No. IV-17017/13/06-Prev I  
Government of India  
Ministry of Home Affairs  

Jaitalpur House, Max Singh Road,  
New Delhi, 18-10-2006  

To  
The DG: Assam Rifles/BSF/CRPF/ITBP/NSG/SSB/BFR&D  

Subject: Finalization of QRs/specifications for Medical Equipments  

The QRs of the following Medical Equipments to be procured under Modernization Plan have been finalized and accepted by the MHA:-  

1. 500 mA X-RAY MACHINE  
2. FIBEROPTIC ENDSCOPE  
3. COMPLETE ELECTRONIC CONTROLLED DENTAL UNIT WITH ACCESSORIES & SCALER  
4. MRI PLANT (WHOLE BODY)  

2. Henceforth, all the CPMFs should procure the above items required by them strictly as per the laid down QRs/Specifications.  

Yours faithfully,  

(Alok Mukhopadhyay)  
Under Secretary (Prev-I)  

Copy to:-  
DD(Procurement), MHA  

Copy for information to:-  
1. PS to JS(PM), MHA  
2. Dir(Prov), MHA  

(signed)
SPECIFICATION FOR MRI

MAGNET
4.1 Active shielded super-conductive magnet.
- The magnet length should be 1800 mm.
- The homogeneity of the magnet should be maintained in region to 10.20, 30, 40 cm. DSV.

GRADIENT SYSTEM
- Active shielded Gradient system with strength of at least 40 mT/m or more with the slew rate of 150 mT/m/μs or more. The slew rate of 50 at 40 mT/m should be available in each and independently.

RF SYSTEM
- RF Transmitter should be fully digital with input power of at least 15 kW.
- RF Receiver system should have at least minimum 16 independent RF Quadrature RF receiving channels with each having bandwidth of 1 MHz or more.

PATIENT TABLE
- The table should be fully motorized, computer controlled table movements in vertical and horizontal directions.
- The CCTV system with colored LCD display to observe the patient.
- The table should deliver the periodic for automatic follow chasing in peripheral angiography with the automatic table movement.

COMPUTER SYSTEM / IMAGE PROCESSOR / OPERATOR CONSOLE
- Computer system should be based in the industry, fast and efficient. It should have at least 2 GHZ RAM.
- The system should have storage capacity of 100 GB for at least 100,000 images in 256x256 matrix.
- Two main computer should have at least 18 inch LCD type Color monitor. The console should have facility for music system for the patient in the magnet room.

MEASUREMENT SYSTEM
- Largest field of view should be at least 50 cm in all three axes.
- Minimum TE in Gradient Echo 2D/3D should be at least 0.7 msec, 0.7 msec or less at 250x256 matrix.
- Minimum TR in Gradient Echo 2D/3D should be at least 1.7 msec, 0.7 msec or less at 250x256 matrix.
- Minimum Slice Thickness in 2D should be at least 0.5 mm or less.
- Minimum slice Thickness in 2D should be at least 0.4 mm or less.
- Maximum Echo Train Length in both Spin echo and Gradient Echo should be at least 200 or more.
- The measurement matrix should be from 128x128 to 1024x1024 in both 2D and 3D imaging as well.

COIL SYSTEM
- The main body coil integrated with the magnet must be quadrature or. In addition to this one following coils should be included.
- 1. 19 Channel Head Array Coil
- 2. Neuro Vascular Coil with 16 channels or alternatively a head neck array coil giving 16 Channel high resolution Neuro Vascular Imaging Capability.
- 3. Array Spine Coil for thoracic and lumbar spine imaging.
- 4. Array Body coil capable of doing adipose, prostate, MRC and peripheral angiography.
- 5. Flex Coil: Large for imaging of large regions such as shoulders, hips and knees etc.
- 6. Fix Coil: Small for imaging of small regions such as shoulders, waist, lower back etc.
- 7. Small Loop Pick Coil
- 8. Large Loop Pick Coil
- 9. Quadrature Extremity Coil for Knee imaging.
- 10. Peripheral Angiogor Coil.
- 11. Cat Roi Knees.

APPLICATION SEQUENCES...
The system should have basic sequences package with Spin Echo, Focused Recovery, Turbo Spin Echo with high turbo factor of 256 or more, Gradient Echo with echo time of 256 or more.

The application software for image smoothing and edge sharpening, etc for improvement in image quality should be included and should be applicable for major imaging applications.

Image normalization should be available and should be applied for major imaging applications.

Spin and Dual echo imaging with ETL factor of 256 or more.

Single and Multi shot echo imaging techniques with ETL factor of 256 or more.

Nuclear Imaging: Should have SPECT, PET, SPECT-CT, PET-CT, and MRI and T1, T2, and T1C in the package.

For image evaluation, please specify the application package.

Diffusion-Weighted Imaging with at least a value of 1500 or more. The system should have facilities for echo time and echo time calculation of ADC maps.

Please specify if the motion correction algorithm package for high-resolution motion-free imaging is provided.

Diffusion-weighted imaging with multiparametric EPI techniques. It should be also possible to have Pd/Pd imaging to enable large-anatomical coverage of the brain and in line calculation of perfusion imaging, and to calculate the resulting homogeneity data. The perfusion analysis should have capability to calculate mean perfusion, display of WMLT, and CRV, and CBF. If the perfusion analysis is not possible on the main console, display of WMLT, and CRV, and CBF, it should be possible to have a console with a console with a main console, then the information and software to have the same should be provided or the information as detailed in item 6.07. The perfusion and perfusion imaging should be possible for the whole brain with motion.

The system should have the ability to image a scan set or to perform post-processing tasks on the main console. It should have the ability to image a scan set or to perform post-processing tasks on the main console. It should have the ability to image a scan set or to perform post-processing tasks on the main console. It should have the ability to image a scan set or to perform post-processing tasks on the main console.
The system should be capable of performing Multi Direction Diffusion weighted Imaging. Diffusion Tensor Imaging and the same should be possible on the main console.

Workstation

The additional workstation with preferably the same user interface as of the main console with the availability of MPR, MR etc. It should have 18 inch LCD monitor with hard disk of at least 50 GB or at least 160 GB image storage on 256 GB drive, and 2 GB RAM capacity or more. The workstation should have built-in CD archiving facility.

Image documentation should be possible from the main as well as the workstation.

The workstation should have availability of complete post-processing capabilities. 1. Calculation of ventricular anatomy, stroke volume, ejection fraction, relative ejection fraction, fractional area change, myocardial thickening, time volume index generation, filling rates and myocardial wall motion. 2. Graphical display of output, calculation of flow and velocity parameters with color display of velocity parameters. Cardiac flow volume studies analysis. Processing of 3200 CSI data with color Doppler imaging. If not otherwise mentioned in point 11 it should be quoted here.

Documentation

The system should have digital DICOM 3. 0 for all Chemistry Laser camera.

The system should have color laser printer for printing color images and protocols on plain paper.

UPS

The system should be provided with the 160 KVA UPS system for the complete system with at least 30 minute back up.

Suitable Enclosure

RF Cabinet. The system should be supplied with the required RF cables and interfaces for the same should be carried out suitably.

Accessories

The system should have RF compatible pressure injector from well established supplier and the control for the same should be in console room.

The system should be offered with the suitable injector system.

MR compatible Pulse Oximeter to be supplied.

Guarantee

The system should be guaranteed for 5 Years including all accessories.

Commissioning: 30 days including all accessories for 5 Year to 10 Year to be offered.