles, PDD, point dose measurement, beam symmetry tuning, Dose rate constancy check, vector scan and TG51 lead foil measurement for low and high energy Photon and electrons. All the measurements should be computer controlled and user friendly. All components comply with national and international regulations and safety rules. All components of the system and all available options are controlled by the same software that runs under Microsoft Windows. The system should suitable to measure pulsed radiation with fluctuation dose rate. (Latest hardware and software should be provided.)	**Radiation Field Analyzer -** Require a full-fledged three dimensional Water Phantom & Dosimetry System and therapy beam analyzer for performing Off-axis profiles, PDD, point dose measurement, beam symmetry tuning, Dose rate constancy check, vector scan and TG51 lead foil measurement for low and high energy Photon and electrons. All the measurements should be computer controlled and user friendly. All components comply with national and international regulations and safety rules. All components of the system and all available options are controlled by the same software that runs under Microsoft Windows. The system should suitable to measure pulsed radiation with fluctuation dose rate. The state of the art and latest system avilable in the international market by the company should be quoted (if any new launch is available in the international market that should be quoted mandatorily).
38.2	**Water Phantom**	

	The scanning volume should be large enough to scan and should not be less than 48x48X41 cm. It should be square in shape and the system should come with suitable thickness to the avoid bending of the tank's walls by water pressure and water absorption of the acrylic material. The system should come with the latest technology which gives a certified accuracy of ±0.1 mm. The system should come with a caliberation certificate certifying the accuracy, from a secondary standard dosimeter lab. The reproducibility of a position should be ±0.1 mm throughout the whole phantom. The positioning tool should be there to allow easy and exact positioning of the chamber's geometrical centre in the central beam and at the water surface. Apart from this the exact position of the chamber in the radiation beam should be possible via software. The positioning speed should be adjustable upto 50mm/s. The acceleration of the step movement should also be changed as and when required. The zero point, reference point and limit of the different detector units should be stored separately and permanently in the control unit. The control pendant should display the actual	The scanning volume should be large enough to scan and should not be less than 48x48X41 cm. It should be square in shape (**Cylindrical phantom shall not be accepted**)and the system should come with suitable thickness to the avoid bending of the tank's walls by water pressure and water absorption of the acrylic material. The system should come with the latest technology which gives a certified accuracy of ±0.1 mm. The system should come with a calibration certificate certifying the accuracy, from a secondary standard dosimeter lab. The reproducibility of a position should be ±0.1 mm throughout the whole phantom. The positioning tool should be there to allow easy and exact positioning of the chamber's geometrical centre in the central beam and at the water surface. Apart from this the exact position of the chamber in the radiation beam should be possible via software. The positioning speed should be adjustable upto 50mm/s. The acceleration of the step movement should also be changed as and when required. The zero point, reference point and limit of the different detector units should be stored separately and permanently in the control unit. The control pendant should display the actual position of the chamber position at any given measuring time. Central axis correction should included along with the system. System with latest measuring modes like continuous scanning mode with a **speed of upto 20mm/s,without dropping resolution** . Step by step measurement mode should also be provided. **Please specify whether the offered continous mode can be used in all field size data collection.A minimum of 3 levelling screws should be attached to the phantom for very fast levelling or the latest technology like three point automatic levelling should be quoted.**

	position of the chamber position at any given measuring time. Central axis correction should included along with the system. System with latest measuring modes like continuous scanning mode of scanning ***speed more than 15mm/s, which gives the highest spatial resolution of 0.1mm at the shortest possible measuring time, will be preferred*** .step by step measurement mode should also be provided. ***levelling frame should be provided.***		

38.3	**Water Reservoir:** The water reservoir should be at least 200 litres to store the water and can be pump and drain to the water phantom as quick as possible. The water Reservoir must be able to hold the entire weight of the water without any change. The weight of the whole assembly can be puss or pull though the wheel with polyethylene or equivalent. The lifting carriage should come with the technology that keeps the height absolutely accurate. The Lifting carriage and Water Reservoir should be separate for easy movements, must be imported and directly from the suppliers. The water reservoir should have a safety circuit that avoids the dry pump running.	**Water Reservoir:** The water reservoir should be at least 200 litres to store the water and can be pump and drain to the water phantom as quick as possible. The water Reservoir must be able to hold the entire weight of the water without any change. The weight of the whole assembly can be puss or pull though the wheel with polyethylene or equivalent. The lifting carriage should come with the technology that keeps the height absolutely accurate. The Lifting carriage and Water Reservoir should be imported and directly from the suppliers. The water reservoir should have a safety circuit that avoids the dry pump running.
38.4	**Control Unit:** A separate control unit for controlling the movement of the detector in any three directions should be possible. The control unit should permanently store zero point, reference point and limit points for water phantom. It should have a time constant of minimum 20ms and the leakage current should be less than 200fA.	**Control Unit:** A control unit for controlling the movement of the detector in any three directions should be provided. The control unit should permanently store zero point, reference point and limit points for water phantom. It should have a time constant of minimum 20ms and the leakage current should be less than 200fA.
39	**ONLINE Patient dose verification (price to be separately Mentioned)**	

	The Detector for Online Treatment Monitoring should be ion chamber based for long term reliability and should be wireless and cable-free for easy utilization. It should be mounted and secured on the Linac gantry head for measurements during the actual patient treatment. It should have more than 1500 ion chambers with a resolution of 5mm or better in the central area. It should come with physical gantry angle sensor for rotational IMRT cases. It should cover the full field of 40cm X40cm.The detector layout should be efficient for treatment plan QA and machine QA. The software should be capable of doing online treatment monitoring and 3D pre-treatment QA based on actual patient CT based anatomy and not based on a phantom plan. The algorithm used by the software should be industrial standard like AAA or pencil beam or collapsed cone. Additionally, a software platform to integrate the softwares of existing water phantom and patient QA device should be quoted. It should be able to perform machine QA parameters as per TG142 standards, with the hardware already available in the institute. There should be an option of comparing the	The Detector for Online Treatment Monitoring should be ion chamber based for long term reliability and should be wireless and cable-free for easy utilization. It should be mounted and secured on the Linac gantry head for measurements during the actual patient treatment. It should have more than 1500 ion chambers with a resolution of 5mm or better in the central area. It should come with physical gantry angle sensor for rotational IMRT cases. It should cover the full field of 40cm X40cm.The detector layout should be efficient for treatment plan QA and machine QA. The software should be capable of doing online treatment monitoring and 3D pre-treatment QA based on actual patient CT based anatomy and not based on a phantom plan. The algorithm used by the software should be industrial standard like AAA or pencil beam or collapsed cone. Additionally, a software platform to integrate the softwares of existing water phantom and patient QA device should be quoted. It should be able to perform machine QA parameters as per TG142 standards, with the hardware already available in the institute. There should be an option of comparing the measured machine QA data with the water phantom commissioning data. If the necessary hardware to measure the machine QA data is not compatible, the vendor should provide the necessary hardware along with the system. It should have the necessary modules to conduct an EPID QA, MLC QA and CBCT QA. Necessary hardwares needed for performing EPID QA, should be included, except the electrometer.Dosimetry training for the online dosimetry system should be provided for two physicist in an international centre of excellence. In addition to this, onsite training should also be provided. All the expenses for the training including visa, travel, accommodation etc should be borne by the vendor.

	measured machine QA data with the water phantom commissioning data. If the necessary hardware to measure the machine QA data is not compatible, the vendor should provide the necessary hardware along with the system. It should have the necessary modules to conduct an EPID QA, MLC QA and CBCT QA. Necessary hardwares needed for performing EPID QA, should be included, except the electrometer. ***The software platform should have cloud connectivity capability and the institute should be able to compare their results with any other reference centres in the same platform, anonymously. It is the responsibility of the vendor to integrate all the existing dosimetry software to the platform.*** Dosimetry training for the online dosimetry system should be provided for two physicist in an international centre of excellence. In addition to this, onsite training should also be provided. All the expenses for the training including visa, travel, accommodation etc should be borne by the vendor.	
40	Licences	

40.4	Site wide Licenses should be provided for all the features mentioned in Oncology Information System and Treatment Planning System. The licenses should allow deformable image registration, atlas based auto segmentation, Large Field IMRT, Biological Optimization, Biological Evaluation, Smart Staging etc. The entire system should be capable of supporting VMAT planning, Deformable Image registration, Atlas based auto segmentation, Contouring, Plan Evaluation, ***Biological Optimization,Biological Plan Evaluation***, Offline Review on at least 2 independent workstations simultaneously .	Site wide Licenses should be provided for all the features mentioned in Oncology Information System and Treatment Planning System. The licenses should allow deformable image registration, atlas based auto segmentation, Large Field IMRT, Biological Optimization, Biological Evaluation, Smart Staging etc. The entire system should be capable of supporting VMAT planning, Deformable Image registration, Atlas based auto segmentation, Contouring, Plan Evaluation, Offline Review on at least 2 independent workstations simultaneously .**Biological Optimisation and Biological Plan evaluation should be available in atleast one independent workstation**.
note	***The Turnkey specifications are amended as follows. (The original paragraph : " TURNKEY DETAILS" is replaced with the following paragraph.***	
	TURNKEY DETAILS: (Cost of the turnkey should be quoted separately ; mentioning unit rates)	
	TURN KEY INSTALLATION	
	The system should be installed and handed over in working condition with all necessary electrical ,wall finishing , air-conditioning , flooring & Plumbing work undertaken by the vendor in consultation with the user dept.	
	The Turnkey Scope of Work	
a	The Supplier should inspect the proposed site offered by the Consignee, wherein the LINAC has to be installed. They are required to submit the plan for the project. The scope of work includes complete Electrical ,Wall finishing , Air-Conditioning , Flooring & Plumbing for the proper functioning of the LINAC . The supplier shall assist the user by providing necessary documentations/ technical data for regulatory clearances and approvals from local authorities like AERB , Electrical Inspectorate , State Electricity Board etc ; for all activites undertaken by them at the site.	
b	Furniture like desk, chairs, shelves etc.	
c	Air-Conditioning of Tonnage 16.5 TR will be considered for Ranking / Evaluation purpose.	

	(11TR + 5.5TR standby).
	The LINAC CENTRE shall consist of the following rooms: The plan of the LINAC site in the TCC building is provided as Annexure. It may be referred to understand the area under the scope of Turnkey
a	LINAC Treatment Room
b	Console room
c	UPS room
d	Chiller Room
e	**Bidders will have to quote <u>Unit Rates of the following components of turnkey work.</u>** **(The bidder may quote the unit rates of any other turnkey activity which is not mentioned in the list below).** **The payment for Turnkey work shall be based on the actual measurement of Turnkey work executed at the supplier at the site .** **The price quoted for 16.5 TR HVAC is included for L1 calculation of the bids.** **Bidder should clearly mention break up price of each component of turnkey separately.**
i	Electrical work
ii	Plumbing
iii	Air Conditioning (HVAC)
iv	Flooring
v	Wall Finishing & Painting
vi	False Ceiling
A	**ELECTRICAL WORK**
1	The supplier shall be required to specify the total load requirements for the LINAC centre including the load of air conditioning , room lighting and for the accessories if any. The supply line will be provided by the Institute up to one point within the LINAC centre. The mains panel & distribution panel for LINAC , HVAC , LIGHTING should be provided by the supplier. Few lights in LINAC , CONSOLE ROOMS , UPS ROOM shall be connected to the UPS to provide emergency lighting.
2	The electrical work shall include the following:
i	Wiring – All interior electrical wiring- with main distribution panel board, necessary MCBs, DB, joint box, switch box etc. the wires shall be of copper of different capacity as per the load and should be renowned make as listed below.
ii	All necessary cabling like LAN , DICOM & PACS for data interface between TPS and LINAC ; CT SIMULATOR & LINAC should be provided with adequate number of sockets.
iii	All the internal wiring done by the supplier (incl. telephone, LAN, DICOM & PACS etc) will be of concealed variety.
iv	Double earthing with copper plate for the LINAC and all accessories should be as well as the earthing for the AC should be done by the supplier. The earthing cable/wire shall be be routed through an insulation conduit end-to-end.

v	Switches light and power points should be of modular type and of standard make as listed below.
vi	General lights – Mirror optical type 1X28 W or 2X28 W/CFL fittings 2X36, 3X36 W with electronic ballasts to be provided in all areas . Light dimming facilty should be provided wherever it is necessary.
vii	All wires used must be FRLS (Fire Retardant with low smoke) type only.
B	**PLUMBING WORK**
1	All water pipes and fittings shall be of high density polythene of approved and standard make. The gratings shall be brass chrome plated. All plumbing accessories should be of standard make.
2	Chiller Piping and control panel for LINAC .
3	Tenderers are advised to visit the site of work to acquaint themselves about the levels of sub soil water, drainage facility for dewatering, accessibility to site etc. and quote the rates accordingly.
4	All sanitary wares & CP brass fitting & fixtures shall be of first quality with ISI mark (unless otherwise specified) and shall be of the make as per the latest approved list of materials as per list of approved make/model, if any. They shall be got approved by the Engineer-in-charge before incorporating in the work.
5	All the items include testing after completion of the work. Concealed/underground GI pipe line is to be wrapped with hessian cloth and painted with two coats of anticorrosive paint.
C	**AIR CONDITIONING:**
1	The area marked for Turnkey needs to be air-conditioned. Package Air Conditioners may be used according to room requirement and suitability. Humidity control should be provided to effectively eliminate moisture condensation on the equipment. The Air conditioning system should be designed with standby unit(s) to provide uniform air-conditioning 24 x 7.
2	In the case of LINAC -CHIILER is placed indoors, the Airconditioning system should be able to provide adequate ventilation and heat exchange for the same .
3	The outdoor units of AC should have grill coverings to prevent theft and damage.
4	Stand-alone Room Dehumifidiers of adequate capacity for LINAC Room , Console Room & TPS room to ensure condensation-free atmosphere for the high value equipment.
	Environment specifications:
a	Humidity range: Relative humidity 60% and 80% in all areas except equipment room which shall be as per requirement of the equipment.
b	Temperature ranges: 22 +/- 2° C in all areas throughout the year, except equipment room which shall be as per requirement of the equipment.
c	Air conditioning load: The heat load calculations and maintaining the desired temperature and humidity shall be the responsibility of the supplier.
D	**Flooring**
1	600 x 600 mm vitrified tiles with 100mm matching tile skirting in LINAC Room & Console Room.
	Note: Providing and laying approved quality, colour, design and shade fully

	homogeneous 600 x 600mm (thickness to be specified by the manufacturer) Vitrified tile flooring (Marbonite or Granamite, confirming to IS code 15622 with water absorption less than 0.08%) flooring in pattern as detailed in drawing or as directed by the EIC and grouted with matching colour approved quality readymade grout, curing, cleaning etc to required line level etc. all complete at all leads, lifts and heights to the entire satisfaction of the EIC. Providing and fixing 2-3mm thick POP protection over polythene covering sheet to flooring areas till handed over and cleaning, etc all complete as per drawings & specification .
2	50 mm thick cement concrete flooring with 3mm Vinyl flooring in UPS ROOM and CHILLER room.
3	Floor leveling if required to be done by supplier. All installation related floor modification (non structural) like Turntable pit, trench etc to be done by supplier.
4	The LINAC room , Console Room , Chiller Room & UPS Room will be made rodent / pest proof.
5	Mode of measurement (finished surface area of the tiles shall be measured and paid. Rate shall be inclusive of providing and laying levelling course, PVC spacers, providing and applying epoxy grout and no additional payment shall be made for wastage.
E	**Wall finishing & Painting**
1	Two coats Plastic Emulsion Paint over 2 coats of wall putty including primer in all areas not covered by wall tiles. Colour to be approved by MCH / HLL.
2	Walls Tiles – High quality High density Vitrified Tiles clad on the side walls up to a uniform height of 1200mm in all rooms; except UPS & CHILLER rooms. Colour to be approved by MCH / HLL.
	Note: Providing all tools, tackles, materials, manpower for applying plastic enamel paint over 2 coats of wall putty including primer in all areas , of approved brand and manufacture and approved shade finished with roller to wall & ceilings surfaces, in 2 coats over a coat of approved quality primer on the plastered/ POP surface, POP board/Gypsum board surfaces including scaffolding, preparation of surface, sanding, light sanding, work platform, painting equipment/ apparatus etc. required to complete interior grade finish etc. at all heights & levels complete as per drawings & specifications.
F	**False Ceiling**
1	Acoustical tile for ceiling with light weight insulating material of high quality supported on grid or finished seamless with support above ceiling. Finished with white paint or powder coated with white paint, if metallic. Ceiling height to suit the equipment mount and clearances. The false ceiling panels should be of reputed brands.
D	**Miscellaneous**
1	The LINAC room shall be provided with wall-mounted storage cupboards within LINAC room ; to store : Dosimetry & QA Items , LINAC accessories.
2	Sufficient number of Open Racks of high Quality vendors should be provided to house the immobilisation materials; within LINAC room
3	TPS room should be provided with LED X-ray Film viewer with adjustable brightness; capable of holding 3 films of 14”x17” size. – **2 no.s**

4	The CONSOLE room shall be provided with Wall mounted Storage cupboards with MDF laminate shutters ; to be fixed on the wall above the workstation/console (approx 1800mm length ; 750 mm height ; 300 mm depth).
E	**Furniture:**
1	Revolving chairs height adjustable, medium-back with hand-rest for Control room , TPS room – **12 NO.S**
2	Workstation / Tables for Console room & TPS room: The Console room and TPS room should be provided with suitable workstation(s) of reputed brand, to accomodate the various Terminals in Console Room , TPS room. The workstation shall be provided with enough power sockets , LAN sockets etc to enable smooth functioning of the LINAC and TPS.
3	Bookshelves : Four-door bookcase with glass doors and lock ,total height: approx 1700mm ; to store manuals , CD/DVDs , spares etc - **4 NO.S**
4	Shoes Rack - **2 NO.S**
	LIST OF ITEMS AND SUGGESTED MANUFACTURERS.
A	**ELECTRICAL**
1	**CABLES** - Gloster , Universal , Polycab
2	**WIRES -** Finolex, Havells ,V-Guard, RR kabel, Gloster, Anchor
3	**SWITCHES** - Legrand, L&T, Crabtree , Roma, MK, Crabtree
4	**DISTRIBUTION BOX , MCB** - Legrand, L&T, Siemens, Havels
5	**LIGHT FITTINGS** - Philips / Crompton / Kesselec-Schreder / Wipro.
B	**AIR CONDITIONING**
1	Daikin, Hitachi, Blue Star, Voltas
C	**FURNITURE**
1	Hermen Miller , Godrej , Featherlite , Wipro
D	**FALSE CEILING**
	Armstrong , Saint Gobain, Luxalon

All other terms and conditions remain unaltered.

……End…..