**1 Specifications Required For Radiotherapy cobalt 60 machine**

| **1 – Scope** | | | **Comply** | **Not comply** | **Fill your Specifications** |
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| | Requirement | | | | |
| 1.1 | This specification establishes the requirement for cobalt units providing treatment using cobalt-60 as radiation source in the Oncology Department at RICK– Sudan | | | | |
| 1.2 | The equipment offered should be licensed for sale, by recognized supplier and have been tried and tested in a clinical setting. Evidence that the equipment being offered can meet the specifications shall be provided. | | | | |
| 1.3 | The equipment offered provided by a recognized supplier shall prove that the service, spares and application support is available in Sudan to maintain the system in peak operating performance. | | | | |
| 1.4 | A list of users around the world where the equipment offered is currently in clinical use should be provided, indicating the current models and equipment configuration per site. | | | | |
| 1.5 | The system offered shall comply or exceed all of the minimum performance specifications as indicated below for the various sub-components, supported by factory-supplied product specifications / brochures. | | | | |
| 1.6 | Descriptive literature, pamphlets, brochures and technical data sheets applicable to the offer (i.e. all component of the system) shall accompany the bid, a bid how fails will not be considered. | | | | |
| 1.7 | The system should perform all types of Cobalt 60 treatment mode at the RICK Sudan. | | | | |
| 1.8 | As mentioned in 1.7, the equipment shall be installed at RICK the bidders shall inspect the installation site, electrical supplies, radiation shielding and other services needed before submitting their offer. | | | | |
| 1.9 | The bidder applying for the tender must be the manufacturer or the official representative agent of the manufacturer. Original documents must be provided (photocopy or computer print will not be accepted). | | | | |
| 1.1 | Technical specifications and invoices must be provided by the manufacturer. Documents must be supported by original manufacturer brochure and product catalogue (photocopy or computer print will not be accepted). | | | | |
| **2- Technical Specifications** | | | | | |
| 2.1 | Source | Cobalt – 60 source | | | |
| 2.2 | Source head capacity | At least 200 RMM or higher, size 2 cm or less. | | | |
| 2.3 | Source shielding | The shielding must be sufficient to accept at least a 200 cGy/m source (standard shielding blocks). | | | |
| 2.4 | Source strength | The nominal source strength must be between 150 - 200 cGymm | | | |
| 2.5 | Source length | The source must be 2 cm or less in diameter | | | |
| 2.6 | Gantry | Motorized rotation (± 360° CW & CCW), unit offered comply with IEC specification for mechanical accuracy and stability and the unit offered to conform to IEC requirements both in performance and standards regarding movement. | | | |
| 2.7 | Counter weight | Pendulum type | | | |
| 2.8 | Source to Axis Distance (SAD) | 100 cm SAD | | | |
| 2.9 | Dose rate at SAD | Not less than 150 cGy/min | | | |
| 2.1 | Isocenter accuracy | Within a sphere of radius 3 mm or less. | | | |
| 2.11 | Collimator rotation | Motorized rotation (±185) with 1° increment scale. Isocentric rotation. | | | |
| 2.12 | SSD indicator | Optical indicator with accuracy of ± 2 mm | | | |
| 2.13 | Variable field size.<br>a) X-axis<br>b) Y-axis | <br>4 cm. to 40 cm.<br>4 cm. to 40 cm. | | | |
| 2.14 | Diaphragm blades motions | Asymmetric | | | |
| 2.15 | Field size selector | Motorized / Manual. | | | |

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| 2.16 | Field size display | Digital display on console and on inside monitor room. | | | |
| 2.17 | Treatment prescription | Must be either manually entered or sent via network and the record and verify system. | | | |
| 2.18 | Physics data | Complete set of beam physics data. | | | |
| 2.19 | Mechanical SSD indicator | Should be supplied | | | |
| 2.2 | Hand control box | Should have switches for controlling the movements of | | | |
| 2.21 | Wedges | 15°, 30°, 45° and 60°. | | | |
| 2.22 | Beam modifying device | Beam shaping blocks of various sizes wedge filters of various sizes. | | | |
| | | Breast treatment devices. | | | |
| | | A set of shielding trays. | | | |
| 2.24 | Treatment mode | Static and arc therapy | | | |
| **3 - Power Supply** | | | | | |
| 3.1 | Input power | Should be 230 ± 10% VAC, 50 Hz (single phase) . Attach | | | |
| **4 - Patient Table** | | | | | |
| 4.1 | Table mounting | Isocentrical mounting | | | |
| 4.2 | Table motions | All movements of couch, table and table top should be motorized with tolerance of ONE mm. | | | |
| | | Locking facility for the longitudinal and the lateral table top movements. | | | |
| 4.3 | Table top | The table should have open window with tennis racket insert, facility for taking manual support and the table must fitted with a MedTec carbon fiber top of the same model as linac. | | | |
| 4.4 | Weight | The table offered must be able to support patient up to at least 180 Kg in weight. | | | |
| 4.5 | Standard | The table offered must comply with IEC standards / recommendations. | | | |
| **5 – Console** | | | | | |
| 5.1 | Timer | Should content Dual timer channel, treatment selection switch | | | |
| 5.2 | Power switch | ON / OFF switch. | | | |
| 5.3 | Indicators & emergency switch | Sources position indicators and emergency stop switch | | | |
| 5.4 | Treatment prescription | Must be either manually entered or sent via network | | | |
| 5.5 | Parameter display | The parameter must be displayed at console | | | |
| 5.6 | Computerized control console, interfaced with a record and verify system. | | | | |
| **6 - System Accessories** | | | | | |
| 6.1 | CCTV system for the unit – camera and 2 set of monitors | | | | |
| 6.2 | A set of 3 lasers to be provided | | | | |
| 6.3 | Standard supine base plate (head & neck) | | | | |
| 6.4 | Lateral base plate | | | | |
| 6.5 | Head & neck prone base plate (adjustable) | | | | |
| 6.6 | Head & neck supports A, B, C, D & E | | | | |
| 6.7 | Knee crutch and arm position with hand grip | | | | |
| 6.8 | Overhead arm positioner | | | | |
| 6.9 | Shoulder retractor | | | | |
| 6.1 | Gamma zone monitor shall be supplied. | | | | |
| **7 - Radiation & Electrical Safety** | | | | | |
| 7.1 | There must be visual and audible indications when the beam is ON. There must be a loud | | | | |
| 7.2 | The used source must be return to the supplier | | | | |
| 7.3 | The jaws are to be closed automatically when the source is stuck in any position. | | | | |
| 7.4 | There must be a mechanical back up system to return the source to the safe position in the event | | | | |
| 7.5 | Electrical safety confirms to standard for electrical safety IEC-60601 / IS-13450. | | | | |
| 7.6 | Should be FAD, CE, UL or BIS approved product | | | | |
| **8 – Training** | | | | | |
| 8.1 | Onsite training | Must be given to: Radiographers, Biomedical Engineer, physicists, Radiation oncologists on operation and daily clinical use of cobalt-60. | | | |
| 8.2 | Out site training (on factory) | Must be given to: | | | |
| | | Two service engineer (full training on the cobalt machine maintenance (not less the 3 weeks). | | | |
| 8.3 | Type and cost of extra training | For Service engineering | | | |
| 8.4 | Future training | Service engineering | | | |
| **9 – Warranty** | | | | | |
| 9.1 | Bidders must supply Three years warranty against poor workmanship and latent defects and parts. This must be all inclusive and include, amongst others, ALL PARTS, labour, traveling and accommodation. | | | | |

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| 9.2 | A fully comprehensive preventive maintenance, service and repair plan including all costs must be included in the three years warranty. Software update and upgrades are also to be included. | | | |
| 9.3 | The Three years warranty commences after formal acceptance and handover of the equipment. | | | |
| 9.4 | Max time of delivery & Warranty period of spare part, should be clearly specified. | | | |
| **10 – Documentation** | | | | |
| 10.1 | Users, Technical and Maintenance (Service) and Operation Manuals to be supplied in English, along with 2 sets of hard copies and 1 set of soft copy. | | | |
| 10.2 | Certificate of calibration and inspection should be provided. | | | |
| 10.3 | List of equipments available for providing calibration and routine preventive maintenance support. As manufacturer documentation in service / technical manual. | | | |
| 10.4 | List of important spare parts and accessories with their part number and prices. | | | |
| 10.5 | Log book with instructions for daily, weekly, monthly and quarterly maintenance checklist. The job description of the hospital Engineer and company service engineer (during the warranty period) should be clearly spelt out. | | | |
| **11 – Cost of Ownership / Risk** | | | | |
| 11.1 | The unit must be established with a documented history of reliability and must be approved and licensed by the department health | | | |
| 11.2 | No part shall be second hand or refurbished, it must be the latest mode estate the date of product. | | | |
| 11.3 | The company must have will trained and highly qualified engineer (at least 3). The response time for a call-out must be less than four hours. | | | |
| 11.4 | If you are using software in the machine. State the period for its upgrading and include the cost in purchase. Estimate the additional cost for the 5 years past the warranty period. | | | |
| 11.5 | The up-time of the unit must be better than 95%, excluding the scheduled preventive maintenance and software upgrades (if applicable), measured on a quarterly basis. The percentage lower than 98% will be added to the warranty period. | | | |
| **12 - Additional Requirements** | | | | |
| 12.1 | The unit shall be capable of being stored continuously in ambient temperature of 0 – 50 °C and relative humidity of 15 – 90 %. Also the unit must be capable to operate in ambient temperature of 20 – 30°C and relative humidity of less than 70%. | | | |
| 12.2 | The existing unit must be removed and the source safely and legally disposed of. However the usable spare parts must be left in storage on the institute premises for use as spare parts. | | | |
| 12.3 | Complete installation should include: | | | |
| | Room planning and designing and construction. Space requirement to be spelt out in advance. Site study in advance prior to be submitting the bid. | | | |
| | Electrical requirements to be specified and substation to be made. Site visit a must before submitting the bid. | | | |
| | Monitoring of temperature; relative humidity and air changes to be installed. | | | |
| 12.4 | State the time period require for the following: | | | |
| | The time required from the date the order was placed to date of delivery of the equipment to the institution. | | | |
| | Time required finalizing the building alterations. | | | |
| | Time required for installation and commissioning from the date of delivery of the equipment to the institution. | | | |
| | Total time required from the placement of the order to the commissioning of the equipment. | | | |