Specification of Digital Radiography System (1000mA)

S. No	Technical Specification
	High powered fully digital radiography system upgradable to advance technologies like dual energy substation and tomosynthesis for the Department of Physical Medicine & Rehabilitation, Regional Institute of Medical Sciences, Imphal. The Unit should be completely integrated i.e., integrated X-ray generator, Flat panel Detector and image acquisition control console. Please note: i. Equipment Datasheet submitted should be easily readable without any misprints or fabrication. ii. Simply giving page number reference of the submitted technical quotation alone will not be considered for evaluation of technical compliance, unless tender specification isalso be validated by furnishing, and giving references to the Product Datasheets, Brochures, and or Service/ Operational manuals.
	It should have following specifications:
1	**Generator**
a.	1000 mA unit with microprocessor controlled high frequency X-ray generator with power output of 80 KW or more
b.	The exposure range should be 40-150KV
c.	The minimum exposure time should be 1ms or less.
d.	There should be provision for solid state automatic exposure control.
e.	All generator parameter controls should be available on acquisition console.
2	**X-Ray Tube**
a.	Should be ceiling suspended
b.	Should have dual focus tube
c.	Small focal spot should be 0.6 or less and large focal spot should be 1.25 or less
d.	Should have motorized vertical movement of ceiling suspended tube.
e.	Field size programming should be possible.
f.	Anode heat storage capacity should be300 KHU or more(higher kHU would be preferred)
g.	X ray tube and collimator section should have automated image shuttering and cropping facility in collimator.
h.	System should be upgradable to automatic positioning facility basis exams selection such that the overhead tube suspension is aligned against both the vertical detector and the table detector. This should be possible through selected protocol from the console control panel.
i.	Overhead tube suspension (3D column stand) should also have a screen with display of important parameters and controls.
j.	Horizontal and vertical tube rotation should be ± 135º or more
k.	Should have motorized copper filter to avoid unwanted radiation
3	**Horizontal Bucky Table**
a.	Motor driven, adjustable height floating table top of carbon fiber or equivalent with four way movement.
b.	Compact bucky table with digital flat panel detector.
c.	Foot switches for adjusting height, longitudinal/side to side movements, locking.
d.	Detector movement should be synchronized with movement of the X-Ray tube.
e.	Removable grid for SID of 100cms for horizontal table applications
f.	System mustbe upgradable to automatic image stitching facility i.e., should be capable to reproduce single stitched image of 100 cm or more without seams and with least manual intervention during acquisition. (Quoting vendor need to furnish datasheet and brochure confirming this feature availability for table orshould provide CD having video playable on Windows PC to validate its claim and show the procedure followed during automatic image stitching on table)
4	**Vertical Bucky (Wall stand)**
a.	Motorized, counter balanced adjustable height vertical Bucky with digital flat panel detector.
b.	Should be possible to tilt the Vertical detector system (-15° to + 90 °) .

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c.	Detector movement should be synchronized with movement of the X-Ray tube.
d.	Removable grid for SID of 180cms for vertical bucky applications
e.	Automatic solid state exposure control should be available
a.	System must be upgradable to automatic image stitching facility i.e., should be capable to reproduce single stitched image of 100 cm or more without seams and with least manual intervention during acquisition. (Quoting vendor need to furnish datasheet and brochure confirming this feature availability for wall stand or should provide CD having video playable on Windows PC to validate its claim and show the procedure followed during automatic image stitching on wall stand)
5	**Detector System**
a.	Detector material should haveCesium iodide as scintillator material
b.	Two Digital flat panel detector systems with detector integrated into the Bucky table as well as wall stand.
c.	Minimum size of detector should be 40cms X 40 cms or more.
d.	Image matrix size 2k x 2k pixels or more.
e.	Image resolution should be 2.5lps/mm or more
f.	Tube assembly movement to be automatically synchronized with both the horizontal and vertical detectors movement
6	**Operating (acquisition) Station**
a.	Should have a high resolution TFT/LCD monitor of minimum 19" size or more (fully flat) with minimum 1024x1024 or more display matrix and antireflective front screen.
b.	System should have auto protocol select
c.	Should be capable of stitching multiple imagesacquired using automatic image stitching technology on x-ray patient table as an optional and future upgradable facility.
d.	System should have standard DICOM Services like MWL, MPPS, Print, and Storage.
e.	Should be provided with latest generation computing hardware
7	**Image Viewing, Post –Processing and reporting Station and Documentation**
a.	2MP or better dual head medical grade FDA approved monitor of reputed make need to be supplied
b.	Workstation computing hardware should be of latest generation with at least 16GB RAM, intel i7 Processor, 1TB HDD and 2MP medical display with 400 candela or more luminance.
c.	Image processing functions like rotate, mirroring, zoom, move, and windowing filter should be possible.
d.	There should be facility for measurements.
e.	Multiformat printing should be possible with user selectable options.
f.	It should be possible to create alphabetical, date wise and exam based, work list
g.	Work list should be auto refreshing
8	**Image Storage and Transmission**
a.	Hard disc storage capacity should be of 4,000 or more images
b.	The systems should support storage of images on compact discs and DVD
c.	The system should be DICOM 3.0 (or higher version) ready (like send, receive, print, record on CD/DVD, acknowledge etc.) for connectivity to any network, computer/PC etc. in DICOM format.
d.	Easy integration and networking should be possible with any other existing/future networking including other modalities, HIS and RIS and PACS. Vendor will connect it to existing/future network without extra cost.
9	**Accessories**
a.	Dry chemistry Laser Camera capable of printing radiography images with 500 DPI or more resolutionand camera should accept all size films upto 14"x17" size (three film size trays should be active).
b.	Suitable UPS of reputed make for the computer with 30 minute backup
c.	Lead glass of size 100x 150 cm or more for console room.
d.	Vendor to install wireless mike system for calling patients who are waiting outside
e.	Five light weight 'zero lead' aprons-with hangers.

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f.	A lead screen on wheels with two panels.
10	**Upgradability**
a.	System should be upgradable to the following advance technologies and the price for the same should be quoted separately in commercial bid, and same will be taken in to consideration during commercial bid evaluation for lowest price bidder 1. Energy Subtraction to allow radiographer/radiologist to view anatomy under examination differently from a single exam i.e., it should acquire two images within milliseconds at two different energy levels and should be able to generate an image with bones "subtracted" for an unobstructed view of soft tissue, and other image of the bones to highlight foreign objects or calcified structures if any. 2. Tomosynthesistechnology to produce multiple tomographic slices from a single tomosynthesis sweep, allowing the examiner to evaluate the slice of the anatomy at various depths and locate the problem by reducing tissue superimposition hides, and mimics pathologies in 2D and hence minimizing the effects of structural overlap.
b.	
11	**Warranty/After Sale Service**
a.	5 years comprehensive warranty
11	**Turnkey**
a.	Construction of a suitable room for installation and functioning of the machine
b.	Installation of the machine
14	**Essential Certification**
a.	Radiation safety certificate – offered model must have a valid type approval or NOCfrom AERB.
b.	Quality certificate: i. US FDA 510k clearance copy of the quoted model, automatic image stitching technology, tomosynthesis and energy subtraction technologyneed to be incorporated (please furnish copy of the same and website link for cross reference).
15	**Important instructions to supplier**
a	The supplier must be the Original Equipment Manufacturer
b	Turnkey installation is to be completed within 4(four) months of the placement of order.