**Operational Requirements**

1. **CD recording and archival**: 1 unit.

2. **System Configurations**

3. **16-inch digital subtraction angiography X-ray system**, 1 unit.

4. **Transverse and vertical, 4 units**.

5. **Integrated 3D angiography workstation**, 1 unit.

6. **Ceiling suspended adjustable lead glass shielding at tableside**, 1 unit.

7. **Hemodynamic physiology monitor for DSA use**, 1 unit.

8. **Single-head pressure injector suitable for angiography procedures including arteriography, lumbar**.

9. **16-bit digital X-ray cassette reader, 2 units**.

10. **UPS for digital system, capacity sufficient to support 30 minutes of operation time & stabilizer for the complete lab**, 1 unit.

11. **Lead glass 100cm x 150cm of 2mm Lead equivalence with suitable frame**, 1 piece.

12. **30 x 40cm rectangular detector that can be rotated by 90 degrees for better flexibility and projection angles depending upon area of interest**.

13. **Table must have tilt facility to enhance the accuracy and efficiency of gravity-oriented procedures**.

14. **The system must have capability of memorizing at least 2 positions for easy recall of gantry positions for PTAs (Percutaneous Transluminal Angioplasty or Intervention)**.

15. **The system must have road mapping facility wherein subtracted roadmap is superimposed on live fluoroscopy. It must be possible to select different roadmap protocols depending upon the anatomy and procedure type**.

16. **System must be capable of virtual collimation of the shutters and wedges in the last image to reduce the x-ray dose**.

17. **At least +/- 15deg. tilt must be possible**.

18. **Power: at least 100kW. System must be capable of delivering minimum 3200W continuous fluoro power**.

19. **The system must have microprocessor controlled 100KW high frequency inverter generator**.

20. **Operational Requirements**

21. **Compatible**

22. **Not Compatible**

23. **Remark (Fill your Specification)**

**Technical Specifications**

- **System must have six imaging modes**.

- **Minimum Anode Heat Capacity**: 2.4 MHU or more.

- **Fluoroscopy must be possible in low frame rates up to 3.75fr/sec**.

- **Additional beam filtration of at least 1.0 mm Cu equivalent. Different filter sizes and types to be freely selectable at the table side**.

- **System must be capable of delivering minimum 2300W continuous fluoror power**.

- **X-ray Generator and X-ray Tube**:
  - **Flat panel digital subtraction Angiography X-ray system**, 1 unit.
  - **Pulsed X-ray for (subtracted) acquisition up to 8 frames/sec. for vascular applications**.
  - **Pulsed X-ray for (subtracted) acquisition up to 8 frames/sec. for vascular applications**.
  - **X-ray tube must have secondary grid switching and Dose Correction Algorithms**.
  - **Availability of Vascular analysis software both in examination room and console room**.
  - **System must be capable of virtual collimation of the shutters and wedges in the last image to reduce the x-ray dose**.
  - **Facility for motorized positioning/rotation of stand from the ceiling pivot by +/- 120 deg. and +/- 90 deg. respectively.**
  - **It shall operate on AC power supply**.
  - **4.5.6 Grab function to allow storage and archiving of fluoro image**.

- **System must have road mapping facility wherein subtracted roadmap is superimposed on live fluoroscopy. It must be possible to select different roadmap protocols depending upon the anatomy and procedure type**.

- **System shall operate on AC power supply**.
4.7.2 A motorized up-down movement of the monitor carriage will be preferred. The monitoring system capable of monitoring 2 invasive pressures and 3 lead ECG. Other functions must include NIBP, SPO2.

4.12.3 Contrast resolution for soft tissue imaging must be up to 5HU.

4.13.2 The 3D segmentation of different heart structures must be automatic. It must be possible to overlay live fluoroscopy image. The 3D image must move in real time and in sync with the x-ray system gantry rotation to help viewing the best projection.

5.3.2 Lead Glass 100 x 120 cm, 1 piece.

5.4.3.4 Single head pressure injector, 1 unit, suitable for angiography procedures including aortography.

6.1.1 Power supply: 220 – 240 VAC, 50/60Hz Single Phase or 380-415VAC 3 phase 50Hz fitted with appropriate plug. The power cable must be at least 3 metres in length.

8.1.1 User (Operating) manual in English.

8.1.2 Service (Technical / Maintenance) manual in English.

9.10. System must have an integrated 3D workstation for reconstruction of images in 3D and display of 3D images and control in intervention with the following advanced features:

- 3D road mapping to reduce contrast and time, must allow overlay of real-time 2D fluoro images on the 3D vessel image to see the progression of the needle to the target area.
- Better Stent Viewing HW and SW or equivalent to significantly improve localized stent visibility in addition to built-in software for stent visibility improvement.
- Stent Boost must have capability of showing fade-in-fadeout of lumen for better stent visibility in relation to coronary artery wall.
- Subtracted Bolus Chase: For visualization of lower peripheral vessel structures wherein the contrast bolus is followed interactively by a subtracted bolus image.
- The system must be capable of providing 3D image of the heart based on both techniques i.e. from pre interventional CT image and from an actual 3D rotational angiography acquisition in the cathlab.
- The workstation provided must have the ability to view CT and MR images also.
- The 3D image must move in real time and in sync with the x-ray system gantry rotation to help viewing the best projection.
- The system must have software to Percutaneous needle guided biopsies, drainages etc. by creating virtual paths on CT datasets. It must be possible to overlay live fluoroscopy image to see the progression of the needle to the target area.
- Better Stent Viewing HW and SW or equivalent to significantly improve localized stent visibility in addition to built-in software for stent visibility improvement.
- Subtracted Bolus Chase: For visualization of lower peripheral vessel structures wherein the contrast bolus is followed interactively by a subtracted bolus image.

8.2.1 DICOM 3.0 based CD recording for recording on CD. CD review of DICOM CD's.

9.11.2 DICOM dry laser camera minimum 600 dpi resolution, 1 unit

9.11.5 QC and software Kits

- Manufacturing Date must be less than 6 months before delivery

5.2.1 Ceiling suspended adjustable Lead glass shielding at tableside, 1 unit