

**Revised Specification Of 1.5 TESLA MRI FOR The Scheme Provision  
of missing specialties for up gradation of DHQ Hospital into  
Teaching Hospital After Pre-bid meeting held on 5-11-2018**

Latest generation, latest technology high resolution 1.5 tesla MRI system  
Wide bore 70cm or more

**A. MAGNET**

Magnet Type: Super conductor  
Field Strength: 1.5 Tesla  
Helium Boil Off: Zero Boil off with 10 years helium warranty  
Shielding method: Active/Passive  
Shimming Method: Active / Passive  
Bore Diameter: 70 cm or More  
Magnet Length: 170 cm or less  
Magnet Field Stability: 0.1Ppm/Hr  
FOV: 5-50 cm  
Other Features: Operating panel on both sides of gantry with patient positioning display, laser light localization, In-bore lighting & ventilation  
Magnet Homogeneity: 1.0 ppm or less in 40cm DSV

**B RF SYSTEM**

Transmitter Type: Digital / Optic Fiber based RF System  
Transmitter Power: 15KW or more  
RF Receive Channels: 24 standard simultaneous independent receiving channels / direct digitization  
Gradient: 33mT/m or more  
Slew Rate: 125mT/m/s or more

**C EXAMINATION COILS**

Whole Body coil: Gantry Integrated whole body imaging  
Head/neck: 16 Elements or more, Array Head Coil for Head Imaging (parallel imaging compatible)  
Spine: 24 Element or more spine coil (parallel imaging compatible)  
Neuro-Vascular / Coil: 24 Element Array Neuro Vascular Coil for Aortic Arch and Carotid Imaging / Coil Combination of Head / neck / spine Combination  
Torso Coil: 16 Element or More / with coil combination Torso Coil (Parallel imaging compatible)  
General purpose/ Flex Coil: 8 elements or more

**DEDICATED COILS**

*Da*      *Q12*      *af*      *rust*

Ankle	16 elements or more ( parallel imaging compatible) / Flex Coil
Shoulder	6 Elements or more (parallel imaging compatible)
Wrist	6 Elements or more (parallel imaging compatible)
Knee Coil	8 Elements or more (parallel imaging compatible)
Breast Coil	8 Elements or more

Multiple coil connection at least three coils (head, body & spine) must be connectable simultaneously.

**D ACQUISITION PARAMETER**

Slice thickness 2D/3D	0.1 mm to 0.5 mm or better
Parallel Imaging	The system should offer parallel imaging capability (Sense/ASSET/iPAT/Speeder/RAPID)
Acquisition matrix	1024 x 1024

**E PATIENT COUCH AND COMFORT**

Type	Motorized patient table with height lowering capability
Weight Bearing Capacity	150 Kg or more
Table Length	2.0 meter
Min. Height	0.7 meter or less
Gating	EKG Cardiac gating system, Peripheral pulse gating system, Respiratory gating system or VCG or compatible.
Motion Correction	for all anatomy
Intercom	Integrated Two Way Communication
Between Patient & Operator	
Safety/Emergency Run Down, Safety Switches for Emergency Ramp Down	
Feet first scanning	Overhead/ couch built in camera alongwith LCD display

**F (CONSOLE / HOST / RECON)**

Standard Console	Standard keyboard and Mouse, Automated Scanning capability and user friendly interface base
Hard Disk Capacity	1TB or more / or manufacturers maximum specified with minimum storage capacity of 250,000 uncompressed image at 256 x 256 matrix
DVD / CD R/W	DVD / CD Writer must be included
Connectivity / Networking	DICOM 3.0 Query / Retrieve, Modality Work list, storage & print to be included
Display Monitor	19 inches or more LCD/TFT monitor (Flicker free & High Resolution)
Reconstruction Speed	Minimum 5000 Images or FFT / Sec (256x256 matrix)at full field of view
Image Reconstruction	Intel Quad Core / AMD Opteron & 8GB RAM or more CPU & RAM

All imaging sequences and MR applications as listed below

**MRI DEDICATED WORKSTATION**

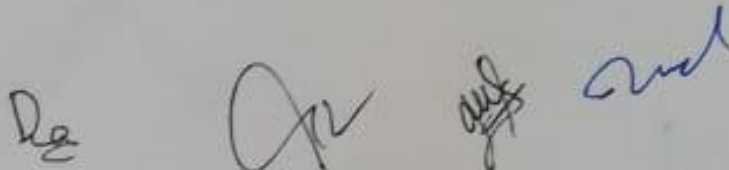
*Ra* *AK* *gust* *and*

Original Workstation supplied by the Manufacturer as MRI system to be offered. (Qty-3)  
or thin client solution offering same functionality with licensed software having three concurrent  
user licenses with necessary hardware

Standard Console                      Standard key board and Mouse, user  
friendly interface base  
Hard Disk Capacity                      400GB or more / Minimum storage  
capacity of 400,000 uncompressed                      image at 256 x 256 matrix  
DVD / CD R/W                      DVD / CD Writer must be included  
Connectivity / Networking                      DICOM 3.0 Query / Retrieve, Modality  
Work list, storage & print to be included  
Display Monitor                      19 inches or more LCD/TFT monitor  
(Flicker free & High Resolution)  
CPU & RAM                      Intel Quad Core / AMD Opteron & 12GB  
RAM or as per Manufacturer                      Recommendation or Linux OS  
Post Processing                      Post Processing for Basic & advanced  
MR applications to be included

#### H APPLICATION SOFTWARE

Spin Echo (single and multi-echo)  
Fast Spin Echo  
Gradient Echo  
Inversion Recovery, IR-STIR, FLAIR, dual IR for fat fluid and tissue suppression  
Fast Inversion Recovery, Fast FLAIR  
Echo Planner Imaging (Single & Multi Shot)  
2D & 3D FFE and 2D & 3D balanced FFE  
2D & 3D TFE and 2D & 3D balanced TFE  
2D & 3D TOF (including TURBO, gating)  
3D Motion correction  
Phase Contrast 2D & 3D  
Fat Suppression (at least 4/5 different techniques)  
Contrast Enhanced MRA with automatic table movement  
3D isotropic imaging  
Diffusion Imaging with ADC maps for application in brain and body in real time.  
MRCP 2D and 3D  
Perfusion imaging with online calculation of hemodynamic maps like mean transit time  
time to peak, time of arrival etc.  
Brain Perfusion Arterial Spin Labeling (2D and 3D)  
Bolus tracking for real time synchronization of contrast bolus arrival.  
Single and multi shot EPI-free selection capability of single or multi shot EPI  
Dynamic Imaging (brain, liver, breast)  
Brain Volume Imaging  
Diffusion Tensor Imaging + Tractography  
Spectroscopy - Single  
Spectroscopy - Multi-Voxel (Brain, Breast and Prostate)  
Flow Analysis software with display of peak velocities  
Motion Correction for all anatomy and in functional imaging.



Fluoro Triggered MRA  
MPR-Multi Planner Reconstruction  
Magnetization transfer imaging  
Advanced volumetric imaging with T2, T2 Flair and Proton density weighted contrasts /  
Similar Solution.  
Cartilage Mapping / Similar for non-invasive imaging method for early detection of  
osteoarthritis  
Time Resolved Imaging in high resolution of multi phase 3D volumes of any anatomy for  
fast accurate visualization of vasculature  
3D non-contrast enhanced MRA application for brain, carotid and peripheral arterial  
imaging.  
3D Arterial Spin Labeling - Non Contrast whole brain perfusion  
High resolution T2 weighting for clear depiction of inner ear structures and facial nerve.  
Susceptibility weighted imaging or similar software  
MR Elastography / Relaxometry or similar sequence for body.  
Cardiac imaging package  
4D / advanced cardiac imaging package  
MRI angiogram, flow measurements, offline analysis, coronary imaging  
Advanced orthopedic software  
Advance vascular package including 3D peripheral arterial imaging  
Advance liver imaging  
Functional MRI/ BOLD imaging) with online processing  
Fetal anomaly survey/ equivalent software  
Fusion software

#### ACCESSORIES

MRI Compatible wheel Chairs (Qty 02)  
MRI Compatible patient care monitor / display on MRI Screen (Qty 01)  
MRI Compatible Trolley (Qty 02)  
MRI Compatible IV Pole (Qty 03)  
Metal detectors door and hand held detector (Qty 02)  
Standard set of phantoms for calibration of MRI.  
Online pure sine wave double conversion UPS capacity 160KVA for whole MRI suite,  
with a minimum backup time of 20 minutes on full load, (MGE, Emerson, Liebert,  
Chloride, Riello, APC, GE, or equivalent)  
Programmable, MRI compatible dual head power injector with flow / volume and  
temperature control. Mounted on mobile base with 500 disposable syringes of 150ml  
capacity and connecting tubes (medrad-bayer, angiomat / madtron / tyco or equivalent)  
DICOM 3 ready dry laser camera / imager, multi-size up to 14" x 17" for different size  
films (carestram, agfa, fuji, Konica or equivalent) for black & white printing on film,  
including 1,000 films  
Film viewer (x 04) for images up to 14" x 17" with variable light control and shutter,  
with 4x1 format; LED type (Qty 04)  
Imported water chillers as per requirement of the system with standby arrangement  
RF cage as per manufacturer's recommendation and according to site requirement.  
Audio system for patient during MRI.

Renovation and up gradation of waiting area and reporting room.  
Two film storage cabinets (14 x 17 film holding).  
MR compatible stretcher (Qty-02)  
Power generator capacity 200KVA, including ATS panel, sound proof canopy, foundation pads, earthing and cabling.  
MRI compatible oxygen cylinders 2. Compatible AMBU bag.  
Power transformer capacity 200KVA, including ATS panel, foundation pads, earthing and cabling (LT and HT) all are responsibility of bidder.

### **CIVIL WORK**

Provision of storage aluminum racks, aluminum doors with elbow action controls, paneling, lead lining, flooring, paints etc. Oxygen and suction system connection with the existing hospital pipeline. Provision of furniture (benches, LCD TV, water dispenser etc.) of MRI waiting area. Complete electricity works from power station to MRI room including earthing, power racks, breakers, DB etc.

Electrical DP, Earthing and power cable from main transformer / hospital LT panel will be the responsibility of the supplier. The installation will be a turnkey project and any modification in the existing site will be the responsibility of the firm. The firm will be responsible for complete interface free installation keeping in view the requirement and recommendation of manufacturers and its surroundings to ensure artifacts examinations/procedures.

02 X Technicians local training for 02 weeks. Biomedical engineer and Two End User Training from Manufacturer for one week. The comprehensive training covering operation, calibrations and basic services protocols.

02 x Application specialist list for 02 weeks

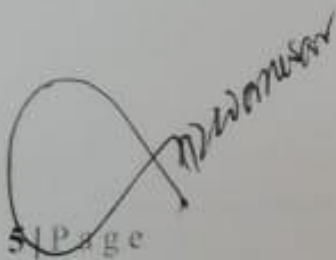
### **Note:**

I- The successful firm will be bound to prepare the building/site for new MRI system at its own cost and expenses as a complete package as per map given with bidding document.

II- The firms may additionally quote advanced available applications / packages / software's for neuro, vascular / angiography, oncology, brain etc separately as optional (which will not from the basis of acceptance / rejection).

### **Country of Manufacture**

**U.S.A / Japan / Europe union**

  
5 | Page



