

Proj. Ref. No.: **PUR21-07-0669**  
 End-User: **DIVISION OF RADIOLOGY**  
 Project: **SUPPLY, DELIVERY, INSTALLATION, TESTING,  
 AND COMMISSIONING OF BRAND-NEW LINEAR  
 ACCELERATOR SYSTEM WITH RELATED  
 SPECIALTY WORKS FOR THE PHILIPPINE  
 GENERAL HOSPITAL CANCER INSTITUTE**

Opening of Bids: **October 29, 2021**  
 ABC: **PHP230,000,000.00**

Contract: **SINGLE BID**

Item No.	Qty.	UOM	Item Description	Unit Cost	Quotations (all taxes included)	
					in figures	in words
1	1	Unit	Project: Acquisition/Purchase of One (1) Unit Linear Accelerator (Radiotherapeutic Unit) PGH, UP Manila  Project Profile: This project entails the supply, delivery, installation, testing, and commissioning of brand-new Linear Accelerator System with related civil works for the Philippine General Hospital - Cancer Institute  Project Design: Please see attached Proposed LINAC Bunker and Support Spaces	230,000,000.00		
			<b>I. SCOPE OF WORK</b>			
			I. Civil Works			
			A. Design Phase B. Construction Phase			
			II. Supply, Delivery, Installation, Testing, and Commissioning of Brand-New Linear Accelerator System			

Approved by:  
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			A. Installation of LINAC Machine B. Technical Specifications of the LINAC Machine C. Fully integrated MV CBCT Imaging System D. Fully integrated kV CBCT Imaging System E. Immobilization Devices F. Oncology Information System (OIS) with Networking, Record and Verify System G. Treatment Planning System (TPS) H. LINAC Accessories I. Other requirements of the LINAC Machine J. Technical Specifications of the Dosimetry System K. Accessories and Supporting Equipment L. Provision for Future Remote Access to OIS and TPS M. Commissioning of the Linear Accelerator			
			<b>A. Design Phase</b>			
			1. The winning bidder shall prepare and submit signed and sealed complete Engineering Design Plans in 20" x 30" size of 3 copies, Scope			

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			<p>of Works and Specifications of the Construction of Bunker and Facilities based on the PGH issued Schematic Architectural Plans and Engineering Brief Description of Works to be approved by to be approved by the OETS, the Chair of the Department of Radiology, the Deputy Director for Administration, and the Director.</p> <p>An electronic form shall also be submitted via e-mail to the end-user and the OETS.</p> <p>Engineering Design Plans shall include Structural Design, Architectural Design, Electrical Design, Mechanical (Airconditioning, Ventilation, Fire Pump System) Design, Telephone and LAN Design and Plumbing (Water, Sewer and Storm Drainage System) Design.</p> <p>Submission of complete electrical plans, signed and sealed by a professional electrical engineer and</p>			

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					in figures	in words
			for checking prior to endorsement by the OETS to the PGH Administration.  Design for appropriate air-conditioning system (chiller type and split type) needed for Linac Bunker and Offices			
			<b>B. Construction Phase</b>			
			1. <b>Permits and Bonds.</b> The contractor shall apply for all Government permits such as Construction Permits and Occupancy Permit and shoulder the fees hereof. To protect the existing facilities the contractor shall submit Contractor's All-Risk Insurance (CARI).			
			2. <b>Demolition Works.</b> Demolition of the Nuclear Medicine Decay Room and Pump Room.			
			3. <b>Constructions and Relocation Works</b> a. Nuclear Medicine Decay Room i. Construction of Nuclear Medicine Decay Room			

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			with appropriate radiation shielding ii. Fabrication of Metal Shelving iii. Door shall be metal with radiation shielding iv. Ducted type exhaust fan with Hepa-filter			
			b. New Cistern Tank and Pump Room i. Construction of underground Cistern Tank for domestic water pump and fire engine turbine and waterproofing (same capacity of the existing tank) ii. Construction of Pump Room. This is to house motors, fire engine and its control panel.			
			c. Bunker and Facilities i. Construction of the linear accelerator bunker with appropriate radiation shielding will follow IAEA or FDA-DOH			

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			specifications for a 6MV FFF stereotactic capability with a maximum dose rate of 800 MU/min as required by the IAEA standards. ii. Radiation survey results of the constructed LINAC Bunker (primary and secondary walls, doors and ceiling) should be below the regulatory/international standard radiation limits (instantaneous dose rate of at most 7.5μSv/h). iii. Bunker room dimensions shall be able to accommodate a machine with 6MV & 10 MV photon energy LINAC machine requirements. iv. Bunker design shall be duly evaluated and verified by the PGH in-house board-certified			

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			radiation oncology medical physicist (ROMP) and approved by the DOH-FDA before construction.			
			v. Installation of radiation warning lights and radiation signage shall follow DOH-FDA recommendations.			
			vi. The water chiller shall be connected to the existing water system of the hospital, with its accompanying water supply and plumbing.			
			vii. Complete installation of all network cabling, conduits, wirings, switches, and circuit breakers will be compatible with any winning bidder's requirement.			
			viii. There will be installation of water sprinklers, smoke detectors, fire alarm system, proper signage and fire exits &			

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			clearances as required by the Bureau of Fire Protection. Room labels will be installed. ix. Establishment of connection to the Brachytherapy CT Scan & 16 Slice Somatom Emotion located in Cancer Institute Building. x. Essential Rooms will be constructed, as follows: 1) LINAC Treatment Room Construction of storage for the following: <ul style="list-style-type: none"> <li>• Masks, breast boards, wing boards, cradles, belly board, abdomen and pelvis baseplates &amp; thermoplastic, shoulder retractor, etc</li> <li>• Linen</li> </ul>			

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			<ul style="list-style-type: none"> <li>• Machine's spare parts and kit</li> <li>Provision for the following:</li> <li>• Overhead laser and lateral wall laser installation</li> <li>• Emergency-off switches on the walls of the treatment room</li> <li>• Base frame pit and installation, with appropriate dimensions to accommodate any winning bidder's LINAC machine</li> <li>• LINAC machine's cooling system (pipes and chillers)</li> <li>• Beam on and x-ray warning lights in the treatment room and over the treatment door,</li> </ul>			

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			which indicate beam-on condition <ul style="list-style-type: none"> <li>• Dimmer switch for lights</li> <li>• Slanted holes/duct for LINAC machine cables and for Physics instrument cables into the treatment console room</li> </ul> 2) LINAC Control Console Room Provision for the following: <ul style="list-style-type: none"> <li>• countertop/custo mized computer counter for LINAC console and its accessories</li> <li>• built-in, wall- mounted cabinets for storage of patient charts</li> </ul>			

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			3) Treatment Planning Room Renovation of the existing treatment planning room, dosimetry room, and small consultation room of the existing LINAC1 facility to a new treatment planning room.  Provision for the following: <ul style="list-style-type: none"> <li>• countertop with drawers for the treatment planning system computers</li> <li>• bookshelves and filing cabinets for storing patient charts and documents</li> </ul>			
			4) Equipment & Supply Room Provision of built-in cabinets for storage			

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			of machine spare parts, engineer's tools, QA tools and dosimetry equipment  Provision of built-in cabinet for storage of immobilization devices, styro, blocks, linens, patient gowns and office supplies  5) Electrical Room Provision for the main circuit breaker, electrical line and LINAC machine's air compressor.  6) Patient Waiting Area Will be able to accommodate a seating capacity of at least 30 at a given time with space for storage and			

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			transport of hospital beds and wheel chairs  Provision for four (4) four-seater gang chairs  xi. Renovation of Cancer Institute - Room 104 1) Renovation to become a consultation room (to be done ahead of other items) 2) Provision of the following: • Fours (4) desks • Bookshelves and filing cabinets for storing patient charts and documents  xii. Provision of appropriate fire protection system  d. Relocation Works and Provision of Temporary Utilities			

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			i. Provision of temporary water supply line for SOJR building while construction of LINAC 3 is ongoing. This includes supply of 80 gallons pressure tank, 2HP water pumps, valves, fittings, electrical supply, and other needed materials to complete the installation. Electrical supply to be tapped to the nearest power source.  ii. Transfer of Water Pumps and Fire Engines including all accessories and control panel. All piping works include suction, discharge pipe, valves, reducer coupling, etc. to complete the system. Scope also includes connection to the tapping line (water and sprinkler system) and			

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			transfer of electrical power supply. iii. Testing and commissioning of the newly transferred Water Pumps and Fire Engines e. Electrical Scope i. Supply, installation, testing and commissioning of required/appropriate main feeder lines (Conduit pipes with cables) from designated tapping point at PGH powerhouse and LINAC control room including provision of required molded case circuit breaker at the source ii. Supply, installation, testing and commissioning of appropriate dry-type transformer for required hospital equipment including necessary circuit breakers at the high-			

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			voltage and low-voltage side including grounding rod and wires. iii. Supply, installation, testing and commissioning of necessary lightings, switches, duplex convenience outlets, conduits, panelboards and other materials for the necessary rooms/areas covered by this project. iv. Supply, installation, testing and commissioning of necessary wirings for all airconditioning units, exhaust fans, warning lights and exit signages v. Supply, installation, testing and commissioning of necessary controls needed for the operation and protection of			

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			equipment including uninterruptible power supply (UPS) vi. Provision of as-built electrical plan including load directory at electrical panel vii. Facilitation of electrical permits f. Air-conditioning Scope i. Design for appropriate air-conditioning system (chiller type and split-type) needed for LINAC bunker and offices ii. Centralized air conditioning system within the facility, as well as separate back-up individual air-conditioners as cited in II.K.1., will be provided. iii. All aircon units are inverter type iv. All condensing units should be installed in the roof deck of the bunker and for chiller type will be aligned to			

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			the water source for easy tapping. v. Condensate drainpipe should be embedded and tapped to the nearest drainline vi. Aircon pipes should be insulated with rubber insulation ¾ inch wall thickness and wrapped by polyethylene tape color white. Provision of hangers for piping that will be laid above the ceiling vii. Ducting for chiller type aircon should be wrapped by silver insulator according to airconditioning standards. Ducting should be provided with appropriate hangers for protection against sagging inside the ceiling. g. Materials testing			

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			Testing of materials shall be shouldered by the contractor			
			<b>II. SUPPLY, DELIVERY, INSTALLATION, TESTING, AND COMMISSIONING OF BRAND-NEW LINEAR ACCELERATOR SYSTEM</b>			
	1		<b>A. Installation and Testing of LINAC Machine</b>			
			To be reckoned upon issuance of certificate of inspection and work accomplished from OETS			
	1		<b>B. Technical Specifications of the Linear Accelerator</b>			
			1. Tight isocenter alignment, at least 1 mm isocenter accuracy for the following: <ul style="list-style-type: none"> <li>a. Gantry isocenter accuracy</li> <li>b. Radiation beam axis with the rotation of the gantry</li> </ul> 2. Fully/Completely digitally-controlled system 3. Waveguide and filter design allow at least one (1) photon energy 4. Allows for online remote diagnostic monitoring of the LINAC machine and treatment planning system			

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					in figures	in words
			during the warranty period; post warranty remote diagnostic monitoring will be the option of the procuring entity 5. Beam Energy: Photon Energy - 6MV  6. Power Source: Magnetron or Klystron as power source  7. Back-up Power Supply: Uninterrupted Power Supply (UPS) to support the Linear Accelerator Machine and all its accessories for at least 15 minutes in case of power failure (as provided by a third-party supplier)  8. Dose Rate and Beam Stability 6 MV Photon: Maximum dose rate of at least 800 MU/min at Dmax  9. Gantry a. Gantry Rotation Range: minimum of $0 \pm 185^\circ$ b. Gantry Rotation Accuracy: at least $0.5^\circ$			

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Proj. Ref. No.: **PUR21-07-0669**  
 End-User: **DIVISION OF RADIOLOGY**  
 Project: **SUPPLY, DELIVERY, INSTALLATION, TESTING,  
 AND COMMISSIONING OF BRAND-NEW LINEAR  
 ACCELERATOR SYSTEM WITH RELATED  
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 GENERAL HOSPITAL CANCER INSTITUTE**

Opening of Bids: **October 29, 2021**  
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					in figures	in words
			c. Gantry Rotation Reproducibility: not greater than 0.5° d. Gantry Maximum Rotational Speed: at least 4.0 RPM e. Gantry Display: Digital Display f. Digital display must be visible inside the bunker and treatment console 10. Bore size: at least 85 cm in diameter 11. Multileaf Collimators (MLC): a. Number of leaves: At least 110 MLC leaves b. Leaf width resolution: not greater than 6.5 mm c. Maximum leaf extend position over the isocenter: at least 14 cm d. Maximum leaf retract position over the isocenter: at least 14 cm e. Leaf over travel: at least 14cm f. Maximum leaf travel speed: at least 5 cm/s g. Leaf beam transmission: ≤0.5% h. Leaf end position accuracy: ± 1mm			

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			i. Leaf end position repeatability: $\pm 1\text{mm}$ j. MLC control must be fully integrated with the digital control system; if not, an interface between MLC and existing network system shall be provided  12. Couch a. At least three (3) degrees of freedom (longitudinal/Y, lateral/X, vertical/Z) b. Electrical and mechanical control of couch motion c. Couch weight limit (supporting patient weight): at least 220 kilograms d. Couch travel range: i. Lateral: $\pm 20\text{cm}$ ii. Vertical: at least -40cm iii. Longitudinal: at least +160cm e. Couch travel range accuracy: $\pm 2\text{mm}$ f. Couch capable of the following treatment techniques:			

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			i. Intensity Modulated Radiation Therapy (IMRT) ii. Image Guided Radiation Therapy (IGRT) iii. Volumetric Modulated Arc Therapy (VMAT)/RapidArc/Helical g. With controls for manual motion and emergency off buttons on both sides of the couch h. Carbon fiber material; free of metal and radiation-opaque materials i. Two (2) lock bars (ordinary and MRI compatible) 13. Treatment Delivery Technique Capability a. Field in Field b. IMRT c. IGRT d. VMAT/RapidArc/Helical 14. Imaging Technique Capability a. MV Cone Beam Computed Tomography (MV CBCT)			

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			b. kV Cone Beam Computed Tomography (kV CBCT) c. Includes couch mount for imaging <ul style="list-style-type: none"> <li>i. Adjustment for AP, lateral, and vertical movement</li> <li>ii. Locks for adjustments to ensure stability</li> </ul> 15. Control Console <ul style="list-style-type: none"> <li>a. The computerized control console, consisting of several workstations depending on the manufacturer.                             <ul style="list-style-type: none"> <li>i. All the functions and modes of the accelerator shall be software controlled.</li> <li>ii. Console shall provide controls that must be activated in order for the accelerator to become operational in any of its various modes of operation.</li> <li>iii. All modes and functions of the accelerator shall also be operated manually</li> </ul> </li> </ul>			

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					in figures	in words
			in case of any software malfunction. iv. There shall be UPS per computer system with at least 15-minute working time. b. Able to do auto-field sequencing integrated with oncology information system c. Integrated with oncology information system to display patient setup, treatment verification, and recording of treatment history into the OIS and file d. Integrated with oncology information system for imaging of treated fields before, during, and after the treatment for verification requirements e. Integrates use of the linear accelerator, MLC, MV imaging system, kV imaging system or separate workstations for MV imaging system and kV imaging system			

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	1		<b>C. Fully integrated MV CBCT Imaging System</b>			
			1. Maximum planar imaging size: at least 28 x 28 cm <sup>2</sup> 2. Active imaging area: at least 40 x 40 cm <sup>2</sup> 3. Image and treatment coincidence: ≤ 1.0mm 4. MV CBCT reconstructed volume length: at least 25 cm 5. MV CBCT scan diameter: at least 25 cm 6. MV CBCT spatial linearity accuracy: ± 0.5mm 7. Viewable Pixels: at least 1280 x 1280 8. Dose per MV CBCT acquisition: maximum of 5 MU 9. Hounsfield Uniformity: ±50 HU 10. Full integration with Oncology Information system, network and database. Should also be compatible with other (3rd party) oncology information systems. 11. Includes application software and acquisition workspace <ul style="list-style-type: none"> <li>a. Online and offline matching and image evaluation</li> <li>b. Match verification tools and image matching tools</li> </ul>			

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			(blend, color blend, spyglass window, split window)" 12. Able to do portal dosimetry to record intensity patterns of IMRT fields for pre-treatment quality assurance of IMRT planning and delivery a. Able to do continuous imaging in single, multiple or movie-loop mode b. Includes image analysis software for field fluence evaluation and analysis			
	1		<b>D. Fully integrated kV CBCT Imaging System</b>			
			1. Maximum reconstruction scan range: at least 38 cm 2. Maximum scan diameter: at least 48 cm 3. Spatial linearity accuracy: $\pm 0.5\text{mm}$ 4. Image and treatment coincidence: $\leq 1.0\text{mm}$ 5. Hounsfield Uniformity: $\pm 50\text{ HU}$ 6. Acquisition kV range: 80 kV - 140 kV 7. Acquisition exposure time range: 10 - 25 ms 8. kV Source/X Ray tube: Fan cooled x ray tube			

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			9. Has kV CBCT mode for different anatomical programs (i.e. Head, Breast, Thorax, Pelvis) 10. Ability to export images via DICOM for image analysis <ul style="list-style-type: none"> <li>a. OIS integration and connectivity (2D, 3D, and 4D systems)</li> <li>b. TPS configuration and connectivity (2D, 3D, and 4D systems)</li> </ul> 11. Imported DICOM image analysis and evaluation software includes: <ul style="list-style-type: none"> <li>a. Auto-matching tools</li> <li>b. Image match verification tools</li> <li>c. Other tools that measure distance and angles</li> </ul> 12. Images acquired from CBCT (cone beam computed tomography) can be used for adaptive treatment planning 13. Quality Assurance and calibration phantoms (as supplied by a third party) <ul style="list-style-type: none"> <li>a. Isocenter cube phantom                             <ul style="list-style-type: none"> <li>i. Composed of PMMA or material equivalent in density</li> </ul> </li> </ul>			

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			ii. At least 4 x 4 x 4 cm <sup>3</sup> in size b. Marker phantom to check for imaging-treatment isocenter coincidence for 2D and 3D imaging system or MV isocenter determination and kV system calibration (ball bearing, fiducial, or commercial device) c. Phantom to quantify uniformity, spatial resolution and contrast: <ul style="list-style-type: none"> <li>i. Contrast and spatial resolution 2D kV system; phantom with low-contrast and high contrast objects (such as Leeds Phantom)</li> <li>ii. Contrast 3D system: an appropriate volumetric image quality phantom (such as a CT phantom)</li> <li>iii. Volumetric Image Quality Phantom with the following modules:</li> </ul>			

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			1) geometry, sensitometry module 2) high resolution module with 1- to 30-line pairs per cm gauge 3) low contrast module with supra-slice and sub-slice contrast targets 4) wave ramp and bead module or wave insert 5) image uniformity module d. CBCT Phantom for the evaluation of the image quality of 3D CBCT, includes various inserts and can be used to measure different aspects of CBCT image quality			

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					in figures	in words
			i. CBCT body normalization phantom (polyurethane foam) ii. CBCT head normalization phantom (high density polyethylene foam) iii. CBCT geometry calibration phantom iv. CT image quality phantom			
			<b>E. Immobilization Devices</b>			
	1		1. Head, neck and shoulder devices			
	1		a. Baseplate			
	1		i. Standard angulation 1) Carbon fiber material 2) MRI compatible			
			ii. Tilting angulation: Carbon fiber material			
	30		b. Thermoplastic mask			
	20		i. Head and neck masks ii. Head, neck, and shoulder masks			
			c. Head rest			

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	6		i. Head rests, with standard sizes of A-F with comprehensive range of neck angulations			
	1		ii. Adult prone			
	1		iii. Pediatric sets			
	1		1) prone			
	1		2) supine			
			iv. No transmission correction needed for high energy beams			
	20		d. Bite Block			
	5		i. Standard bite blocks			
			ii. Large bite blocks			
	1		e. Shoulder retractor			
	2		2. Chest and breast immobilizer			
	2		a. Breast board; carbon fiber material			
			b. Wing board: carbon fiber material			
			c. Vacuum Cushion Immobilizer			
	10		i. Whole/full body			
	10		ii. Half body			
	1		iii. Vacuum/compressor pump			

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	20		iv. Breast Thermoplastic Mask compatible with the breast board and needed accessories as prescribed for use by the manufacturer			
	1		3. Abdomen and pelvis immobilizers			
	2		a. Belly board: carbon fiber material			
	20		b. Abdomen and pelvis immobilization system with abdomen and pelvis baseplate: carbon fiber material			
			c. Reinforced thermoplastics compatible with the abdomen and pelvis baseplate			
	1		4. Other devices			
	1		a. Patient transfer board			
	1		b. Tungsten eye shields			
	1		i. Pair of small			
	1		ii. Pair of medium			
			iii. Pair of large			
	1		c. Testicle shields			
	1		i. Small			
	1		ii. Medium			
	1		iii. Large			
	2		d. Patient restraint belts			

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	2		e. Calipers: stainless steel with parallel arms and calibrated in cm			
	1		f. Set of multipurpose support cushions and wedges			
			g. Bolus/tissue equivalent build up material, at least 30 cm x 30 cm			
	2		i. 0.5 cm thickness			
	2		ii. 1 cm thickness			
	2		iii. 1.5cm thickness			
			<b>F. Oncology Information System with Networking, Record and Verify System</b>			
	1		1. LINAC Server a. High storage capacity server that can store at least 10000 patients' data b. Monitor: not smaller than 20" LCD monitor c. Uninterrupted power supply with at least 15 minutes working capacity d. With appropriate port hubs and all necessary network connections as prescribed by the manufacturer e. To be placed in the proposed Treatment Planning Room			

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			f. Must be of the latest model and latest software version by the manufacturer.			
	3		2. Workstations a. To be placed at Treatment Control Room, CT Console at Brachytherapy Facility, and Consultation Room b. Processor: Current generation of at least Intel i5 c. Current generation chipset d. Memory: not smaller than 16GB, DDR4 RAM e. Has the current generation Intel HD graphics f. Has keyboard, mouse, and USB terminals g. Storage: not smaller than 1TB h. Optical drive DVD – writer i. Display 23” LED j. Has Wi-Fi card for wireless connectivity k. Must be of the latest model by the manufacturer. l. UPS with at least 15 minutes working time capacity for every workstation 3. OIS Software includes the following:			

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			a. Patient data administration and electronic medical record b. Independent treatment verification c. Treatment and port image review d. Time planner/scheduler e. Electronic patient RT chart f. Chart audit and checking/assessment g. Capable to archive and restore Patient data h. Must be of the latest software version by the manufacturer. 4. Provision for remote access to the distributor for remote service and diagnosis; including cabled high-speed internet connection.			
			<b>G. Treatment Planning System</b>			
			1. Contouring a. Supports contouring templates that list structures of interest b. Boolean operations (such as AND, OR, XOR, AND NOT) with structures to create			

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			complex structure definitions or equivalent contouring tools (margin, subtraction and addition) c. Advanced contouring tools with patient identity information should be available d. Automatic segmentation/contouring based on electron density values for different organs should be included 2. Image Registration a. Image registration support includes CT scan, MRI, and PET via DICOM b. Able to do image fusion c. Patient data acquisition through DICOM import facility from CT Scan, CBCT, MRI and PET 3. Planning, Dose Calculation, and Optimization a. Treatment planning for photon and electron beam of all energies in the therapeutic range b. Able to do treatment plans for conventional, 3D-			

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 ACCELERATOR SYSTEM WITH RELATED  
 SPECIALTY WORKS FOR THE PHILIPPINE  
 GENERAL HOSPITAL CANCER INSTITUTE**

Opening of Bids: **October 29, 2021**  
 ABC: **PHP230,000,000.00**

Contract: **SINGLE BID**

Item No.	Qty.	UOM	Item Description	Unit Cost	Quotations (all taxes included)	
					in figures	in words
			conformal, IMRT, VMAT/RapidArc/Helical (licenses to compute included) <ul style="list-style-type: none"> <li>i. IMRT Planning License: utilizing sliding window, large field, and step and shoot technique</li> <li>ii. VMAT/RapidArc/Helical Planning License with multi-arc fields capabilities</li> <li>c. Includes advanced dose calculation algorithms for Monte Carlo equivalent photon calculation (such as Monte Carlo, AcurosXB enhancement) and Monte Carlo algorithm for electron.</li> <li>d. Inverse planning software for IMRT and VMAT/RapidArc/Helical</li> <li>e. Can utilize graphics processing unit for plan optimization</li> <li>f. Capable of multi-criteria optimization</li> <li>g. Able to display target and critical structure motions</li> </ul>			

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					in figures	in words
			using 4D tools for respiratory-gated treatment plans for IMRT and VMAT/RapidArc/Helical <ul style="list-style-type: none"> <li>i. 4D image series are displayed as movie loops and as blended or blinking images</li> <li>ii. 4D image displays supports CT, PET/CT, PET and images from the kV imaging system attached to the machine</li> <li>h. Capable of adaptive treatment planning</li> <li>i. Support regular and irregular fields for all types of beam modifiers such as bolus, MLCs, tissue compensator, and asymmetric beam</li> <li>j. Capable of making tissue inhomogeneity correction (as per electron density), irregular point dose calculation and auto contouring as per CT data.</li> <li>k. Able to provide enhance organ at risks (OARs) and</li> </ul>			

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			target overlap and small structure management. 4. Plan Evaluation and Analysis a. Side by side plan comparison b. DVH for multiple plans in one plot, DVH for any multiple structure volumes in one plot c. Differential or cumulative dose volume histogram d. Absolute or relative scale for the structure volume axis of DVH plot e. Plan summation/subtraction for external beam plans, can store summed plans f. Electronic plan approval 5. Quality Assurance a. Able to do portal dosimetry calculation for VMAT/RapidArc/Helical and IMRT fields on electronic portal imaging device/MV system b. Supports In-Vivo Estimation Dosimetry for IMRT/VMAT/RapidArc/Helical treatment plans			

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	3		i. Capable of automatic accumulation and evaluation of recalculated daily delivered doses ii. Can qualitatively assess areas of over-dosing and under-dosing due to anatomical changes and imperfect set up iii. Can provide DVH comparison of actual delivered dose to planned delivered dose 6. System administration utilities including back-up, archive, and restore 7. Workstations a. Calculation workstation/treatment planning system with physics license and UPS with at least 15 minutes working time capacity for every workstation with licenses. With medical grade display not smaller than 23".			

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	5		b. Non calculation workstation/contouring station with contouring license and UPS with at least 15 minutes working time capacity for every workstation with licenses. With medical grade display not smaller than 23". c. Must be of the latest model and latest software version by the manufacturer.			
	1		8. Printers a. Heavy duty laser monochromatic printer with two (2) additional sets of ink			
	1		b. Heavy duty laser colored printer with two (2) additional sets of ink			
	1		9. Automated Plan Conversion If the machine is not of the same brand and model of the existing LINAC machine the following conditions shall be met: a. Winning bidder shall provide connectivity to the offered treatment planning system (TPS). It shall be			

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					in figures	in words
			connected to the existing OIS, and be able to store contoured DICOM images and convert or translate it to an acceptable file for treatment planning on the existing and new TPS storage capacity. b. Computer storage capacity shall be able to store at least 4000 patient treatment data. c. Performance of beam data gathering and commissioning of the existing LINAC machine shall comply with the beam data requirements of the new TPS to be done by the in-house medical physicist. d. Beam data gathering of the new LINAC machine shall comply with the beam data requirements of the existing TPS to be done by the in-house medical physicist. 10. Able to import/export patient image, contours, and plan data to/from the existing Treatment			

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					in figures	in words
			Planning System of the Division of Radiation of Oncology 11. Supports DICOM-RT import/export of at least DICOM images or higher and radiotherapy images, structures, plans, dose matrix, dose points, fluence, dMLC for IMRT, blocks, compensators, etc. 12. Import filters include image transfer via LAN, CD-ROM, film scanner, digitizer for non-CT based patients (brachytherapy films and irregular images) and dosimetric beam data from all brand name water phantoms (e.g. Sun Nuclear, IBA, PTW, etc.)			
			<b>H. LINAC Accessories</b>			
	1		Laser Alignment System for the LINAC Machine (Four Cross Laser System)			
			<b>I. Other requirements of the LINAC Machine</b>			
	1		1. Leaded door (borated polyethylene) for the LINAC bunker			

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					in figures	in words
	1		2. Set of patient intercom system in the treatment room and control console			
	1		3. CCTV Camera system: High resolution six (6)-piece camera system (two cameras for the main treatment area, one for the maze, 2 for the reception/waiting area, and one for the corridor) with three (3) views			
	1		4. Intercom in the Treatment Console shall be connected to the existing Intercom system (i.e. connection to Reception Area, CT Console Rooms (at LINAC and brachytherapy facilities), Treatment Planning Room)			
	1		5. Set of radiation warning lights above the LINAC room door connected to the treatment machine			
	2		6. Water chillers; specifications as prescribed by the manufacturer			
	1		7. Air compressor if required by the manufacturer; specifications as prescribed by the manufacturer			
	5		8. Dehumidifiers (three for the treatment room, one for the treatment planning room, and one for the equipment dosimetry room)			

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			a. 20 Liter capacity b. Wheel-mounted c. Automatic adjustable humidistat d. Water tank full indicator with auto shut-off e. Ozone friendly refrigerant, frost-free f. 100% CFC g. At least ¼ hp, 220-240 V			
			<b>J. Technical Specifications of the Dosimetry System</b>			
	1		1. Radiation Field Analyzer or Beam Scanner a. Advanced 3D computer-controlled radiation scanning system to measure dose distribution comprised of: i. 3D mechanics with scanning volume of not smaller than 40 cm x 65 cm x 330° ii. Calibrated high-precision mechanics with built-in levelling frame			

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					in figures	in words
			iii. Can fit inside the Linear Accelerator Bore iv. Calibrated high-precision mechanics with built-in leveling frame v. Water phantom carriage with electrically operated telescopic lift vi. Water reservoir carriage with bi-directional pump (fill and drain water) vii. Control unit with built in two channel electrometer and with TNC connector viii. Hand-held control			
	1		ix. Set of detector holders for use of Farmer, parallel plate and field/reference Ionization Chambers (IC)			
			b. Fast, accurate, simple and easy setup scanning system c. Storage case and dust cover			

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					in figures	in words
	1		2. Advanced acquisition and analysis software with laptop computer system <ul style="list-style-type: none"> <li>a. Support of all international and industry protocol (such as IAEA, AAPM, etc)</li> <li>b. Compatible with all commercial radiation treatment planning systems</li> <li>c. License for installation of the software on up to (3) three additional workstations</li> <li>d. Can measure electron and photon profiles, depth dose curves and TMR/TPR</li> <li>e. Flexible ASCII tables including export to MS Excel</li> <li>f. Capability for radiation treatment planning software specific measurement queue creation and data conversion to the treatment planning system</li> </ul>			
	1		3. Farmer Type Ion Chamber <ul style="list-style-type: none"> <li>a. Farmer type ionization chamber 0.6 cc with plastic walls, Co-60 build-up cap, waterproof and fully</li> </ul>			

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			guarded, calibrated in a standards laboratory in terms of absorbed dose to water b. Ionization chamber model must be included in IAEA TRS 277/382/398 protocols c. With ion chamber holder or adapter for absolute measurements in water phantom and existing check source			
	1  1 2		4. Ionization Chambers for Small Field Dosimetry a. Ion chambers with the following volume, cylindrical, waterproof and fully guarded: i. Not bigger than 0.015 cc Cavity Volume with graphite central electrode ii. Not bigger than 0.04 cc Cavity Volume iii. Not bigger than 0.125 cc Cavity Volume b. With ion chamber holder or adapter for absolute			

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			measurements in water phantom and existing check source			
	1		5. Therapy Dose Meter (Electrometer) <ul style="list-style-type: none"> <li>a. Must be compatible with the delivered ionization chambers, calibrated in a standards laboratory                             <ul style="list-style-type: none"> <li>i. Power supply is 220-240 V, stable and high accuracy in the measurements, with display of accumulated charge and dose, varying bias voltage with V1/V2 ratio equal or greater than 3, dose rate, exposure time, leakage and other important information that ensure validity of the instruments and with possibility of reverse polarity</li> </ul> </li> <li>b. With calibration certificate, electrometer technical and user manual</li> </ul>			

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			c. Complete with necessary accessories and carrying case			
	1  2		6. Detector Extension Cables a. Low noise triaxial cable on reel not shorter than 20 meters b. Low noise triaxial cable on reel not shorter than 10 meters c. Low radiation leakage cable and resistant against radiation damage			
	1		7. Barometer Digital, with selectable unit of pressure, 1 hPa or 0.5 mm Hg minimum scale, calibrated in a standard laboratory, with calibration certificate, technical data and user manuals in English			
	1		8. Thermometer Digital, with selectable unit of temperature, 0.5°C min scale calibrated in Standards Laboratory, with calibration certificate, technical data and user manual in English			

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	1		9. Hygrometer Digital calibrated in SI units in a Standards Laboratory, with calibration certificate, technical data and user manuals in English			
	1		10. Desiccator cabinet, at least 4 levels, with at least 114 Liters Capacity with humidity and temperature indicators and controls, calibrated to SI units, 220-240V			
	2		11. Radiotherapy Area Monitor a. Radiation area monitoring system installed inside the treatment room and at the control area b. Flashing red lights alarm with 180° field of view, with aural alarm switch ON/OFF and with battery back-up for at least 24 hours			
	100 100		12. Ready Pack radiotherapy verification films a. Size 20 x 20 cm2 b. Size 35 x 35 cm2			
	50		13. Gafchromic verification films: at least 35 x 35 cm2			

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	1		14. Digital level: magnetic horizontal, vertical and diagonal bubble level; durable			
	1		15. 4D Patient Plan Verification Dosimetry System a. For volumetric modulated RT patient treatment plan verification b. Matrix detector grid c. Able to do the following analyse: i. 2D dose analysis: compare data or absolute dose data using Distance to Agreement (DTA), Gamma (Y) and Gradient Compensation ii. Control point analysis (VMAT/RapidArc/Helical): individual control points and user-defined arc sections can be analyzed for a full arc or sub arc. iii. Equivalent VMAT/RapidArc/Hel			

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			ical Analysis system: verification of VMAT/RapidArc/Hel ical plans using densities of ROIs from a TPS to calculate SSD, geometric and effective depth automatically for VMAT/RapidArc/Hel ical and IMRT plans iv. MLC analysis: evaluate the difference between the planned and delivered MLC pattern d. Include detector array, compatible phantom and software capable of DVH QA analysis			
	1		16. Chamber matrix for measurement of radiotherapy beam a. Measure fields up to a size of at least 20 cm x 20 cm <sup>2</sup> b. Analysis parameters shall include dose output, flatness, symmetry, field size, light-radiation field			

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			coincidence, penumbra, dose rate and beam center			
	1		17. Radiation Survey Meter a. Battery-operated ionization radiation survey meter b. Digital, accurate, auto ranging, zeroing with warm up of less than 2 minutes c. Units of measurement are indicated at all times and capable of showing messages for unit operating conditions d. Radiation detected: alpha, beta, gamma and x-ray, 0-2 Sv/hr e. Calibrated in SI units f. With calibration certificates and user manual			
	1		18. Water phantom for absolute dose measurement a. One dimensional, stand-alone water phantom for absolute dose measurements according to IAEA TRS-398 dosimetry protocols			

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Item No.	Qty.	UOM	Item Description	Unit Cost	Quotations (all taxes included)	
					in figures	in words
			b. Minimum of 25cm x 35cm x 25cm volume, with PMMA wall c. With Farmer ion chamber and plane parallel plate chamber adapters and holding device on a vertical beam measurement for waterproof Farmer ion chamber and Parallel Plate Chamber d. The measurement depth can be manually adjusted with 0.1mm steps and read out on the incremental encoder with integrated digital display			
	1		19. Independent Monitor Units (MU) Check Software Software for accurate and independent verification of monitor units, dose, and overall validity of standard, IMRT, VMAT/RapidArc/Helical			
			<b>K. Accessories and Supporting Equipment</b>			
			1. Air Conditioning System			

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Proj. Ref. No.: **PUR21-07-0669**  
 End-User: **DIVISION OF RADIOLOGY**  
 Project: **SUPPLY, DELIVERY, INSTALLATION, TESTING,  
 AND COMMISSIONING OF BRAND-NEW LINEAR  
 ACCELERATOR SYSTEM WITH RELATED  
 SPECIALTY WORKS FOR THE PHILIPPINE  
 GENERAL HOSPITAL CANCER INSTITUTE**

Opening of Bids: **October 29, 2021**  
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Item No.	Qty.	UOM	Item Description	Unit Cost	Quotations (all taxes included)	
					in figures	in words
	3		a. Centralized Air Conditioning System (inverter-type) in all areas of the facility			
	1		b. Back-up Air Conditioning Units			
	2		i. 1.5 T Air Conditioning Unit			
	1		1) To be placed in the following rooms:			
			a. Treatment Planning Room & Server Room			
			b. Treatment Console			
			c. LINAC Bunker			
			d. Equipment Dosimetry Room			

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	2		e. Patient Waiting Area			
	2		2) Wall-mounted or ceiling-mounted 3) Inverter-type compressor			
	1		ii. 3T Air Conditioning Unit 1) To be placed in the LINAC Bunker 2) Ceiling-mounted or wall-mounted 3) Inverter-type compressor			
	1		iii. 2 HP Air Conditioning Unit to placed in Cancer Institute Room 104			
	1		2. Fire Extinguisher: a. To be placed in the following areas: i. LINAC Bunker ii. Treatment Console			
	1		b. Green Type HCFC			
	10		3. Fire Alarm & Detector:			

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	2		a. Battery-type and with audio alarm b. To be placed in areas as recommended by Bureau of Fire Protection			
	1		4. Foot Stools a. Stainless steel b. With skid-resistant rubber mat c. Two-step			
	10		5. Thermometer with Hygrometer (combined) for the LINAC Bunker a. Digital b. Wall-mounted c. Measurement range humidity: 5%-95% RH or better d. Measurement range temperature: 0°-55.0°C or better			
	4		6. Electrical Extension Cord a. Heavy duty 8 ft cord b. Provides protection from power surges, spikes and AC contamination c. At least four (4) surge-protected outlets 7. Emergency Lights: to be placed in areas as required by Bureau of Fire a. Heavy duty			

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					in figures	in words
			<ul style="list-style-type: none"> <li>b. Automatic</li> <li>c. LED type</li> <li>d. Fire-retardant casing</li> </ul>			
	1		8. Exhaust Fan			
	5		<ul style="list-style-type: none"> <li>a. To be placed in the LINAC bunker</li> <li>b. To be placed in areas recommended by the Hospital Infection Control Unit</li> </ul>			
	1		9. MRI-Compatible Wheeled Stretcher			
			<ul style="list-style-type: none"> <li>a. Manual backrest with 1 mm thick stainless-steel top</li> <li>b. Fixed height</li> <li>c. Rubber bumper on all sides</li> <li>d. Sliding side rails</li> <li>e. Fixed IV pole</li> <li>f. With two sets patient restraints</li> <li>g. Heavy duty 8" caster wheels with brakes and ball bearing</li> <li>h. Diagonal oxygen tank holder</li> </ul>			
	2		10. MRI-Compatible Wheelchair			
			<ul style="list-style-type: none"> <li>a. Non-ferrous wheelchair</li> <li>b. With IV pole and E-cylinder</li> </ul>			
	4		11. Computer Set Desktops			
			<ul style="list-style-type: none"> <li>a. Current generation i7 or higher</li> <li>b. Current generation chipset</li> </ul>			

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	1		c. Memory 16GB, DDR4 RAM or higher d. Intel HD graphics; keyboard, mouse, USB terminals e. Local Storage of at least 1 TB. Hard disk drive and solid-state drive are both acceptable f. Optical drive DVD – writer g. Has wifi card for wireless connectivity h. Monitor should be at least 21” LED i. Network interface 10/100/1000 MB ethernet j. Operating System: Current generation Windows Professional 64bit k. Microsoft Office lifetime license 12. Anesthesia Machine with Multiparameter Patient Monitor a. Anesthesia Machine i. Must have Three Gas Systems (O2, Med. Air and N2O) ii. Must have dual tubes (Macro and Micro) for each gas; Min oxygen flow for			

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			micro must be 50ml or below iii. With separate auxiliary outlet of oxygen with own flow meter for nasal cannula/face mask use iv. Must have auxiliary common gas outlet for non-rebreathing system (NRBS) v. Can provide nominal 21% concentration of oxygen in O2/N2O mixture (hypoxia guard proportioning system) vi. Must have at least two (2) Vaporizer Mounts: One (1) Isoflurane and One (1) Sevoflurane vaporizer compatible with the machine vii. Must be equipped with standard pin index yoke for gases (for oxygen only);			

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			May have yoke for N2O also viii. Must have reusable breathing circuit natural latex-free and autoclavable at 134°C for up to 10 mins. or settings prescribed by manufacturer ix. Breathing system must be fully integrated in the workstation x. One step bag-vent switch turns ventilator on/off xi. Adjustable pressure limiting valve with tactile indicator xii. Circuit volume of 2.6 L maximum including canister capable of low-flow anesthesia xiii. Easy to remove/no tools needed for assembly/disassembly of breathing system			

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			xiv. Quick-change CO2 absorber with water tap (CO2 cannister, 1500G or lower)			
			xv. Must have active gas scavenging system			
			xvi. Must be equipped with gas pressure gauges (pipeline & cylinder)			
			xvii. Must be equipped with oxygen flush valve			
			xviii. Re-usable breathing head corrugated tubings must have universal adaptors/coupling			
			xix. High-pressure tubings/adaptor/connector/coupling for pipeline gases: Machine side: DISS; Gas pipeline outlet side: Medstart/OxequipT M type or DISS			
			xx. Medical grade Electrical outlets with circuit breaker			

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					in figures	in words
			fuse in AM anesthesia machine base unit xxi. Anesthesia Machine Base Unit- standard for equipment model (trolley, drawers, mounts, electricals, pneumatics) b. Ventilator Specifications i. Operating Modes: 1) Volume Controlled Ventilation 2) Pressure Controlled Ventilation 3) Pressure Support 4) Synchronized Intermittent Mandatory Ventilation 5) Manual Ventilation 6) Spontaneous Breathing ii. Monitored Parameters			

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			1) Expired Volume 2) Expired Flow 3) Respiratory Rate 4) Airway Pressure with Pressure waveform display 5) Allows Alarm Management iii. Control Input Ranges: 1) Breathing Frequency (rate) 4 to 100 bpm (VCV, PCV) 2) Positive End Expiratory Pressure (PEEP) 0 to 20 cmH2O or OFF, 4 to 30 cm H2O. Up to 30 cm H2O PEEP is acceptable.			

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			3) Inspiration/Expiration Ratio (Ti:Te) 4:1 to 1:8 4) Pressure Limiting (Plimit) 10 to 100 cmH2O (hPa). 5) Tidal Volume (Vt) 20 to 1500 mL in Volume Control 6) Compliance Compensation on Delivered TV 7) Low-flow compensation iv. Other Requirements 1) Fresh Gas Decoupling or Dynamic Fresh Gas Compensation 2) One bellows for all patient range			

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	1		(neonate to adult) 3) Allows direct access to ventilator parameters c. Multiparameter Patient Monitor Specifications: i. Must be able to monitor the following basic parameters: 1) 5-lead ECG (with ST and arrhythmia analysis; ESU cable; lead wire set-grabber/squeeze/alligator clip or snap style) 2) SpO2 (reusable probes/sensors: 1 adult, 1 pedia, and 1 neonate) 3) NIBP (At least two (2) of the			

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			following cuff size must be provided: Adult, Large Adult, Thigh and Child/Infant 4) Temperature (2 reusable core/esophageal cable-probes - One (1) for adult and One (1) for pediatric patients 5) Respiration 6) Invasive Blood Pressure: At least 2 channels ii. Monitor: At least 19-inch high-resolution TFT LCD Color Display; 10-12 channels iii. Must be able to monitor the			

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			following advanced parameters: 1) IBP (at least 2 channels and 2 cables/machine each either Biosensor/Utah System transducer compatible) 2) End Tidal CO2. End tidal CO2 can be integrated into the anesthesia machine display through a gas analyzer module. iv. Other Required Module: 1) Neuromuscular Transmission (with adult and pediatric mechanosens			

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			ors for blockade monitoring modes: single twitch, TOF, DBS, tetanus, PTC; nerve localization mode with electrosensor optional). Stand-alone NMT module is also acceptable. v. Other accessories for the cardiac monitor: 1) Auto volts (100-240 V) 2) Back-up rechargeable battery for at least one (1) hour 3) One (1) unit AVR appropriate for the machine (Third Party)			

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			4) Resistant to AC and high-frequency electro surgical interference from devices (e.g. cautery, defibrillators, etc.) 5) Capable of displaying all parameter information (waveform and numeric values) with high-capacity data storage for review 6) With visual and audible (at least 3-level) alarms that can be set by the user 7) Control via capacitive touchscreen			

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	1		8) Monitors network-ready (wired/wireless)			
	30		9) Multiparameter monitor must be compatible and connected to the anesthesia machine with mount			
			13. Stretcher			
			a. length: 2000 mm at least			
			b. width: 550 mm at least			
			c. lightweight with IV stand and collapsible railing			
			d. working load: at least 160 kg			
			14. Office chairs			
			a. Ergonomic			
			b. Adjustable arms			
			c. Pneumatic seat height adjustmant			
			d. Built-in lumbar support			
			e. Seat swivel			
			f. Weight rated up to 250 lbs			
			15. Stool bar chair			

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			a. Cushioned seat b. Armless c. Pneumatic seat height adjustment d. Weight rated up to 250 lbs.			
			<b>L. Provision for Future Remote Access to OIS and TPS</b>			
			Provision for future remote access to the Oncology Information System and Treatment Planning System with full functionality from any location on multiple devices for 25 users, as provided by a third-party supplier authorized by the distributor, in accordance with the Republic Act 10173/Data Privacy Act			
			<b>M. Commissioning of the Linear Accelerator</b>			
			To be reckoned after the winning bidder has issued the acceptance certificate indicating that all applicable and required tests have been satisfactorily met.			
<b>Total Approved Budget for the Contract:</b>				<b>Php230,000,000.00</b>		

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**TERMS & CONDITIONS:**

- A. The lifespan of the Linear Accelerator power source must be least three (3) years. If a lifespan of less than three (3) years, the power source should be replaced without additional cost to the institution in case of failure.**
- B. Compatibility with the existing machines and equipment of Division of Radiation Oncology Department of Radiology**
1. Couch  
Fully compatible with the existing immobilization devices and accessories
  2. Immobilization Devices  
Lock bars must be compatible with all immobilization devices, the treatment couch, and the CT simulator couch
  3. Dosimetry System  
All chambers and electrometer must be of the same connector design with the existing dosimetry system
- C. Connectivity with the existing machines and equipment of Division of Radiation Oncology Department of Radiology**
1. Oncology Information System:
    - a. Should be connected to the IGRT device and to should be able to import MV, kV, and volumetric DICOM images
    - b. Able to accept and read DICOM CT images from the existing 16 Slice Somatom Emotion of Radiation Oncology Division of UP-PGH from external devices (such as CD, DVD, or Flash Drive)
    - c. Should be connected to the purchased linear accelerator (to verify that the machine is set up according to plan and automatically records actual set-up parameters)
    - d. Should be connected the treatment planning system
    - e. Should be connected with the existing OIS of the LINAC at CI

Approved by:  
~Sgd.~

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**Dean LEONARDO R. ESTACIO, JR., PhD**  
Chairperson

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(Signature over Printed Name of President / Gen. Manager)

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(Name & Address of Company)

Proj. Ref. No.: PUR21-07-0669  
End-User: DIVISION OF RADIOLOGY  
Project: SUPPLY, DELIVERY, INSTALLATION, TESTING,  
AND COMMISSIONING OF BRAND-NEW LINEAR  
ACCELERATOR SYSTEM WITH RELATED  
SPECIALTY WORKS FOR THE PHILIPPINE  
GENERAL HOSPITAL CANCER INSTITUTE

Opening of Bids: **October 29, 2021**  
ABC: PHP**230,000,000.00**

Contract: SINGLE BID

2. Treatment Planning System
  - a. Workstations integrated to the LINAC console through the OIS network/record and verify system

**D. Requirements to be submitted by the bidder for bid opening:**

1. Brochures and Technical Specifications for the following:
  - a. Linear Accelerator Machine
  - b. Fully integrated MV CBCT Imaging System
  - c. Fully integrated kV CBCT Imaging System
  - d. Immobilization Devices
  - e. Oncology Information System with Networking, Record and Verify System
  - f. Treatment Planning System
2. SEC registration to prove that the supplier is in the business of importing and supplying medical equipment for the past 10 years
3. Certification that the manufacturer has been in the business of manufacturing Linear Accelerator Machines for at least 20 years.
4. Certified true copy of the Certificate of Distributorship for the last 5 years. The principal and the local distributor must have been in business partnership for the past 5 years.
5. Guarantee letter from the manufacturer and local distributor to ensure availability of supplies, parts and accessories for at least ten (10) years after expiration of the warranty period.
6. Certification by the principal that service engineers are factory trained on service and repair.
7. Certification by the supplier that at least one service engineer is available locally to provide quick on-site support.
8. Manufacturer's Office in the USA, Canada, Western Europe, and Japan
9. Must submit service record history indicating 95% uptime for the past 5 years from any Tertiary government or private hospital in the Philippines.

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10. Must submit at least three (3) certificates of Performance Evaluation with a rating of at least Very Satisfactory within the past ten (10) years from any Tertiary government or private hospital in the Philippines.
11. Submit a service record history indicating 95% uptime for the last five (5) years from any Tertiary government or private hospital in the Philippines.
12. Required Licenses of Certification: License from the Department of Health - Food and Drug Administration - Center for Device Regulation, Radiation Health and Research (DOH-FDA-CDRRHR)
13. Certification issued by the equipment manufacturer that the medical LINAC in its present condition is compliant with the performance and safety requirements of the International Atomic Energy Agency and the International Organization for Standardization/International Electrotechnical Commission (ISO/IEC)
14. Notarized affidavit of Site Inspection

**E. Requirements to be submitted by the bidder for bid opening:**

Product presentation in an institution with the same brand and model of the following:

1. Technical Specifications of the Linear Accelerator Machine
2. Fully integrated MV CBCT Imaging System
3. Fully integrated kV CBCT Imaging System
4. Treatment Planning System
5. Immobilization Devices
6. Oncology Information System with Networking, Record and Verify System

**F. Requirement/s if awarded the contract**

1. Project Completion date: Delivery, installation, testing and commissioning of the Linear Accelerator Machine and accessories, including design and construction of related infrastructure work in Five hundred (500) calendar days upon receipt of the Notice to Proceed.

Approved by:  
~Sgd.~

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**Dean LEONARDO R. ESTACIO, JR., PhD**  
Chairperson

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An extension shall be allowed, equivalent to the number of calendar days between the submission of the Architectural and Engineering Design Proposal and its approval by the in-house certified radiation oncology medical physicist, the OETS, the Chair of the Department of Radiology, the Deputy Director for Administration, and the Director.

2. Delivery Place: Philippine General Hospital, Taft Avenue, Manila
3. Installation Place: Cancer Institute, Philippine General Hospital
4. Warranty  
At least five (5) year warranty on all parts and service of all equipment purchased (to start after the performance and acceptance testing), as follows:
  - a. Linear Accelerator (LINAC) Machine including:
    - i. Radiation Oncology Information System (OIS)
    - ii. Treatment Planning System
    - iii. Immobilization Equipment
    - iv. LINAC Accessories
  - b. Dosimetry Equipment and Accessories Complete set of Dosimetry System
  - c. Guarantee for availability of after sales service and spare parts for ten (10) years after warranty period
  - d. LINAC MACHINE
    - i. Maximum downtime of twenty-four (24) working days in a year and not exceeding two days in a month; with corresponding penalty for delays (Php 200,000.00/day – based on approximate equivalent daily income of 50 IMRT patients using a computed rate of Php 4,000), which shall be compensated by extending the warranty equivalent to the amount computed from the accumulated downtime exceeding the maximum duration stated above.
    - ii. Definition of Machine Downtime: Start of downtime: once reported to the winning bidder - End of downtime: once the winning bidder has given clearance to resume operations

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- e. Warranty period shall commence from the date of acceptance by the end-user after installation, acceptance testing and commissioning of the of the LINAC machine, LINAC accessories, and treatment planning system.
5. Manuals of all equipment and accessories: The supplier must provide original hard copy and soft copy of operators and service manuals in English Language upon delivery.
6. Requirements on Dosimetry System
  - a. Calibration certificates and technical specifications of all dosimetry equipment, including survey meters and ionization chambers
  - b. All dosimeters for absolute dosimetry must be included in IAEA TRS 277/382/398 protocols
7. Users' Training  
Users' training for Radiotherapy Personnel on all unit systems delivered by the supplier's foreign physicists and application specialists, which include the following:
  - a. Data gathering and encoding/uploading of data to the TPS to be done by the in-house medical physicists shall be guided by the unit manufacturer application specialist/physicist.
  - b. Manufacturer application specialists/physicists who can speak English fluently. The in-house medical physicist reserves the right to refuse the presence of manufacturer's physicist if he/she cannot be understood. The supplier is obliged to send another one.
  - c. Notarized undertaking from the supplier that they will provide training for five (5) radiation oncologists and two (2) medical physicists in USA, Canada, Western Europe for at least 3 days; training/s shall be provided no later than the duration of the warranty period. Permit to travel and to conduct training must be approved by public health officials of both countries.
  - d. Four months training for four (4) radiologic technologists in a radiation therapy facility with the same or higher model and capabilities of the equipment purchased; if the same or higher model is not available in the country, the

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Applications Specialist should be present and assist during the first month of actual clinical operations.

- e. Training of radiologic technologists should be conducted before the acceptance of the machine.
- f. One (1) hospital engineer (on-site) to be provided before the acceptance testing of the purchased equipment.
- g. Two-week on-site applications training for the Radiology Staff and OETS Technical Personnel.
8. Quotation of the Annual Preventive Maintenance Cost after the warranty period expires shall be provided.
9. Supplier will indicate brand, model, country of origin, and manufacturing date of the all equipment to be delivered.
10. All equipment and accessories to be delivered and to be supplied must be of the latest model by the manufacturer. All software must be of the latest version by the manufacturer.
11. One manufacturer application specialist/physicist assistance for one month during the commissioning.
12. Free upgrades of all software (i.e. console version, TPS version) shall be included in the preventive maintenance of the machine by the supplier.

### **G. Acceptance Parameters**

1. Passed the performance testing of Department of Health - Food and Drug Administration - Center for Device Regulation, Radiation Health and Research (DOH-FDA-CDRRHR)
2. Licensing
  - a. Satisfactorily complied with licensing requirements of the Department of Health - Food and Drug Administration - Center for Device Regulation, Radiation Health and Research (DOH-FDA-CDRRHR)
  - b. To be reckoned upon issuance of commissioning report by the PGH in-house certified Radiation Oncology Medical Physicist.

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3. Initial Clinical Use:

- a. To be reckoned upon receipt of the license to operate issued by the Department of Health - Food and Drug Administration - Center for Device Regulation, Radiation Health and Research (DOH-FDA-CDRRHR)
- b. Completed treatment of the following:
  - i. At least six (6) IMRT procedures
  - ii. At least six (6) VMAT/RapidArc/Helical procedures
- c. Duration: 30 calendar days

**H. For infrastructure projects, the following maybe required as applicable:**

1. PCAB License (as applicable to the projects)
2. Bill of Quantities/Materials (as applicable)

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