CONTRACT FOR

SUPPLY, INSTALL, TEST, TRAIN AND COMMISSION

OF MEDICAL EQUIPMENT

(CT SCAN MACHINE FOR TUMBI RRH)

BETWEEN

TUMBI REGIONAL REFERRAL HOSPITAL

AND

PACIFIC DIAGNOSTICS LIMITED

Form of Agreement

THIS AGREEMENT is made the 11 day of 3, 2022 Between TUMBI REGIONAL REFERALL HOSPITAL, a Regional Referral Hospital established under the Ministry of Health of Tanzania and having its principal place of business at Kibaha, Pwani, P.O Box 30041, PWANI (hereinafter called "the Employer"), and PACIFIC DIAGNOSTICS LIMITED, a corporation incorporated under the laws of Tanzania and having its principal place of business at Plot 46- 48, Mikocheni Industrial Area, Opposite Coca-cola Kwanza Factory Dar es Salaam, Tanzania., P.O Box 34056, *Dar Es Salaam* (hereinafter called "the Contractor").

WHEREAS the Employer desires to engage the Contractor to Supply, Install, Test, Train and Commission of Medical Equipments (CT scan for Tumbi RRH) ("the Facilities") Tender No PA/009/2021-22/HQ/G/06 LOT 15 and the Contractor have agreed to such engagement upon and subject to the terms and conditions hereinafter appearing.
NOW IT IS HEREBY AGREED as follows:

Article 1. Contract Documents

1.1 Contract Documents
The following documents shall constitute the Contract between the Employer and the Contractor, and each shall be read and construed as an integral part of the Contract:

(a) This form of Agreement
(b) Special Conditions of Contract
(c) General Conditions of Contract
(d) Letter of Acceptance
(e) Technical Specifications
(f) Form of Tender and Price Schedules submitted by the Contractor
(g) Negotiation Minutes
(h) Power of Attorney

1.2 Order of Precedence (Reference GCC 2)
In the event of any ambiguity or conflict between the Contract Documents listed above, the order of precedence shall be the order in which the Contract Documents are listed in Article 1.1 (Contract Documents) above.

1.3 Definitions(Reference GCC 1)
Capitalized words and phrases used herein shall have the same meanings as are ascribed to them in the General Conditions of Contract.

Article 2. Contract

2.1 Contract Price(Reference GCC 11)
The Employer hereby agrees to pay to the Contractor

Price and Terms of Payment

the Contract Price in consideration of the performance by the Contractor of its obligations hereunder. The Contract Price shall be the aggregate of: Tshs 1,850,000,000.00 (Tanzanian Shillings one Billion Eighty Hundred Fifty Million Only) VAT Exclusive as per virtue of Item 14 of Part B of the Fifth Schedule to the East African Community Customs Management Act, 2004 and Item 7 of Part I of the exemption Schedule to the VAT Act, 2014 as specified in Price Schedule No. 5 (Grand Summary) or such other sums as may be determined in accordance with the terms and conditions of the Contract.

2.2 Terms of Payment(Reference GCC 12)

The terms and procedures of payment according to which the Employer will reimburse the Contractor are given in the corresponding Appendix (Terms and Procedures of Payment) hereto.

The Employer shall instruct its bank to issue an irrevocable confirmed documentary credit made available to the Contractor in a bank in the country of the Contractor.

In the event that the amount payable under Schedule No. 1 is adjusted in accordance with GCC 11.2 or with any of the other terms of the Contract, the Employer shall arrange for the documentary credit to be amended accordingly.

Article 3. Effective Date for Determining Time for Completion

3.1 Effective Date(Reference GCC 1)

The Time of Completion of the Facilities shall be determined from the date when all of the following conditions have been fulfilled:

(a) This Contract Agreement has been duly executed for and on behalf of the Employer and the Contractor;

(b) The Contractor has submitted to the Employer the performance security and the advance payment guarantee;

(c) The Employer has paid the Contractor the advance payment

(d) The Contractor has been advised that the documentary credit referred to in Article 2.2 above has been issued in its favor.

Each party shall use its best efforts to fulfil the above conditions for which it is responsible as soon as practicable.

3.2 If the conditions listed under 3.1 are not fulfilled within two (2) months from the date of this Contract notification because of reasons not attributable to the Contractor, the parties shall discuss and agree on an equitable adjustment to the Contract Price and the Time for

Completion and/or other relevant conditions of the Contract.

Article 4. Appendixes

4.1 The Appendixes listed in the attached List of Appendixes shall be deemed to form an integral part of this Contract Agreement.

4.2 Reference in the Contract to any Appendix shall mean the Appendixes attached hereto, and the Contract shall be read and construed accordingly.

IN WITNESS WHEREOF the Employer and the Contractor have caused this Agreement to be duly executed by their duly authorized representatives the day and year first above written.

For and on behalf of ***TUMBI REGIONAL REFERRAL HOSPITAL***

Name DR. AMANI K. MALIMA

Designation MOI

Signature

[Authorized Representative]

Witness LIDA HITLANI MBWILO

Qualification ADVOCATE

Signature & Stamp

Date 11/3/2022

LIDA HITLANI MBWILO
Advocate, Notary Public & Commissioner for Oaths
TEL: 0754 285 548

For and on behalf of ***PACIFIC DIAGNOSTICS LIMITED***

Name NERFAS PHILIP

Designation C.E.O

Signature

[Authorized Representative]

Witness NELLIE BAGIRA

Qualification TENDER OFFICER

Signature & Stamp

Date 11/3/2022

PACIFIC DIAGNOSTICS LIMITED
P. O. Box 34056
DAR-ES-SALAAM

SPECIAL CONDITIONS OF CONTRACT

Special Conditions of Contract

The following Special Conditions of Contract (SCC) shall supplement the General Conditions of Contract (GCC). Whenever there is a conflict, the provisions herein shall prevail over those in the GCC. The corresponding clause number of the GCC is indicated in parentheses.

SCC Clause Number	GCC Clause Number	Amendments of, and Supplements to, Clauses in the GCC
		Definitions (GCC 1)
1.	1.1	The Employer is: *Tumbi Regional Referral Hospital* The Project Manager is: *Will be appointed later in accordance with the GCC Clause 18.1* The Contractor is: *Pacific Diagnostics Limited* The Contractor's Representative is: *Naftal Philip* The Appointing Authority of the Adjudicator is: ***TANZANIA INSTITUTE OF ARBITRATORS.*** Country of Origin: all countries and territories as indicated in the section of the Tendering Documents, Eligibility for the Provision of Goods, Works and Services. Time for Completion: *Within Two Months (14th March, 2022 to 14th May, 2022).* Time for Completion for all Facilities: *Within Two Months (14th March, 2022 to 14th May, 2022).*
		Notices (GCC Clause 4)
2.	4.1	Employer's address for notice purposes: Medical Officer In-charge, Tumbi Regional Referral Hospital, P.O Box 30041, Kibaha - Pwani. Contractor's address for notice purposes: Managing Director Pacific Diagnostics Limited, P.O Box 34056, Dar es Salaam, Tanzania

Governing Law (GCC 5)		
3.	5.1	GCC 5.1—The Contract shall be interpreted in accordance with the Laws of Tanzania. The language of the Contract shall be English.
Settlement of Disputes (GCC 6)		
4	6.4	Rules of procedure for arbitration proceedings: Any dispute, controversy or claim arising out of or relating to this Contract, or breach, termination or invalidity thereof, shall be settled by arbitration in accordance with the Arbitration procedure published by the Tanzania Institute of Arbitrators.
5	6.3	Time for Referring a dispute for arbitration is 7 days
6	6.4	Place for Carrying out Arbitration is Dar es Salaam.
Scope of Facilities *[Spare Parts]* (GCC Clause 7)		
7.	9.3	The Contractor agrees to supply spare parts for a period of (Five) 5 years:
8.	9.3	The Contractor shall carry sufficient inventories to ensure an ex-stock supply of consumable spares for the goods. Other spare parts and components shall be supplied as promptly as possible, but at the most within six (6) months of placing the order and opening the letter of credit. In addition, in the event of termination of the production of spare parts, advance notification will be made to the Employer of the pending termination, with sufficient time to permit the Employer to procure the needed requirement. Following such termination, the Contractor will furnish to the extent possible and at no cost to the Employer the blueprints, drawings and specifications of the spare parts, if requested.
Time for Commencement and Completion (GCC 10)		
9.	10.1	The Contractor shall commence work on the Facilities from the Effective Date for determining Time for Completion as specified in the Contract Agreement.
10.	10.2	The Completion of the Facilities shall be attained Within Two Months *(14th March, 2022 to 14th May, 2022).*
Contract Price (GCC Clause 12)		
11.	12.2	The Contract Price shall be adjusted in accordance with the provisions of the corresponding Appendix (Price Adjustment) to the Contract Agreement *[to be inserted **only** if Contract Price is subject to adjustment]*. N/A

Securities (GCC 14)		
12.	14.3.1	The amount of performance security, as a percentage of the Contract Price for the Facility or for the part of the Facility for which a separate time for Completion is provided, shall be: *Ten percent **(10%)*** of contract price.
13.	14.3.2	The performance security shall be in the form of the *Unconditional Bank Guarantee or Surety Bond* attached hereto in the section on Sample Forms and Procedures.
14.	14.3.5	The performance security shall be reduced to ten eight (8%) of the value of the component covered by the extended warranty to cover the Contractor's extended warranty in accordance with the provision in the SCC, pursuant to GCC 28.10
Work Programme (GCC 19)		
15	19.2	The form of the programme of performance of the Contract shall be: *in the form of the critical path method (CPM).*
Commissioning and Operational Acceptance (GCC 26)		
16	26.2.2	The Guarantee Test of the Facilities shall be successfully completed within 1 week (one)from the date of Completion.
Completion Time Guarantee (GCC Clause 27)		
17	27.2	Applicable rate for liquidated damages: 0.1 percent per day. Maximum deduction for liquidated damages: is equal to the Performance Security quoted.
18	27.3	Applicable for the bonus for early Completion: No bonus will be given for earlier Completion of the Facilities or part thereof.
Defect Liability (GCC 28)		
19	28.10	The critical components covered under the extended warranty are *all components under this contract*, and the period shall be *five (5) years*.
Completion—Guarantee Test—Acceptance (GCC 25.3 and 26.2)		
20	25.3 and 26.2	21.1 In the event that the Contractor is unable to proceed with the Pre-commissioning of the Facilities pursuant to GCC 25.3, or with the Guarantee Test pursuant to

		GCC 26.2, for reasons attributable to the Employer either on account of non-availability of other facilities under the responsibilities of other contractor(s), or for reasons beyond the Employer's control, the provisions leading to "deemed" completion of activities such as Completion, pursuant to GCC 25.6, and Operational Acceptance, pursuant to GCC 26.3.4, and Contractor's obligations regarding Defect Liability Period, pursuant to GCC 28.2, Functional Guarantee, pursuant to GCC 29, and Care of Facilities, pursuant to GCC 33, and GCC 42.1, Suspension, shall not apply. In this case, the following provisions shall apply. 21.2 When the Contractor is notified by the Project Manager that he will be unable to proceed with the activities and obligations pursuant to above GCC 14.1, the Contractor shall be entitled to the following: (a) the Time of Completion shall be extended for the period of suspension without imposition of liquidated damages pursuant to GCC 27.2; (b) payments due to the Contractor in accordance with the provision specified in the corresponding Appendix (Terms and Procedures of Payment) to the Contract Agreement, which would not have been payable in normal circumstances due to non-completion of the subject activities, shall be released to the Contractor against submission of a security in the form of a bank guarantee of equivalent amount acceptable to the Employer, and which shall become null and void when the Contractor will have complied with its obligations regarding those payments, subject to the provision of GCC 14.3 below; (c) the expenses towards the above security and extension of other securities under the contract, of which validity needs to be extended, shall be reimbursed to the Contractor by the Employer; (d) the additional charges towards the care of the Facilities pursuant to GCC 33.1 shall be reimbursed to the Contractor by the Employer for the period between the notification mentioned above and the notification mentioned in GCC 14.4 below. The provision of GCC 34.2 shall apply to the Facilities during the same period. 21.3In the event that the period of suspension under

		above GCC 14.1 actually exceeds one hundred eighty (180) days, the Employer and Contractor shall mutually agree to any additional compensation payable to the Contractor. 21.4When the Contractor is notified by the Project Manager that the plant is ready for Pre-commissioning, the Contractor shall proceed without delay in performing all the specified activities and obligations under the contract.

GENERAL CONDITIONS OF CONTRACT

A. Contract and Interpretation

1	Definitions	1.1	The following words and expressions shall have the meanings hereby assigned to them: "Contract" means the Agreement entered into between the Employer and the Contractor, together with the Contract Documents referred to therein; they shall constitute the Contract, and the term "the Contract" shall in all such documents be construed accordingly. "Contract Documents" means the documents listed in Article 1.1 (Contract Documents) of the Form of Agreement (including any amendments thereto). "GCC" means the General Conditions of Contract hereof. "SCC" means the Special Conditions of Contract. "Day" means calendar day. "Month" means calendar month. "Employer" means the person named as such in the SCC and includes the legal successors or permitted assigns of the Employer. "Project Manager" means the person appointed by the Employer in the manner provided in GCC 18.1 (Project Manager) hereof and named as such in the SCC to perform the duties delegated by the Employer. "Contractor" means the person(s) whose tender to perform the Contract has been accepted by the Employer and is named as such in the Agreement, and includes the legal successors or permitted assigns of the Contractor. "Contractor's Representative" means any person nominated by the Contractor and named as such in the SCC and approved by the Employer in the manner provided in GCC 18.2 (Contractor's Representative and Construction Manager) hereof to perform the duties delegated

			by the Contractor. "Subcontractor," including vendors, means any person to whom execution of any part of the Facilities, including preparation of any design or supply of any Goods, is sub-contracted directly or indirectly by the Contractor, and includes its legal successors or permitted assigns. "Adjudicator" means the person or persons appointed by the Appointing Authority named in the SCC to make a decision on or to settle any dispute or differences between the Employer and the Contractor referred to him or her by the parties pursuant to GCC 6.1 (Adjudicator) hereof. "Contract Price" means the sum specified in Article 2.1 (Contract Price) of the Agreement, subject to such additions and adjustments thereto or deductions there from, as may be made pursuant to the Contract. "Facilities" means the Goods to be supplied and installed, as well as all the Installation Services to be carried out by the Contractor under the Contract. "Force Majeure" shall mean any event beyond the reasonable control of the Employer or of the Contractor, as the case may be, and which is unavoidable notwithstanding the reasonable care of the party affected. "Goods" means permanent plant, equipment, machinery, apparatus, articles and things of all kinds to be provided and incorporated in the Facilities by the Contractor under the Contract (including the spare parts to be supplied by the Contractor under GCC 7.3 hereof), but does not include Contractor's Equipment. "Installation Services" means all those services ancillary to the supply of the Goods for the Facilities, to be provided by the Contractor under the Contract; e.g., transportation and provision of marine or other similar insurance, inspection, expediting, site preparation works (including the provision and use of Contractor's Equipment and the supply of all construction

			materials required), installation, testing, pre-commissioning, commissioning, operations, maintenance, the provision of operations and maintenance manuals, training, etc. "Contractor's Equipment" means all plant, facilities, equipment, machinery, tools, apparatus, appliances or things of every kind required in or for installation, completion and maintenance of Facilities that are to be provided by the Contractor, but does not include Goods, or other things intended to form or forming part of the Facilities. "Country of Origin" means the countries and territories eligible under the PPA 2004 and its corresponding Regulations as further elaborated in the SCC. "Site" means the land and other places upon which the Facilities are to be installed, and such other land or places as may be specified in the Contract as forming part of the Site. "Effective Date" means the date of fulfillment of all conditions stated in Article 3 (Effective Date for Determining Time for Completion) of the Form of Agreement, for the purpose of determining the Time for Completion. "Time for Completion" means the time within which Completion of the Facilities as a whole (or of a part of the Facilities where a separate Time for Completion of such part has been prescribed) is to be attained in accordance with the specifications in the SCC and the relevant provisions of the Contract. "Completion" means that the Facilities (or a specific part thereof where specific parts are specified in the SCC) have been completed operationally and structurally and put in a tight and clean condition, and that all work in respect of Pre-commissioning of the Facilities or such specific part thereof has been completed; in other words, that the Facilities or specific part thereof are ready for Commissioning as provided in GCC 25 (Completion) hereof. "Pre-commissioning" means the testing,

			checking and other requirements specified in the Technical Specifications that are to be carried out by the Contractor in preparation for Commissioning as provided in GCC 25 (Completion) hereof. "Commissioning" means operation of the Facilities or any part thereof by the Contractor following Completion, which operation is to be carried out by the Contractor as provided in GCC 26.1 (Commissioning) hereof, for the purpose of carrying out Guarantee Test(s). "Guarantee Test(s)" means the test(s) specified in the Technical Specifications to be carried out to ascertain whether the Facilities or a specified part thereof is able to attain the Functional Guarantees specified in the Technical Specifications in accordance with the provisions of GCC 26.2 (Guarantee Test) hereof. "Operational Acceptance" means the acceptance by the Employer of the Facilities (or any part of the Facilities where the Contract provides for acceptance of the Facilities in parts), which certifies the Contractor's fulfillment of the Contract in respect of Functional Guarantees of the Facilities (or the relevant part thereof) in accordance with the provisions of GCC 29 (Functional Guarantees) hereof and shall include deemed acceptance in accordance with GCC 26 (Commissioning and Operational Acceptance) hereof. "Defect Liability Period" means the period of validity of the warranties given by the Contractor commencing at Completion of the Facilities or a part thereof, during which the Contractor is responsible for defects with respect to the Facilities (or the relevant part thereof) as provided in GCC 28 (Defect Liability) hereof.
2	Interpretation order of Documents	2.1	In interpreting these Conditions of Contract headings and marginal notes are used for convenience only and shall not affect their interpretations unless specifically stated; references to singular include the plural and vice versa; and masculine include the feminine. Words have their ordinary meaning under the language of the Contract unless specifically defined.

		2.2	If any of the Contract Documents, correspondence or communications are prepared in any language other than the governing language under GCC 2.1 above, the English translation of such documents, correspondence or communications shall prevail in matters of interpretation.
		2.3	The documents forming the Contract shall be interpreted in the following order of priority: (1) Form of Agreement, (2) Special Conditions of Contract, (3) Conditions of Contract, (4) Letter of Acceptance, (5) Certificate of Contract Commencement (6) Specifications, (7) Drawings, (8) Bill of Quantities, (9) Contractor's Tender, and Any other document listed in the Special Conditions of Contract as forming part of the Contract.
		2.4	Persons Words importing persons or parties shall include firms, corporations and government entities.
		2.5	Incoterms Unless inconsistent with any provision of the Contract, the meaning of any trade term and the rights and obligations of parties there under shall be as prescribed by *Incoterms*. *Incoterms* means international rules for interpreting trade terms published by the International Chamber of Commerce (latest edition), 38 Cours Albert 1er, 75008 Paris, France.
		2.6	Entire Agreement Subject to GCC 17.4 hereof, the Contract constitutes the entire agreement between the Employer and Contractor with respect to the subject matter of Contract and supersedes all communications, negotiations and agreements (whether written or oral) of parties with respect thereto made prior to the date of Contract.

		2.7	Amendment No amendment or other variation of the Contract shall be effective unless it is in writing, is dated, expressly refers to the Contract, and is signed by a duly authorized representative of each party hereto.
		2.8	Independent Contractor The Contractor shall be an independent contractor performing the Contract. The Contract does not create any agency, partnership, joint venture or other joint relationship between the parties hereto. Subject to the provisions of the Contract, the Contractor shall be solely responsible for the manner in which the Contract is performed. All employees, representatives or Subcontractors engaged by the Contractor in connection with the performance of the Contract shall be under the complete control of the Contractor and shall not be deemed to be employees of the Employer, and nothing contained in the Contract or in any subcontract awarded by the Contractor shall be construed to create any contractual relationship between any such employees, representatives or Subcontractors and the Employer.
		2.9	Joint Venture or Consortium If the Contractor is a joint venture or consortium of two or more persons, all such firms shall be jointly and severally bound to the Employer for the fulfillment of the provisions of the Contract and shall designate one of such persons to act as a leader with authority to bind the joint venture or consortium. The composition or the constitution of the joint venture or consortium shall not be altered without the prior consent of the Employer.
		2.10	Non-Waiver 2.10.1 Subject to GCC 2.10.2 below, no relaxation, forbearance, delay or indulgence by either party in enforcing any of the terms and conditions of the Contract or the granting of time by either party to the other shall prejudice, affect or restrict the rights of that party under the Contract, nor shall any waiver by either party of any breach of Contract operate as waiver of any subsequent or continuing breach of Contract. 2.10.2 Any waiver of a party's rights, powers or remedies under the Contract must be in

			writing, must be dated and signed by an authorized representative of the party granting such waiver, and must specify the right and the extent to which it is being waived.
		2.11	Severability If any provision or condition of the Contract is prohibited or rendered invalid or unenforceable, such prohibition, invalidity or unenforceability shall not affect the validity or enforceability of any other provisions and conditions of the Contract.
		2.12	Country of Origin "Origin" means the place where the materials, equipment and other supplies for the Facilities are mined, grown, produced or manufactured, and from which the services are provided.
3	Conditions Precedent	3.1	Having signed the Contract, it shall come into effect on the date on which the following conditions have been satisfied: - a) Submission of performance Security in the form specified in the SCC; b) Furnishing of Advance Payment Unconditional Guarantee.
		3.2	If the Condition precedent stipulated on GCC 3.1 is not met by the date specified in the SCC this contract shall not come into effect;
		3.3	If the Employer is satisfied that each of the conditions precedent in this contract has been satisfied (except to the extent waved by him, but subject to such conditions as he shall impose in respect of such waiver) he shall promptly issue to the contractor a certificate of Contract commencement, which shall confirm the start date.
4	Notices	4.1	Unless otherwise stated in the Contract, all notices to be given under the Contract shall be in writing, and shall be sent by personal delivery, airmail post, special courier, cable, telegraph, telex, facsimile or Electronic Data Interchange (EDI) to the address of the relevant party set out in the SCC, with the following provisions: 4.1.1 Any notice sent by cable, telegraph, telex, facsimile or EDI shall be confirmed within two (2) days after dispatch by notice sent by

			airmail post or special courier, except as otherwise specified in the Contract. 4.1.2 Any notice sent by airmail post or special courier shall be deemed (in the absence of evidence of earlier receipt) to have been delivered ten (10) days after dispatch. In proving the fact of dispatch, it shall be sufficient to show that the envelope containing such notice was properly addressed, stamped and conveyed to the postal authorities or courier service for transmission by airmail or special courier. 4.1.3 Any notice delivered personally or sent by cable, telegraph, telex, facsimile or EDI shall be deemed to have been delivered on date of its dispatch. 4.1.4 Either party may change its postal, cable, telex, facsimile or EDI address or addressee for receipt of such notices by ten (10) days' notice to the other party in writing.
		4.2	Notices shall be deemed to include any approvals, consents, instructions, orders and certificates to be given under the Contract.
5	Language and Law	5.1	The language of the Contract and the law governing the Contract are stated in the **SCC.**
6	Disputes Resolution	6.1	In the event of any dispute arising out of this contract, either party shall issue a notice of dispute to settle the dispute amicably. The parties hereto shall, within twenty eight (28) days from the notice date, use their best efforts to settle the dispute amicably through mutual consultations and negotiation. Any unsolved dispute may be referred by either party to an adjudicator nominated by the appointing Authority specified in **SCC.**
		6.2	After the dispute has been referred to the adjudicator, within 30 days, or within such other period as may be proposed by the Parties, the Adjudicator shall give its decision. The rendered decision shall be binding to the Parties.
		6.3	If either Party is dissatisfied with the Adjudicator's decision may, within days specified in the SCC refer the dispute for arbitration. If either party within the period mentioned in the SCC has not referred the matter for arbitration the decision shall become final and binding to the Parties.

		6.4	The arbitration shall be conducted in accordance with the arbitration procedure published by the Institution named and in the place shown in the **SCC**
7	Fees and Cost of Adjudicators	7.1	The rate of the Adjudicator's fee and administrative costs of adjudication shall be borne equally by the Parties. The rates and costs shall be in accordance with the rules of the Appointing Authority. In conducting adjudication to its finality each party shall bear its incurred costs and expenses.
8	Replacement of an Adjudicator	8.1	Should the Adjudicator resign or die, or should the Employer and the Contractor agree that the Adjudicator is not functioning in accordance with the provisions of the Contract, a new Adjudicator will be appointed by the Appointing Authority
		8.2	In the event of disagreement between the Parties to the dispute under Clause 29.1 or 29.2 above, the Adjudicator shall be appointed by the Appointing Authority stated in the SCC.

B. Subject Matter of Contract

9.	Scope of Facilities		9.1	Unless otherwise expressly limited in the Technical Specifications, the Contractor's obligations cover the provision of all Goods and the performance of all Installation Services required for the design, the manufacture (including procurement, quality assurance, construction, installation, associated civil works, Pre-commissioning and delivery) of the Goods and the installation, completion and commissioning of the Facilities in accordance with the plans, procedures, specifications, drawings, codes and any other documents as specified in the Technical Specifications. Such specifications include, but are not limited to, the provision of supervision and engineering services; the supply of labour, materials, equipment, spare parts (as specified in GCC 7.3 below) and accessories; Contractor's Equipment; construction utilities and supplies; temporary materials, structures and facilities; transportation (including, without limitation, unloading and hauling to, from and at the Site); and storage, except for those supplies, works and services that will be provided or performed by the Employer, as set forth in the corresponding Appendix (Scope of Works and Supply by the Employer) to the Agreement.

			9.2	The Contractor shall, unless specifically excluded in the Contract, perform all such work and/or supply all such items and materials not specifically mentioned in the Contract but that can be reasonably inferred from the Contract as being required for attaining Completion of the Facilities as if such work and/or items and materials were expressly mentioned in the Contract.
			9.3	In addition to the supply of Mandatory Spare Parts included in the Contract, the Contractor agrees to supply spare parts required for the operation and maintenance of the Facilities for the period specified in the **SCC**. However, the identity, specifications and quantities of such spare parts and the terms and conditions relating to the supply thereof are to be agreed between the Employer and the Contractor, and the price of such spare parts shall be that given in Price Schedule No. 6, which shall be added to the Contract Price. The price of such spare parts shall include the purchase price therefore and other costs and expenses (including the Contractor's fees) relating to the supply of spare parts.
10.	Time for Commencement and Completion		10.1	The Contractor shall commence work on the Facilities within the period specified in the SCC and without prejudice to GCC 27.2 hereof, the Contractor shall thereafter proceed with the Facilities in accordance with the time schedule specified in the corresponding Appendix (Time Schedule) to the Agreement.
			10.2	The Contractor shall attain Completion of the Facilities (or of a part where a separate time for Completion of such part is specified in the Contract) within the time stated in the SCC or within such extended time to which the Contractor shall be entitled under GCC 41 hereof.
11.	Parties' Responsibilities			<u>(a) Contractor's and Employer's Responsibilities</u>
			11.1	The Contractor shall design, manufacture (including associated purchases and/or subcontracting), install and complete the Facilities with due care and diligence in accordance with the Contract.
			11.2	The Contractor confirms that it has entered into this Contract on the basis of a proper examination of the data relating to the Facilities (including any data as to boring tests) provided by the Employer, and on the basis of information that the Contractor could have obtained from a visual inspection of the Site (if access

				thereto was available) and of other data readily available to it relating to the Facilities as of the date twenty-eight (28) days prior to tender submission. The Contractor acknowledges that any failure to acquaint itself with all such data and information shall not relieve its responsibility for properly estimating the difficulty or cost of successfully performing the Facilities.
			11.3	The Contractor shall acquire in its name all permits, approvals and/or licenses from all local, state or national government authorities or public service undertakings in the United Republic of Tanzania where the Site is located that are necessary for the performance of the Contract, including, without limitation, visas for the Contractor's and Subcontractor's personnel and entry permits for all imported Contractor's Equipment. The Contractor shall acquire all other permits, approvals and/or licenses that are not the responsibility of the Employer under GCC 11.3 hereof and that are necessary for the performance of the Contract.
			11.4	The Contractor shall comply with all laws in force in the United Republic of Tanzania and local by laws where the Facilities are installed and where the Installation Services are carried out. The laws will include all local, state, national or other laws that affect the performance of the Contract and bind upon the Contractor. The Contractor shall indemnify and hold harmless the Employer from and against any and all liabilities, damages, claims, fines, penalties and expenses of whatever nature arising or resulting from the violation of such laws by the Contractor or its personnel, including the Subcontractors and their personnel, but without prejudice to GCC 11.1 hereof.
			11.5	Any Plant, Material and Services that will be incorporated in or be required for the Facilities and other supplies shall have their origin as specified under GCC 1 (Country of Origin).
			11.6	The Contractor shall permit the PE to inspect the Contractor's accounts and records relating to the performance of the Contractor and to have them audited by auditors appointed by the PE, if so required by the PE.
				(b) Employer's Responsibilities
			11.7	The Employer shall ensure the accuracy of all

				information and/or data to be supplied by the Employer as described in the corresponding Appendix (Scope of Works and Supply by the Employer) to the Contract, except when otherwise expressly stated in the Contract.
			11.8	The Employer shall be responsible for acquiring and providing legal and physical possession of the Site and access thereto, and for providing possession of and access to all other areas reasonably required for the proper execution of the Contract, including all requisite rights of way, as specified in the corresponding Appendix (Scope of Works and Supply by the Employer) to the Agreement. The Employer shall give full possession of and accord all rights of access thereto on or before the date(s) specified in that Appendix.
			11.9	The Employer shall acquire and pay for all permits, approvals and/or licenses from all local, state or national government authorities or public service undertakings in the United Republic of Tanzania. Such authorities or undertakings require the Employer to obtain them in the Employer's name, are necessary for the execution of the Contract (they include those required for the performance by both the Contractor and the Employer of their respective obligations under the Contract), and are specified in the corresponding Appendix (**Scope of Works and Supply by the Employer**) to the Agreement.
			11.10	If requested by the Contractor, the Employer shall use its best endeavors to assist the Contractor in obtaining in a timely and expeditious manner all permits, approvals and/or licenses necessary for the execution of the Contract from all local, state or national government authorities or public service undertakings that such authorities or undertakings require the Contractor or Subcontractors or the personnel of the Contractor or Subcontractors, as the case may be, to obtain.
			11.11	Unless otherwise specified in the Contract or agreed upon by the Employer and the Contractor, the Employer shall provide sufficient, properly qualified operating and maintenance personnel; shall supply and make available all raw materials, utilities, lubricants, chemicals, catalysts, other materials and facilities; and shall perform all work and services of whatsoever nature, including those required by the Contractor to

				properly carry out Pre-commissioning, Commissioning and Guarantee Tests, all in accordance with the provisions of the corresponding Appendix (Scope of Works and Supply by the Employer) to the Agreement at or before the time specified in the programme furnished by the Contractor under GCC 19.2 hereof and in the manner thereupon specified or as otherwise agreed upon by the Employer and the Contractor.
			11.12	The Employer shall be responsible for the continued operation of the Facilities after Completion, in accordance with GCC 25.8, and shall be responsible for facilitating the Guarantee Test(s) for the Facilities, in accordance with GCC 26.2.
			11.13	All costs and expenses involved in the performance of the obligations under this GCC 11 shall be the responsibility of the Employer, save those to be incurred by the Contractor with respect to the performance of Guarantee Tests, in accordance with GCC 26.2.

C. Payment

12.	Contract Price	12.1	The Contract Price shall be as specified in Article 2 (Contract Price and Terms of Payment) of the Form of Agreement.
		12.2	Unless indicated otherwise in the SCC, the Contract Price shall be a firm lump sum not subject to any alteration, except in the event of a Change in the Facilities or as otherwise provided in the Contract.
		12.3	Subject to GCCs 10.2, 11.1 and 36 hereof, the Contractor shall be deemed to have satisfied itself as to the correctness and sufficiency of the Contract Price, which shall, except as otherwise provided for in the Contract, cover all its obligations under the Contract.
13.	Terms of Payment	13.1	The Contract Price shall be paid as specified in the corresponding Appendix (Terms and Procedures of Payment) to the Agreement. The procedures to be followed in making application for and processing payments shall be those outlined in the same Appendix.
		13.2	No payment made by the Employer herein shall be deemed to constitute acceptance by the Employer of the Facilities or any part(s) thereof.
		13.3	In the event that the Employer fails to make any payment by its respective due date or within the period set forth in the Contract, the Employer shall pay to the

			Contractor interest on the amount of such delayed payment at the rate(s) shown in the corresponding Appendix (Terms and Procedures of Payment) to the Agreement for the period of delay until payment has been made in full, whether before or after judgment or arbitrage award.
		13.4	The currency or currencies in which payments are made to the Contractor under this Contract shall be specified in the corresponding Appendix (Terms and Procedures of Payment) to the Agreement, subject to the general principle that payments will be made in the currency or currencies in which the Contract Price has been stated in the Contractor's Tendering.
		13.5	All payments shall be made in the currency or currencies specified in the corresponding Appendix (Terms and Procedures of Payment) to the Agreement, pursuant to GCC 13.4.
14.	**Securities**	14.1	Issuance of Securities The Contractor shall provide the securities specified below in favor of the Employer at the times, and in the amount, manner and form specified below.
		14.2	Advance Payment Security 14.2.1 The Contractor shall, within fourteen (14) working days of the notification of contract award, provide a security in an amount equal to the advance payment calculated in accordance with the corresponding Appendix (Terms and Procedures of Payment) to the Agreement, and in the same currency or currencies. 14.2.2 The security shall be in the form provided in the tendering documents or in another form acceptable to the Employer. The amount of the security shall be reduced in proportion to the value of the Facilities executed by and paid to the Contractor from time to time, and shall automatically become null and void when the full amount of the advance payment has been recovered by the Employer. The security shall be returned to the Contractor immediately after its expiration.
		14.3	Performance Security 14.3.1 The Performance Security shall be provided to the Employer no later than the date specified in the Letter of Acceptance and shall be issued in an amount and form and by a bank or surety acceptable to the Employer, and denominated in the types and proportions of the currencies in which the Contract Price is payable as specified

			in the TDS and **SCC** and in accordance with the conditions of contract. 14.3.2 The Performance Security shall be valid until a date 28 days from the date of issue of the Certificate of Completion in the case of a Bank Guarantee, and until one year from the date of issue of the Completion Certificate in the case of a Performance Bond. 14.3.3 Where circumstances necessitate the amendment of the contract after signature, and such amendment is effected, the Employer shall require the Contractor to provide additional Performance Security to cover any cumulative increase of more than ten percent of the Initial Contract Price. 14.3.4 The security shall be denominated in the currency or currencies of the Contract, or in a freely convertible currency acceptable to the Employer, and shall be in one of the forms of bank guarantees provided in the tendering documents, as stipulated by the Employer in the SCC, or in another form acceptable to the Employer. 14.3.5 The security shall automatically be reduced by half on the date of the Operational Acceptance and shall become null and void, eighteen (18) months after Completion of the Facilities or twelve (12) months after Operational Acceptance of the Facilities, whichever occurs first; provided, however, that if the Defects Liability Period has been extended on any part of the Facilities pursuant to GCC 28.8 hereof, the Contractor shall issue an additional security in an amount proportionate to the Contract Price of that part. The security shall be returned to the Contractor immediately after its expiration, provided, however, that if the Contractor, pursuant to GCC 28.10, is liable for an extended warranty obligation, the performance security shall be extended for the period and up to the amount specified in the SCC.
15.	Taxes and Duties	15.1	Except as otherwise specifically provided in the Contract, the Contractor shall bear and pay all taxes, duties, levies and charges assessed on the Contractor, its Subcontractors or their employees by

			all municipal, state or national government authorities in connection with the Facilities in and outside of the United Republic of Tanzania where the Site is located.
		15.2	Notwithstanding GCC 15.1 above, the Employer shall bear and promptly pay all customs and import duties as well as other local taxes like, e.g., a value added tax (VAT), imposed by the law of the United Republic of Tanzania on the Goods specified in Price Schedule No. 1 and that are to be incorporated into the Facilities.
		15.3	If any tax exemptions, reductions, allowances or privileges may be available to the Contractor in the United Republic of Tanzania, the Employer shall use its best endeavors to enable the Contractor to benefit from any such tax savings to the maximum allowable extent.
		15.4	For the purpose of the Contract, it is agreed that the Contract Price specified in Article 2 (Contract Price and Terms of Payment) of the Form of Agreement is based on the taxes, duties, levies and charges prevailing at the date twenty-eight (28) days prior to the date of tender submission in the United Republic of Tanzania (hereinafter called "Tax" in this GCC 15.4). If any rates of Tax are increased or decreased, a new Tax is introduced, an existing Tax is abolished, or any change in interpretation or application of any Tax occurs in the course of the performance of Contract, which was or will be assessed on the Contractor, Subcontractors or their employees in connection with performance of the Contract, an equitable adjustment of the Contract Price shall be made to fully take into account any such change by addition to the Contract Price or deduction there from, as the case may be, in accordance with GCC 37 hereof.

D. Intellectual Property

16.	Patent and Copyright	16.1	The Supplier shall indemnify the PE against all third-party claims of infringement of patent, trademark, or industrial design rights arising from use of the Goods or any part thereof in the United Republic of Tanzania.
		16.2	The copyright in all drawings, documents and other materials containing data and information furnished to the Employer by the Contractor herein shall remain

			vested in the Contractor or, if they are furnished to the Employer directly or through the Contractor by any third party, including suppliers of materials, the copyright in such materials shall remain vested in such third party.
17.	**Confidential Information**	17.1	The Employer and the Contractor shall keep confidential and shall not, without the written consent of the other party hereto, divulge to any third party any documents, data or other information furnished directly or indirectly by the other party hereto in connection with the Contract, whether such information has been furnished prior to, during or following termination of the Contract. Notwithstanding the above, the Contractor may furnish to its Subcontractor(s) such documents, data and other information it receives from the Employer to the extent required for the Subcontractor(s) to perform its work under the Contract, in which event the Contractor shall obtain from such Subcontractor(s) an undertaking of confidentiality similar to that imposed on the Contractor under this GCC 17.
		17.2	The Employer shall not use such documents, data and other information received from the Contractor for any purpose other than the operation and maintenance of the Facilities. Similarly, the Contractor shall not use such documents, data and other information received from the Employer for any purpose other than the design, procurement of Goods, construction or such other work and services as are required for the performance of the Contract.
		17.3	The obligation of a party under GCCs 17.1 and 17.2 above, however, shall not apply to that information which (a) now or hereafter enters the public domain through no fault of that party (b) can be proven to have been possessed by that party at the time of disclosure and which was not previously obtained, directly or indirectly, from the other party hereto (c) otherwise lawfully becomes available to that party from a third party that has no obligation of confidentiality.
		17.4	The above provisions of this GCC 17 shall not in any way modify any undertaking of confidentiality given by either of the parties hereto prior to the date of the Contract in respect of the Facilities or any part

			thereof.
		17.5	The provisions of this GCC 17 shall survive termination, for whatever reason, of the Contract.

E. Execution of the Facilities

18.	**Representatives**	18.1	Project Manager If the Project Manager is not named in the Contract, then within Seven (7) working daysof the Effective Date, the Employer shall appoint and notify the Contractor in writing of the name of the Project Manager. The Employer may from time to time appoint some other person as the Project Manager in place of the person previously so appointed, and shall give a notice of the name of such other person to the Contractor without delay. No such appointment shall be made at such a time or in such a manner as to impede the progress of work on the Facilities. Such appointment shall only take effect upon receipt of such notice by the Contractor. The Project Manager shall represent and act for the Employer at all times during the currency of the Contract. All notices, instructions, orders, certificates, approvals and all other communications under the Contract shall be given by the Project Manager, except as herein otherwise provided. All notices, instructions, information and other communications given by the Contractor to the Employer under the Contract shall be given to the Project Manager, except as herein otherwise provided.
		18.2	Contractor's Representative & Project Manager 18.2.1 If the Contractor's Representative is not named in the Contract, then within Seven (7) working days of the Effective Date, the Contractor shall appoint the Contractor's Representative and shall request the Employer in writing to approve the person so appointed. If the Employer makes no objection to the appointment within Seven (7) working days, the Contractor's Representative shall be deemed to have been approved. If the Employer objects to the appointment within Seven (7) working daysgiving the reason thereof, then the Contractor shall appoint a replacement within Seven (7) working daysof such objection, and the foregoing provisions of this GCC 18.2.1 shall apply thereto.

			18.2.2 The Contractor's Representative shall represent and act for the Contractor at all times during the currency of the Contract and shall give to the Project Manager all the Contractor's notices, instructions, information and all other communications under the Contract. 18.2.3 All notices, instructions, information and all other communications given by the Employer or the Project Manager to the Contractor under the Contract shall be given to the Contractor's Representative or, in its absence, its deputy, except as herein otherwise provided. 18.2.4 The Contractor shall not revoke the appointment of the Contractor's Representative without the Employer's prior written consent, which shall not be unreasonably withheld. If the Employer consents thereto, the Contractor shall appoint some other person as the Contractor's Representative, pursuant to the procedure set out in GCC 18.2.1. 18.2.5 The Contractor's Representative may, subject to the approval of the Employer (which shall not be unreasonably withheld), at any time delegate to any person any of the powers, functions and authorities vested in him or her. Any such delegation may be revoked at any time. Any such delegation or revocation shall be subject to a prior notice signed by the Contractor's Representative, and shall specify the powers, functions and authorities thereby delegated or revoked. No such delegation or revocation shall take effect unless and until a copy thereof has been delivered to the Employer and the Project Manager. Any act or exercise by any person of powers, functions and authorities so delegated to him or her in accordance with this GCC 18.2.3 shall be deemed to be an act or exercise by the Contractor's Representative. 18.2.6 From the commencement of installation of the Facilities at the Site until Completion, the Contractor's Representative shall appoint a suitable person as the construction manager

			(hereinafter referred to as "the Construction Manager"). The Construction Manager shall supervise all work done at the Site by the Contractor and shall be present at the Site throughout normal working hours except when on leave, sick or absent for reasons connected with the proper performance of the Contract. Whenever the Construction Manager is absent from the Site, a suitable person shall be appointed to act as his or her deputy. 18.2.7 The Employer may by notice to the Contractor object to any representative or person employed by the Contractor in the execution of the Contract who, in the reasonable opinion of the Employer, may behave inappropriately, may be incompetent or negligent, or may commit a serious breach of the Site regulations provided under GCC 23.3. The Employer shall provide evidence of the same, whereupon the Contractor shall remove such person from the Facilities. 18.2.6 If any representative or person employed by the Contractor is removed in accordance with GCC 18.2.5, the Contractor shall, where required, promptly appoint a replacement.
19.	**Work Programme**	19.1	Contractor's Organization The Contractor shall supply to the Employer and the Project Manager a chart showing the proposed organization to be established by the Contractor for carrying out work on the Facilities. The chart shall include the identities of the key personnel together with the curricula vitae of such key personnel to be employed within twenty-one (21) days of the Effective Date. The Contractor shall promptly inform the Employer and the Project Manager in writing of any revision or alteration of such an organization chart.
		19.2	Programme of Performance Within twenty-eight (28) days after the date of signing the Agreement, the Contractor shall prepare and submit to the Project Manager a detailed programme of performance of the Contract, made in the form specified in the SCC and showing the sequence in which it proposes to design, manufacture, transport, assemble, install and pre-commission the Facilities, as well as the date by which the Contractor

			reasonably requires that the Employer shall have fulfilled its obligations under the Contract so as to enable the Contractor to execute the Contract in accordance with the programme and to achieve Completion, Commissioning and Acceptance of the Facilities in accordance with the Contract. The programme so submitted by the Contractor shall accord with the Time Schedule included in the corresponding Appendix (Time Schedule) to the Agreement and any other dates and periods specified in the Contract. The Contractor shall update and revise the programme as and when appropriate or when required by the Project Manager, but without modification in the Times for Completion given in the SCC and any extension granted in accordance with GCC 41, and shall submit all such revisions to the Project Manager.
		19.3	Progress Report The Contractor shall monitor progress of all the activities specified in the programme referred to in GCC 19.2 above, and supply a progress report to the Project Manager every month. The progress report shall be in a form acceptable to the Project Manager and shall indicate: (a) percentage completion achieved compared with the planned percentage completion for each activity; and (b) where any activity is behind the programme, giving comments and likely consequences and stating the corrective action being taken.
		19.4	Progress of Performance If at any time the Contractor's actual progress falls behind the programme referred to in GCC 19.2, or it becomes apparent that it will so fall behind, the Contractor shall, at the request of the Employer or the Project Manager, prepare and submit to the Project Manager a revised programme, taking into account the prevailing circumstances, and shall notify the Project Manager of the steps being taken to expedite progress so as to attain Completion of the Facilities within the Time for Completion under GCC 8.2, any extension thereof entitled under GCC 41.1, or any extended period as may otherwise be agreed upon between the Employer and the Contractor.
		19.5	Work Procedures The Contract shall be executed in accordance with

			the Contract Documents and the procedures given in the section on Sample Forms and Procedures of the Contract Documents. The Contractor may execute the Contract in accordance with its own standard project execution plans and procedures to the extent that they do not conflict with the provisions contained in the Contract.
20.	**Subcontracting**	20.1	The corresponding Appendix (List of Approved Subcontractors) to the Agreement specifies major items of supply or services and a list of approved Subcontractors against each item, including vendors. Insofar as no Subcontractors are listed against any such item, the Contractor shall prepare a list of Subcontractors for such item for inclusion in such list. The Contractor may from time to time propose any addition to or deletion from any such list. The Contractor shall submit any such list or any modification thereto to the Employer for its approval in sufficient time so as not to impede the progress of work on the Facilities. Such approval by the Employer for any of the Subcontractors shall not relieve the Contractor from any of its obligations, duties or responsibilities under the Contract.
		20.2	The Contractor shall select and employ its Subcontractors for such major items from those listed in the lists referred to in GCC 20.1.
		20.3	For items or parts of the Facilities not specified in the corresponding Appendix (List of Approved Subcontractors) to the Agreement, the Contractor may employ such Subcontractors as it may select, at its discretion.
21.	**Design and Engineering**	21.1	<u>Specifications and Drawings</u> 21.1.1 The Contractor shall execute the basic and detailed design and the engineering work in compliance with the provisions of the Contract, or where not so specified, in accordance with good engineering practice. The Contractor shall be responsible for any discrepancies, errors or omissions in the specifications, drawings and other technical documents that it has prepared, whether such specifications, drawings and other documents have been approved by the Project Manager or not.

			provided that such discrepancies, errors or omissions are not because of inaccurate information furnished in writing to the Contractor by or on behalf of the Employer. 21.1.2 The Contractor shall be entitled to disclaim responsibility for any design, data, drawing, specification or other document, or any modification thereof provided or designated by or on behalf of the Employer, by giving a notice of such disclaimer to the Project Manager.
		21.2	<u>Codes and Standards</u> Wherever references are made in the Contract to codes and standards in accordance with which the Contract shall be executed, the edition or the revised version of such codes and standards current at the date twenty-eight (28) days prior to date of tender submission shall apply unless otherwise specified. During Contract execution, any changes in such codes and standards shall be applied after approval by the Employer and shall be treated in accordance with GCC 40.
		21.3	<u>Approval/Review of Technical Documents by Project Manager</u> 21.3.1 The Contractor shall prepare (or cause its Subcontractors to prepare) and furnish to the Project Manager the documents listed in the corresponding Appendix (List of Documents for Approval or Review) to the Agreement for its approval or review as specified and in accordance with the requirements of GCC 19.2 (Programme of Performance). Any part of the Facilities covered by or related to the documents to be approved by the Project Manager shall be executed only after the Project Manager's approval thereof. GCCs 21.3.2 through 21.3.7 shall apply to those documents requiring the Project Manager's approval, but not to those furnished to the Project Manager for its review only. 21.3.2 Within fourteen (14) days after receipt by the Project Manager of any document requiring the Project Manager's approval in accordance with GCC 21.3.1, the Project Manager shall either return one copy thereof to the

			Contractor with its approval endorsed thereon or shall notify the Contractor in writing of its disapproval thereof and the reasons therefore and the modifications that the Project Manager proposes. If the Project Manager fails to take such action within the said fourteen (14) working days, then the said document shall be deemed to have been approved by the Project Manager. 21.3.3 The Project Manager shall not disapprove any document, except on the grounds that the document does not comply with some specified provision of the Contract or that it is contrary to good engineering practice. 21.3.4 If the Project Manager disapproves the document, the Contractor shall modify the document and resubmit it for the Project Manager's approval in accordance with GCC 21.3.2. If the Project Manager approves the document subject to modification(s), the Contractor shall make the required modification(s), whereupon the document shall be deemed to have been approved. 21.3.5 If any dispute or difference occurs between the Employer and the Contractor in connection with or arising out of the disapproval by the Project Manager of any document and/or any modification(s) thereto that cannot be settled between the parties within a reasonable period, then such dispute or difference may be referred to an Adjudicator for determination in accordance with GCC 6.1 hereof. If such dispute or difference is referred to an Adjudicator, the Project Manager shall give instructions as to whether and if so, how, performance of the Contract is to proceed. The Contractor shall proceed with the Contract in accordance with the Project Manager's instructions, provided that if the Adjudicator upholds the Contractor's view on the dispute and if the Employer has not given notice under GCC 6.1.2 hereof, then the Contractor shall be reimbursed by the Employer for any additional costs incurred by reason of such instructions and shall be relieved of such responsibility or liability in connection with the dispute and the

			execution of the instructions as the Adjudicator shall decide, and the Time for Completion shall be extended accordingly. 21.3.6 The Project Manager's approval, with or without modification of the document furnished by the Contractor, shall not relieve the Contractor of any responsibility or liability imposed upon it by any provisions of the Contract except to the extent that any subsequent failure results from modifications required by the Project Manager. 21.3.7 The Contractor shall not depart from any approved document unless the Contractor has first submitted to the Project Manageran amended document and obtained the Project Manager's approval thereof, pursuant to the provisions of this GCC 21.3. 21.3.8 If the Project Manager requests any change in any already approved document and/or in any document based thereon, the provisions of GCC 40 shall apply to such request.
22.	Procurement	22.1	<u>Goods</u> Subject to GCC 15.2, the Contractor shall manufacture or procure and transport all the Goods in an expeditious and orderly manner to the Site.
		22.2	<u>Employer-Supplied Plant, Equipment, and Materials</u> If the corresponding Appendix (Scope of Works and Supply by the Employer) to the Agreement provides that the Employer shall furnish any specific items of machinery, equipment or materials to the Contractor, the following provisions shall apply: 22.2.1 The Employer shall, at its own risk and expense, transport each item to the place on or near the Site as agreed upon by the parties and make such item available to the Contractor at the time specified in the programme furnished by the Contractor, pursuant to GCC 19.2, unless otherwise mutually agreed. 22.2.2 Upon receipt of such item, the Contractor shall inspect the same visually and notify the Project Manager of any detected shortage, defect or default. The Employer shall

			immediately remedy any shortage, defect or default, or the Contractor shall, if practicable and possible, at the request of the Employer, remedy such shortage, defect or default at the Employer's cost and expense. After inspection, such item shall fall under the care, custody and control of the Contractor. The provision of this GCC 22.2.2 shall apply to any item supplied to remedy any such shortage or default or to substitute for any defective item, or shall apply to defective items that have been repaired. 22.2.3 The foregoing responsibilities of the Contractor and its obligations of care, custody and control shall not relieve the Employer of liability for any undetected shortage, defect or default, nor place the Contractor under any liability for any such shortage, defect or default whether under GCC 28 or under any other provision of Contract.
		22.3	<u>Transportation</u> 22.3.1 The Contractor shall at its own risk and expense transport all the Goods and the Contractor's Equipment to the Site by the mode of transport that the Contractor judges most suitable under all the circumstances. 22.3.2 Unless otherwise provided in the Contract, the Contractor shall be entitled to select any safe mode of transport operated by any person to carry the Goods and the Contractor's Equipment. 22.3.3 Upon dispatch of each shipment of the Goods and the Contractor's Equipment, the Contractor shall notify the Employer by telex, cable, facsimile or Electronic Data Interchange (EDI) of the description of the Goods and of the Contractor's Equipment, the point and means of dispatch, and the estimated time and point of arrival in the United Republic of Tanzania, if applicable, and at the Site. The Contractor shall furnish the Employer with relevant shipping documents to be agreed upon between the parties. 22.3.4 The Contractor shall be responsible for obtaining, if necessary, approvals from the authorities for transportation of the Goods

			and the Contractor's Equipment to the Site. The Employer shall use its best endeavors in a timely and expeditious manner to assist the Contractor in obtaining such approvals, if requested by the Contractor. The Contractor shall indemnify and hold harmless the Employer from and against any claim for damage to roads, bridges or any other traffic facilities that may be caused by the transport of the Goods and the Contractor's Equipment to the Site.
		22.4	Customs Clearance The Contractor shall, at its own expense, handle all imported Goods and Contractor's Equipment at the point(s) of import and shall handle any formalities for customs clearance, subject to the Employer's obligations under GCC 15.2, provided that if applicable laws or regulations require any application or act to be made by or in the name of the Employer, the Employer shall take all necessary steps to comply with such laws or regulations. In the event of delays in customs clearance that are not the fault of the Contractor, the Contractor shall be entitled to an extension in the Time for Completion, pursuant to GCC 41.
23.	Installation	23.1	Setting Out/Supervision/Labour 23.1.1 *Bench Mark*: The Contractor shall be responsible for the true and proper setting-out of the Facilities in relation to bench marks, reference marks and lines provided to it in writing by or on behalf of the Employer. If, at any time during the progress of installation of the Facilities, any error shall appear in the position, level or alignment of the Facilities, the Contractor shall forthwith notify the Project Manager of such error and, at its own expense, immediately rectify such error to the reasonable satisfaction of the Project Manager. If such error is based on incorrect data provided in writing by or on behalf of the Employer, the expense of rectifying the same shall be borne by the Employer. 23.1.2 *Contractor's Supervision*: The Contractor shall give or provide all necessary superintendence during the installation of the Facilities, and the Construction Manager or its

			deputy shall be constantly on the Site to provide full-time superintendence of the installation. The Contractor shall provide and employ only technical personnel who are skilled and experienced in their respective callings and supervisory staff who are competent to adequately supervise the work at hand. 23.1.3 *Labour:* (a) The Contractor shall provide and employ on the Site in the installation of the Facilities such skilled, semi-skilled and unskilled labour as is necessary for the proper and timely execution of the Contract. The Contractor is encouraged to use local labour that has the necessary skills. (b) Unless otherwise provided in the Contract, the Contractor shall be responsible for the recruitment, transportation, accommodation and catering of all labour, local or expatriate, required for the execution of the Contract and for all payments in connection therewith. (c) The Contractor shall be responsible for obtaining all necessary permit(s) and/or visa(s) from the appropriate authorities for the entry of all labour and personnel to be employed on the Site into the United Republic of Tanzania and in the exact region where the Site is located. (d) The Contractor shall at its own expense provide the means of repatriation to all of its and its Subcontractor's personnel employed on the Contract at the Site to their various home countries. It shall also provide suitable temporary maintenance of all such persons from the cessation of their employment on the Contract to the date programmed for their departure. In the event that the Contractor defaults in providing such means of transportation and temporary maintenance, the Employer may provide the same to such personnel and recover the cost of doing so from the

			Contractor. (e) The Contractor shall at all times during the progress of the Contract use its best endeavors to prevent any unlawful, riotous or disorderly conduct or behavior by or amongst its employees and the labour of its Subcontractors. (f) The Contractor shall, in all dealings with its labour and the labour of its Subcontractors currently employed on or connected with the Contract, pay due regard to all recognized festivals, official holidays, religious or other customs and all local laws and regulations pertaining to the employment of labour.
		23.2	Contractor's Equipment 23.2.1 All Contractor's Equipment brought by the Contractor onto the Site shall be deemed to be intended to be used exclusively for the execution of the Contract. The Contractor shall not remove the same from the Site without the Project Manager's consent that such Contractor's Equipment is no longer required for the execution of the Contract. 23.2.2 Unless otherwise specified in the Contract, upon completion of the Facilities, the Contractor shall remove from the Site all Equipment brought by the Contractor onto the Site and any surplus materials remaining thereon. 23.2.3 The Employer will, if requested, use its best endeavors to assist the Contractor in obtaining any local, state or national government permission required by the Contractor for the export of the Contractor's Equipment imported by the Contractor for use in the execution of the Contract that is no longer required for the execution of the Contract.
		23.3	Site Regulations and Safety The Employer and the Contractor shall establish Site regulations setting out the rules to be observed in the execution of the Contract at the Site and shall comply therewith. The Contractor shall prepare and submit to the Employer, with a copy to the Project

			Manager, proposed Site regulations for the Employer's approval, which approval shall not be unreasonably withheld. Such Site regulations shall include, but shall not be limited to, rules in respect of security, safety of the Facilities, gate control, sanitation, medical care, and fire prevention.
		23.4	<u>Opportunities for Other Contractors</u> 23.4.1 The Contractor shall, upon written request from the Employer or the Project Manager, give all reasonable opportunities for carrying out the work to any other contractors employed by the Employer on or near the Site. 23.4.2 If the Contractor, upon written request from the Employer or the Project Manager, makes available to other contractors any roads or ways the maintenance for which the Contractor is responsible, permits the use by such other contractors of the Contractor's Equipment, or provides any other service of whatsoever nature for such other contractors, the Employer shall fully compensate the Contractor for any loss or damage caused or occasioned by such other contractors in respect of any such use or service, and shall pay to the Contractor reasonable remuneration for the use of such equipment or the provision of such services. 23.4.3 The Contractor shall also so arrange to perform its work as to minimize, to the extent possible, interference with the work of other contractors. The Project Manager shall determine the resolution of any difference or conflict that may arise between the Contractor and other contractors and the workers of the Employer in regard to their work. 23.4.4 The Contractor shall notify the Project Manager promptly of any defects in the other contractors' work that come to its notice, and that could affect the Contractor's work. The Project Manager shall determine the corrective measures, if any, required to rectify the situation after inspection of the Facilities. Decisions made by the Project Manager shall be binding on the Contractor.

		23.5	Emergency Work If, by reason of an emergency arising in connection with and during the execution of the Contract, any protective or remedial work is necessary as a matter of urgency to prevent damage to the Facilities, the Contractor shall immediately carry out such work. If the Contractor is unable or unwilling to do such work immediately, the Employer may do or cause such work to be done as the Employer may determine is necessary in order to prevent damage to the Facilities. In such event the Employer shall, as soon as practicable after the occurrence of any such emergency, notify the Contractor in writing of such emergency, the work done and the reasons therefore. If the work done or caused to be done by the Employer is work that the Contractor was liable to do at its own expense under the Contract, the reasonable costs incurred by the Employer in connection therewith shall be paid by the Contractor to the Employer. Otherwise, the cost of such remedial work shall be borne by the Employer.
		23.6	Site Clearance 23.6.1 *Site Clearance in Course of Performance*: In the course of carrying out the Contract, the Contractor shallkeep theSite reasonably free from all unnecessary obstruction, store or remove any surplus materials, clear away any wreckage, rubbish or temporary works from the Site, and remove any Contractor's Equipment no longer required for execution of the Contract. *23.6.1 Clearance of Site after Completion*: After Completion of all parts of the Facilities, the Contractor shall clear away and remove all wreckage, rubbish and debris of any kind from the Site, and shall leave the Site and Facilities clean and safe.
		23.7	Watching and Lighting The Contractor shall provide and maintain at its own expense alllighting, fencing, and watching when and where necessary for the proper execution and the protection of the Facilities, or for the safety of the owners and occupiers of adjacent property and for the safety of the public.

		23.8	Work at Night and on Holidays 23.8.1 Unless otherwise provided in the Contract, no work shall be carried out during the night and on public holidays of the United Republic of Tanzania without prior written consent of the Employer, except where work is necessary or required to ensure safety of the Facilities or for the protection of life, or to prevent loss or damage to property, when the Contractor shall immediately advise the Project Manager, provided that provisions of this GCC 23.8.1 shall not apply to any work which is customarily carried out by rotary or double-shifts. 23.8.2 Notwithstanding GCCs 23.8.1 or 22.1.3, if and when the Contractor considers it necessary to carry out work at night or on public holidays so as to meet the Time for Completion and requests the Employer's consent thereto, the Employer shall not unreasonably withhold such consent.
24.	**Test and Inspection**	24.1	The Contractor shall at its own expense carry out at the place of manufacture and/or on the Site all such tests and/or inspections of the Goods and any part of the Facilities as are specified in the Contract.
		24.2	The Employer and the Project Manager or their designated representatives shall be entitled to attend the aforesaid test and/or inspection, provided that the Employer shall bear all costs and expenses incurred in connection with such attendance including, but not limited to, all traveling and board and lodging expenses.
		24.3	Whenever the Contractor is ready to carry out any such test and/or inspection, the Contractor shall give a reasonable advance notice of such test and/or inspection and of the place and time thereof to the Project Manager. The Contractor shall obtain from any relevant third party or manufacturer any necessary permission or consent to enable the Employer and the Project Manager (or their designated representatives) to attend the test and/or inspection.
		24.4	The Contractor shall provide the Project Manager with a certified report of the results of any such test and/or inspection.

			If the Employer or Project Manager (or their designated representatives) fails to attend the test and/or inspection, or if it is agreed between the parties that such persons shall not do so, then the Contractor may proceed with the test and/or inspection in the absence of such persons, and may provide the Project Manager with a certified report of the results thereof.
		24.5	The Project Manager may require the Contractor to carry out any test and/or inspection not required by the Contract, provided that the Contractor's reasonable costs and expenses incurred in the carrying out of such test and/or inspection shall be added to the Contract Price. Further, if such test and/or inspection impedes the progress of work on the Facilities and/or the Contractor's performance of its other obligations under the Contract, due allowance will be made in respect of the Time for Completion and the other obligations so affected
		24.6	If any Goods or any part of the Facilities fails to pass any test and/or inspection, the Contractor shall either rectify or replace such Goods or part of the Facilities and shall repeat the test and/or inspection upon giving a notice under GCC 24.3.
		24.7	If any dispute or difference of opinion shall arise between the parties in connection with or arising out of the test and/or inspection of the Goods or part of the Facilities that cannot be settled between the parties within a reasonable period of time, it may be referred to an Adjudicator for determination in accordance with GCC 6.1.
		24.8	The Contractor shall afford the Employer and the Project Manager, at the Employer's expense, access at any reasonable time to any place where the Goods are being manufactured or the Facilities are being installed, in order to inspect the progress and the manner of manufacture or installation, provided that the Project Manager shall give the Contractor a reasonable prior notice.
		24.9	The Contractor agrees that neither the execution of a test and/or inspection of Goods or any part of the Facilities, nor the attendance by the Employer or the Project Manager, nor the issue of any test certificate pursuant to GCC 24.4, shall release the Contractor from any other responsibilities under the Contract.
		24.10	No part of the Facilities or foundations shall be

			covered up on the Site without the Contractor carrying out any test and/or inspection required under the Contract. The Contractor shall give a reasonable notice to the Project Manager whenever any such ready or about to be ready for test and/or inspection; such test and/or inspection and notice thereof shall be subject to the requirements of the Contract.
		24.11	The Contractor shall uncover any part of the Facilities or foundations, or shall make openings in or through the same as the Project Manager may from time to time require at the Site, and shall reinstate and make good such part or parts. If any parts of the Facilities or foundations have been covered up at the Site after compliance with the requirement of GCC 24.10 and are found to be executed in accordance with the Contract, the expenses of uncovering, making openings in or through, reinstating, and making good the same shall be borne by the Employer, and the Time for Completion shall be reasonably adjusted to the extent that the Contractor has thereby been delayed or impeded in the performance of any of its obligations under the Contract.
25.	**Completion of the Facilities**	25.1	As soon as the Facilities or any part thereof has, in the opinion of the Contractor, been completed operationally and structurally and put in a tight and clean condition as specified in the Technical Specifications, excluding minor items not materially affecting the operation or safety of the Facilities, the Contractor shall so notify the Employer in writing.
		25.2	Within seven (7) working days after receipt of the notice from the Contractor under GCC 25.1, the Employer shall supply the operating and maintenance personnel specified in the corresponding Appendix (Scope of Works and Supply by the Employer) to the Agreement for Pre-commissioning of the Facilities or any part thereof. Pursuant to the corresponding Appendix (Scope of Works and Supply by the Employer) to the Agreement, the Employer shall also provide, within the said seven (7) day period, the raw materials, utilities, lubricants, chemicals, catalysts, facilities, services and other matters required for Pre-commissioning of the Facilities or any part thereof.

		25.3	As soon as reasonably practicable after the operating and maintenance personnel have been supplied by the Employer and the raw materials, utilities, lubricants, chemicals, catalysts, facilities, services and other matters have been provided by the Employer in accordance with GCC 25.2, the Contractor shall commence Pre-commissioning of the Facilities or the relevant part thereof in preparation for Commissioning.
		25.4	As soon as all works in respect of Pre-commissioning are completed and, in the opinion of the Contractor, the Facilities or any part thereof is ready for Commissioning, the Contractor shall so notify the Project Manager in writing.
		25.5	The Project Manager shall, within fourteen (14) days after receipt of the Contractor's notice under GCC 25.4, either issue a Completion Certificate in the form specified in the Sample Forms and Procedures section in the tendering documents, stating that the Facilities or that part thereof have reached Completion as of the date of the Contractor's notice under GCC 245.4, or notify the Contractor in writing of any defects and/or deficiencies. If the Project Manager notifies the Contractor of any defects and/or deficiencies, the Contractor shall then correct such defects and/or deficiencies, and shall repeat the procedure described in GCC 25.4. If the Project Manager is satisfied that the Facilities or that part thereof have reached Completion, the Project Manager shall, within seven (7) days after receipt of the Contractor's repeated notice, issue a Completion Certificate stating that the Facilities or that part thereof have reached Completion as of the date of the Contractor's repeated notice. If the Project Manager is not so satisfied, then it shall notify the Contractor in writing of any defects and/or deficiencies within seven (7) days after receipt of the Contractor's repeated notice, and the above procedure shall be repeated.
		25.6	If the Project Manager fails to issue the Completion Certificate and fails to inform the Contractor of any defects and/or deficiencies within fourteen (14) days after receipt of the Contractor's notice under GCC 25.4 or within seven (7) days after receipt of the Contractor's repeated notice under GCC 25.5, or if

			the Employer makes use of the Facilities or part thereof, then the Facilities or that part thereof shall be deemed to have reached Completion as of the date of the Contractor's notice or repeated notice, or as of the Employer's use of the Facilities, as the case may be.
		25.7	As soon as possible after Completion, the Contractor shall complete all outstanding minor items so that the Facilities are fully in accordance with the requirements of the Contract, failing which the Employer will undertake such completion and deduct the costs thereof from any monies owing to the Contractor.
		25.8	Upon Completion, the Employer shall be responsible for the care and custody of the Facilities or the relevant part thereof, together with the risk of loss or damage thereto, and shall thereafter take over the Facilities or the relevant part thereof.
26.	**Commissioning and Operational Acceptance**	26.1	<u>Commissioning</u> 26.1.1 Commissioning of the Facilities or any part thereof shall be commenced by the Contractor immediately after issue of the Completion Certificate by the Project Manager, pursuant to GCC 25.5, or immediately after issue of the deemed Completion, under GCC 25.6. 26.1.2 The Employer shall supply the operating and maintenance personnel and all raw materials, utilities, lubricants, chemicals, catalysts, facilities, services and other matters required for Commissioning.
		26.2	<u>Guarantee Test</u> 26.2.1 The Guarantee Test (and repeats thereof) shall be conducted by the Contractor during Commissioning of the Facilities or the relevant part thereof to ascertain whether the Facilities or the relevant part can attain the Functional Guarantees specified in the Technical Specifications. The Contractor's and Project Manager's advisory personnel shall attend the Guarantee Test, and shall advise and assist the Employer. The Employer shall promptly provide the Contractor with such information as the Contractor may reasonably require in relation to the conduct and results of the Guarantee Test (and any repeats thereof).

			26.2.2 If for reasons not attributable to the Contractor, the Guarantee Test of the Facilities or the relevant part thereof cannot be successfully completed within the period from the date of Completion specified in the SCC or any other period agreed upon by the Employer and the Contractor, the Contractor shall be deemed to have fulfilled its obligations with respect to the Functional Guarantees, and GCCs 29.2 and 28.3 shall not apply.
		26.3	Operational Acceptance 26.3.1 Subject to GCC 26.4 below, Operational Acceptance shall occur in respect of the Facilities or any part thereof when (a) the Guarantee Test has been successfully completed and the Functional Guarantees are met; or (b) the Guarantee Test has not been successfully completed or has not been carried out for reasons not attributable to the Contractor within the period from the date of Completion specified in the SCC or any other agreed upon period as specified in GCC 26.2.2 above; or (c) the Contractor has paid the liquidated damages specified in GCC 29.3 hereof; and (d) any minor items mentioned in GCC 24.7 hereof relevant to the Facilities or that part thereof have been completed. 26.3.2 At any time after any of the events set out in GCC 26.3.1 have occurred, the Contractor may give a notice to the Project Manager requesting the issue of an Operational Acceptance Certificate in the form provided in the Tendering Documents or in another form acceptable to the Employer in respect of the Facilities or the part thereof specified in such notice as of the date of such notice. 26.3.3 The Project Manager shall, after consultation with the Employer, and within seven (7) days after receipt of the Contractor's notice, issue

			an Operational Acceptance Certificate. 26.3.4 If within seven (7) days after receipt of the Contractor's notice, the Project Manager fails to issue the Operational Acceptance Certificate or fails to inform the Contractor in writing of the justifiable reasons why the Project Manager has not issued the Operational Acceptance Certificate, the Facilities or the relevant part thereof shall be deemed to have been accepted as of the date of the Contractor's said notice.
		26.4	Partial Acceptance 26.4.1 If the Contract specifies that Completion and Commissioning shall be carried out in respect of parts of the Facilities, the provisions relating to Completion and Commissioning including the Guarantee Test shall apply to each such part of the Facilities individually, and the Operational Acceptance Certificate shall be issued accordingly for each such part of the Facilities. 26.4.2 If a part of the Facilities comprises facilities such as buildings, for which no Commissioning or Guarantee Test is required, then the Project Manager shall issue the Operational Acceptance Certificate for such facility when it attains Completion, provided that the Contractor shall thereafter complete any outstanding minor items that are listed in the Operational Acceptance Certificate.

F. Guarantees and Liabilities

27	**Completion Time Guarantee**	27.1	The Contractor guarantees that it shall attain Completion of the Facilities (or a part for which a separate time for completion is specified in the SCC) within the Time for Completion specified in the SCC pursuant to GCC 8.2, or within such extended time to which the Contractor shall be entitled under GCC 41 hereof.
		27.2	If the Contractor fails to attain Completion of the Facilities or any part thereof within the Time for Completion or any extension thereof under GCC 41, the Contractor shall pay to the Employer liquidated damages in the amount specified in the SCC as a

			percentage rate of the Contract Price, or the relevant part thereof. The aggregate amount of such liquidated damages shall in no event exceed the amount specified as "Maximum" in the SCC. Once the "Maximum" is reached, the Employer may consider termination of the Contract, pursuant to GCC 43.2.2. Such payment shall completely satisfy the Contractor's obligation to attain Completion of the Facilities or the relevant part thereof within the Time for Completion or any extension thereof under GCC 41. The Contractor shall have no further liability whatsoever to the Employer in respect thereof. However, the payment of liquidated damages shall not in any way relieve the Contractor from any of its obligations to complete the Facilities or from any other obligations and liabilities of the Contractor under the Contract. Save for liquidated damages payable under this GCC 27.2, the failure by the Contractor to attain any milestone or other act, matter or thing by any date specified in the corresponding Appendix (Time Schedule) to the Agreement and/or other programme of work prepared pursuant to GCC 19.2 shall not render the Contractor liable for any loss or damage thereby suffered by the Employer.
		27.3	If the Contractor attains Completion of the Facilities or any part thereof before the Time for Completion or any extension thereof under GCC 41, the Employer shall pay to the Contractor a bonus in the amount specified in the SCC. The aggregate amount of such bonus shall in no event exceed the amount specified as "Maximum" in the SCC.
28.	Defect Liability	28.1	The Contractor warrants that the Facilities or any part thereof shall be free from defects in the design, engineering, materials and workmanship of the Goods supplied and of the work executed.
		28.2	The Defect Liability Period shall be eighteen (18) months from the date of Completion of the Facilities (or any part thereof) or twelve (12) months from the date of Operational Acceptance of the Facilities (or any part thereof), whichever first occurs, unless specified otherwise in the SCC. If during the Defect Liability Period any defect should be found in the design, engineering, materials and workmanship of the Goods supplied or of the work

			executed by the Contractor, the Contractor shall promptly, in consultation and agreement with the Employer regarding appropriate remedying of the defects, and at its cost, repair, replace or otherwise make good (as the Contractor shall, at its discretion, determine) such defect as well as any damage to the Facilities caused by such defect. The Contractor shall not be responsible for the repair, replacement or making good of any defect or of any damage to the Facilities arising out of or resulting from any of the following causes: (a) improper operation or maintenance of the Facilities by the Employer (b) operation of the Facilities outside specifications provided in the Contract (c) normal wear and tear.
		28.3	The Contractor's obligations under this GCC 28 shall not apply to (a) any materials that are supplied by the Employer under GCC 22.2, are normally consumed in operation, or have a normal life shorter than the Defect Liability Period stated herein (b) any designs, specifications or other data designed, supplied or specified by or on behalf of the Employer or any matters for which the Contractor has disclaimed responsibility herein (c) any other materials supplied or any other work executed by or on behalf of the Employer, except for the work executed by the Employer under GCC 28.7.
		28.4	The Employer shall give the Contractor a notice stating the nature of any such defect together with all available evidence thereof, promptly following the discovery thereof. The Employer shall afford all reasonable opportunity for the Contractor to inspect any such defect.
		28.5	The Employer shall afford the Contractor all necessary access to the Facilities and the Site to enable the Contractor to perform its obligations under this GCC 28. The Contractor may, with the consent of the Employer, remove from the Site any Goods or any part of the Facilities that are defective if the nature of the defect,

			and/or any damage to the Facilities caused by the defect, is such that repairs cannot be expeditiously carried out at the Site.
		28.6	If the repair, replacement or making good is of such a character that it may affect the efficiency of the Facilities or any part thereof, the Employer may give to the Contractor a notice requiring that tests of the defective part of the Facilities shall be made by the Contractor immediately upon completion of such remedial work, whereupon the Contractor shall carry out such tests. If such part fails the tests, the Contractor shall carry out further repair, replacement or making good (as the case may be) until that part of the Facilities passes such tests. The tests shall be agreed upon by the Employer and the Contractor.
		28.7	If the Contractor fails to commence the work necessary to remedy such defect or any damage to the Facilities caused by such defect within a reasonable time (which shall in no event be considered to be less than fifteen (15) days), the Employer may, following notice to the Contractor, proceed to do such work, and the reasonable costs incurred by the Employer in connection therewith shall be paid to the Employer by the Contractor or may be deducted by the Employer from any monies due the Contractor or claimed under the Performance Security.
		28.8	If the Facilities or any part thereof cannot be used by reason of such defect and/or making good of such defect, the Defect Liability Period of the Facilities or such part, as the case may be, shall be extended by a period equal to the period during which the Facilities or such part cannot be used by the Employer because of any of the aforesaid reasons.
		28.9	Except as provided in GCCs 28 and 34, the Contractor shall be under no liability whatsoever and howsoever arising, and whether under the Contract or at law, in respect of defects in the Facilities or any part thereof, the Goods, design or engineering or work executed that appear after Completion of the Facilities or any part thereof, except where such defects are the result of the gross negligence, fraud, criminal or willful action of the Contractor.
		28.10	In addition, the Contractor shall also provide an extended warranty for any such component of the Facilities and during the period of time as may be

			specified in the SCC. Such obligation shall be in addition to the defect liability specified under GCC 28.2.
29.	**Functional Guarantees**	29.1	The Contractor guarantees that during the Guarantee Test, the Facilities and all parts thereof shall attain the Functional Guarantees specified in the corresponding Appendix (Functional Guarantees) to the Agreement, subject to and upon the conditions therein specified.
		29.2	If, for reasons attributable to the Contractor, the minimum level of the Functional Guarantees specified in the corresponding Appendix (Functional Guarantees) to the Agreement are not met either in whole or in part, the Contractor shall at its cost and expense make such changes, modifications and/or additions to the Plant or any part thereof as may be necessary to meet at least the minimum level of such Guarantees. The Contractor shall notify the Employer upon completion of the necessary changes, modifications and/or additions, and shall request the Employer to repeat the Guarantee Test until the minimum level of the Guarantees has been met. If the Contractor eventually fails to meet the minimum level of Functional Guarantees, the Employer may consider termination of the Contract, pursuant to GCC 43.2.2.
		29.3	If, for reasons attributable to the Contractor, the Functional Guarantees specified in the corresponding Appendix (Functional Guarantees) to the Agreement are not attained either in whole or in part, but the minimum level of the Functional Guarantees specified in the said Appendix to the Agreement is met, the Contractor shall, at the Contractor's option, either (a) make such changes, modifications and/or additions to the Facilities or any part thereof that are necessary to attain the Functional Guarantees at its cost and expense, and shall request the Employer to repeat the Guarantee Test or (b) pay liquidated damages to the Employer in respect of the failure to meet the Functional Guarantees in accordance with the provisions in the corresponding Appendix (Functional Guarantees) to the Agreement.
		29.4	The payment of liquidated damages under GCC 29.3, up to the limitation of liability specified in the SCC, shall completely satisfy the Contractor's guarantees under GCC 29.3, and the Contractor shall have no further liability whatsoever to the Employer in respect

			thereof. Upon the payment of such liquidated damages by the Contractor, the Project Manager shall issue the Operational Acceptance Certificate for the Facilities or any part thereof in respect of which the liquidated damages have been so paid.
30.	Patent Indemnity	30.1	The Contractor shall, subject to the Employer's compliance with GCC 30.2, indemnify and hold harmless the Employer and its employees and officers from and against any and all suits, actions or administrative proceedings, claims, demands, losses, damages, costs, and expenses of whatsoever nature, including attorney's fees and expenses, which the Employer may suffer as a result of any infringement or alleged infringement of any patent, utility model, registered design, trademark, copyright or other intellectual property right registered or otherwise existing at the date of the Contract by reason of: (a) the installation of the Facilities by the Contractor or the use of the Facilities in the United Republic of Tanzania; and (b) the sale of the products produced by the Facilities in United Republic of Tanzania. Such indemnity shall not cover any use of the Facilities or any part thereof other than for the purpose indicated by or to be reasonably inferred from the Contract, any infringement resulting from the use of the Facilities or any part thereof, or any products produced thereby in association or combination with any other equipment, plant or materials not supplied by the Contractor, pursuant to the Agreement.
		30.2	If any proceedings are brought or any claim is made against the Employer arising out of the matters referred to in GCC 30.1, the Employer shall promptly give the Contractor a notice thereof, and the Contractor may at its own expense and in the Employer's name conduct such proceedings or claim and any negotiations for the settlement of any such proceedings or claim. If the Contractor fails to notify the Employer within twenty-eight (28) days after receipt of such notice that it intends to conduct any such proceedings or claim, then the Employer shall be free to conduct the same on its own behalf. Unless the Contractor has so failed to notify the Employer within the twenty-eight (28) day period, the Employer shall make no admission that may be prejudicial to the defense of any such proceedings or claim.

			The Employer shall, at the Contractor's request, afford all available assistance to the Contractor in conducting such proceedings or claim, and shall be reimbursed by the Contractor for all reasonable expenses incurred in so doing.
		30.3	The Employer shall indemnify and hold harmless the Contractor and its employees, officers and Subcontractors from and against any and all suits, actions or administrative proceedings, claims, demands, losses, damages, costs, and expenses of whatsoever nature, including attorney's fees and expenses, which the Contractor may suffer as a result of any infringement or alleged infringement of any patent, utility model, registered design, trademark, copyright or other intellectual property right registered or otherwise existing at the date of the Contract arising out of or in connection with any design, data, drawing, specification, or other documents or materials provided or designed by or on behalf of the Employer.
31.	**Limitation of Liability**	31.1	Except in cases of criminal negligence or willful misconduct, (a) the Contractor shall not be liable to the Employer, whether in contract, tort, or otherwise, for any indirect or consequential loss or damage, loss of use, loss of production, or loss of profits or interest costs, provided that this exclusion shall not apply to any obligation of the Contractor to pay liquidated damages to the Employer and (b) the aggregate liability of the Contractor to the Employer, whether under the Contract, in tort or otherwise, shall not exceed the total Contract Price, provided that this limitation shall not apply to the cost of repairing or replacing defective equipment, or to any obligation of the Contractor to indemnify the Employer with respect to patent infringement.

G. Risk Distribution

32.	**Transfer of Ownership**	32.1	Ownership of the Goods (including spare parts) to be imported into the United Republic of Tanzania shall be transferred to the Employer upon loading on to the mode of transport to be used to convey the Goods from the country of origin.

		32.2	Ownership of the Goods (including spare parts) procured in the United Republic of Tanzania where the Site is located shall be transferred to the Employer when the Goods are brought on to the Site.
		32.3	Ownership of the Contractor's Equipment used by the Contractor and its Subcontractors in connection with the Contract shall remain with the Contractor or its Subcontractors.
		32.4	Ownership of any Goods in excess of the requirements for the Facilities shall revert to the Contractor upon Completion of the Facilities or at such earlier time when the Employer and the Contractor agree that the Goods in question are no longer required for the Facilities.
		32.5	Notwithstanding the transfer of ownership of the Goods, the responsibility for care and custody thereof together with the risk of loss or damage thereto shall remain with the Contractor pursuant to GCC 33 (Care of Facilities) hereof until Completion of the Facilities or the part thereof in which such Goods are incorporated.
33.	Care of Facilities	33.1	The Contractor shall be responsible for the care and custody of the Facilities or any part thereof until the date of Completion of the Facilities pursuant to GCC 25 or, where the Contract provides for Completion of the Facilities in parts, until the date of Completion of the relevant part, and shall make good at its own cost any loss or damage that may occur to the Facilities or the relevant part thereof from any cause whatsoever during such period. The Contractor shall also be responsible for any loss or damage to the Facilities caused by the Contractor or its Subcontractors in the course of any work carried out, pursuant to GCC 28. Notwithstanding the foregoing, the Contractor shall not be liable for any loss or damage to the Facilities or that part thereof caused by reason of any of the matters specified or referred to in paragraphs (a), (b) and (c) of GCCs 33.2 and 39.1.
		33.2	If any loss or damage occurs to the Facilities or any part thereof or to the Contractor's temporary facilities by reason of (a) (insofar as they relate to the United Republic of Tanzania, where the Site is located) nuclear reaction, nuclear radiation, radioactive contamination, pressure wave caused by aircraft

			or other aerial objects, or any other occurrences that an experienced contractor could not reasonably foresee, or if reasonably foreseeable could not reasonably make provision for or insure against, insofar as such risks are not normally insurable on the insurance market and are mentioned in the general exclusions of the policy of insurance, including War Risks and Political Risks, taken out under GCC 35 hereof (b) any use or occupation by the Employer or any third party (other than a Subcontractor) authorized by the Employer of any part of the Facilities (c) any use of or reliance upon any design, data or specification provided or designated by or on behalf of the Employer, or any such matter for which the Contractor has disclaimed responsibility herein, the Employer shall pay to the Contractor all sums payable in respect of the Facilities executed, notwithstanding that the same be lost, destroyed or damaged, and will pay to the Contractor the replacement value of all temporary facilities and all parts thereof lost, destroyed or damaged. If the Employer requests the Contractor in writing to make good any loss or damage to the Facilities thereby occasioned, the Contractor shall make good the same at the cost of the Employer in accordance with GCC 40. If the Employer does not request the Contractor in writing to make good any loss or damage to the Facilities thereby occasioned, the Employer shall either request a change in accordance with GCC 40, excluding the performance of that part of the Facilities thereby lost, destroyed or damaged, or, where the loss or damage affects a substantial part of the Facilities, the Employer shall terminate the Contract pursuant to GCC 43.1 hereof.
		33.3	The Contractor shall be liable for any loss of or damage to any Contractor's Equipment, or any other property of the Contractor used or intended to be used for purposes of the Facilities, except (i) as mentioned in GCC 33.2 (with respect to the Contractor's temporary facilities), and (ii) where such loss or damage arises by reason of any of the matters specified in GCCs 33.2 (b) and (c) and 39.1.

		33.4	With respect to any loss or damage caused to the Facilities or any part thereof or to the Contractor's Equipment by reason of any of the matters specified in GCC 39.1, the provisions of GCC 39.3 shall apply.
34.	Loss of or Damage to Property; Accident or Injury to Workers; Indemnification	34.1	Subject to GCC 33.3, the Contractor shall indemnify and hold harmless the Employer and its employees and officers from and against any and all suits, actions or administrative proceedings, claims, demands, losses, damages, costs, and expenses of whatsoever nature, including attorney's fees and expenses, in respect of the death or injury of any person or loss of or damage to any property (other than the Facilities whether accepted or not), arising in connection with the supply and installation of the Facilities and by reason of the negligence of the Contractor or its Subcontractors, or their employees, officers or agents, except any injury, death or property damage caused by the negligence of the Employer, its contractors, employees, officers or agents.
		34.2	If any proceedings are brought or any claim is made against the Employer that might subject the Contractor to liability under GCC 34.1, the Employer shall promptly give the Contractor a notice thereof and the Contractor may at its own expense and in the Employer's name conduct such proceedings or claim and any negotiations for the settlement of any such proceedings or claim. If the Contractor fails to notify the Employer within twenty-eight (28) days after receipt of such notice that it intends to conduct any such proceedings or claim, then the Employer shall be free to conduct the same on its own behalf. Unless the Contractor has so failed to notify the Employer within the twenty-eight (28) day period, the Employer shall make no admission that may be prejudicial to the defense of any such proceedings or claim. The Employer shall, at the Contractor's request, afford all available assistance to the Contractor in conducting such proceedings or claim, and shall be reimbursed by the Contractor for all reasonable expenses incurred in so doing.
		34.3	The Employer shall indemnify and hold harmless the Contractor and its employees, officers and Subcontractors from any liability for loss of or damage to property of the Employer, other than the

			Facilities not yet taken over, that is caused by fire, explosion or any other perils, in excess of the amount recoverable from insurances procured under GCC 35, provided that such fire, explosion or other perils were not caused by any act or failure of the Contractor.
		34.4	The party entitled to the benefit of an indemnity under this GCC 34 shall take all reasonable measures to mitigate any loss or damage which has occurred. If the party fails to take such measures, the other party's liabilities shall be correspondingly reduced.
35.	Insurance	35.1	To the extent specified in the corresponding Appendix (Insurance Requirements) to the Agreement, the Contractor shall at its expense take out and maintain in effect, or cause to be taken out and maintained in effect, during the performance of the Contract, the insurances set forth below in the sums and with the deductibles and other conditions specified in the said Appendix. The identity of the insurers and the form of the policies shall be subject to the approval of the Employer, who should not unreasonably withhold such approval. (a) Cargo Insurance During Transport Covering loss or damage occurring while in transit from the Contractor's or Subcontractor's works or stores until arrival at the Site, to the Goods (including spare parts therefore) and to the Contractor's Equipment. (b) Installation All Risks Insurance Covering physical loss or damage to the Facilities at the Site, occurring prior to Completion of the Facilities, with an extended maintenance coverage for the Contractor's liability in respect of any loss or damage occurring during the Defect Liability Period while the Contractor is on the Site for the purpose of performing its obligations during the Defect Liability Period. (c) Third Party Liability Insurance Covering bodily injury or death suffered by third parties (including the Employer's personnel) and loss of or damage to property occurring in connection with the supply and installation of the

			Facilities. (d) Automobile Liability Insurance Covering use of all vehicles used by the Contractor or its Subcontractors (whether or not owned by them) in connection with the execution of the Contract. (e) Workers' Compensation In accordance with the statutory requirements applicable in United Republic of Tanzania. (f) Employer's Liability In accordance with the statutory requirements applicable in United Republic of Tanzania. (g) Other Insurances Such other insurances as may be specifically agreed upon by the parties hereto as listed in the said the corresponding Appendix.
		35.2	The Employer shall be named as co-insured under all insurance policies taken out by the Contractor pursuant to GCC 35.1, except for the Third Party Liability, Workers' Compensation and Employer's Liability Insurances, and the Contractor's Subcontractors shall be named as co-insured's under all insurance policies taken out by the Contractor pursuant to GCC 35.1 except for the Cargo Insurance During Transport, Workers' Compensation and Employer's Liability Insurances. All insurer's rights of subrogation against such co-insured's for losses or claims arising out of the performance of the Contract shall be waived under such policies.
		35.3	The Contractor shall, in accordance with the provisions of the corresponding Appendix (Insurance Requirements) to the Agreement, deliver to the Employer certificates of insurance (or copies of the insurance policies) as evidence that the required policies are in full force and effect. The certificates shall provide that no less than twenty-one (21) days' notice shall be given to the Employer by insurers prior to cancellation or material modification of a policy.
		35.4	The Contractor shall ensure that, where applicable, its Subcontractor(s) shall take out and maintain in

			effect adequate insurance policies for their personnel and vehicles and for work executed by them under the Contract, unless such Subcontractors are covered by the policies taken out by the Contractor.
		35.5	The Employer shall at its expense take out and maintain in effect during the performance of the Contract those insurances specified in the corresponding Appendix (Insurance Requirements) to the Agreement, in the sums and with the deductibles and other conditions specified in the said Appendix. The Contractor and the Contractor's Subcontractors shall be named as co-insured's under all such policies. All insurers' rights of subrogation against such co-insured's for losses or claims arising out of the performance of the Contract shall be waived under such policies. The Employer shall deliver to the Contractor satisfactory evidence that the required insurances are in full force and effect. The policies shall provide that not less than twenty-one (21) days' notice shall be given to the Contractor by all insurers prior to any cancellation or material modification of the policies. If so requested by the Contractor, the Employer shall provide copies of the policies taken out by the Employer under this GCC 35.5.
		35.6	If the Contractor fails to take out and/or maintain in effect the insurances referred to in GCC 35.1, the Employer may take out and maintain in effect any such insurances and may from time to time deduct from any amount due the Contractor under the Contract any premium that the Employer shall have paid to the insurer, or may otherwise recover such amount as a debt due from the Contractor. If the Employer fails to take out and/or maintain in effect the insurances referred to in GCC 35.5, the Contractor may take out and maintain in effect any such insurances and may from time to time deduct from any amount due the Employer under the Contract any premium that the Contractor shall have paid to the insurer, or may otherwise recover such amount as a debt due from the Employer. If the Contractor fails to or is unable to take out and maintain in effect any such insurances, the Contractor shall nevertheless have no liability or responsibility towards the Employer, and the Contractor shall have full recourse against the Employer for any and all liabilities of the Employer herein.

		35.7	Unless otherwise provided in the Contract, the Contractor shall prepare and conduct all and any claims made under the policies effected by it pursuant to this GCC 35, and all monies payable by any insurers shall be paid to the Contractor. The Employer shall give to the Contractor all such reasonable assistance as may be required by the Contractor. With respect to insurance claims in which the Employer's interest is involved, the Contractor shall not give any release or make any compromise with the insurer without the prior written consent of the Employer. With respect to insurance claims in which the Contractor's interest is involved, the Employer shall not give any release or make any compromise with the insurer without the prior written consent of the Contractor.
36.	**Unforeseen Conditions**	36.1	If, during the execution of the Contract, the Contractor shall encounter on the Site any physical conditions (other than climatic conditions) or artificial obstructions that could not have been reasonably foreseen prior to the date of the Agreement by an experienced contractor on the basis of reasonable examination of the data relating to the Facilities (including any data as to boring tests) provided by the Employer, and on the basis of information that it could have obtained from a visual inspection of the Site (if access thereto was available) or other data readily available to it relating to the Facilities, and if the Contractor determines that it will in consequence of such conditions or obstructions incur additional cost and expense or require additional time to perform its obligations under the Contract that would not have been required if such physical conditions or artificial obstructions had not been encountered, the Contractor shall promptly, and before performing additional work or using additional Goods or Contractor's Equipment, notify the Project Manager in writing of (a) the physical conditions or artificial obstructions on the Site that could not have been reasonably foreseen (b) the additional work and/or Goods and/or Contractor's Equipment required, including the steps which the Contractor will or proposes to take to overcome such conditions or obstructions (c) the extent of the anticipated delay

			(d) the additional cost and expense that the Contractor is likely to incur. On receiving any notice from the Contractor under this GCC 36.1, the Project Manager shall promptly consult with the Employer and Contractor and decide upon the actions to be taken to overcome the physical conditions or artificial obstructions encountered. Following such consultations, the Project Manager shall instruct the Contractor, with a copy to the Employer, of the actions to be taken.
		36.2	Any reasonable additional cost and expense incurred by the Contractor in following the instructions from the Project Manager to overcome such physical conditions or artificial obstructions referred to in GCC 36.1 shall be paid by the Employer to the Contractor as an addition to the Contract Price.
		36.3	If the Contractor is delayed or impeded in the performance of the Contract because of any such physical conditions or artificial obstructions referred to in GCC 36.1, the Time for Completion shall be extended in accordance with GCC 41.
37.	**Change in Laws and Regulations**	37.1	If, after the date twenty-eight (28) days prior to the date of Tender submission, in the United Republic of Tanzania, any law, regulation, ordinance, order or by-law having the force of law is enacted, promulgated, abrogated or changed (which shall be deemed to include any change in interpretation or application by the competent authorities) that subsequently affects the costs and expenses of the Contractor and/or the Time for Completion, the Contract Price shall be correspondingly increased or decreased, and/or the Time for Completion shall be reasonably adjusted to the extent that the Contractor has thereby been affected in the performance of any of its obligations under the Contract. Notwithstanding the foregoing, such additional or reduced costs shall not be separately paid or credited if the same has already been accounted for in the price adjustment provisions where applicable, in accordance with the SCC.
38.	**Force Majeure**	38.1	Force majeure shall include, without limitation, the following: (a) war, hostilities or warlike operations (whether a state of war be declared or not), invasion, act of foreign enemy and civil war

			(b) rebellion, revolution, insurrection, mutiny, usurpation of civil or military government, conspiracy, riot, civil commotion and terrorist acts (c) confiscation, nationalization, mobilization, commandeering or requisition by or under the order of any government or de jure or de facto authority or ruler or any other act or failure to act of any local state or national government authority (d) strike, sabotage, lockout, embargo, import restriction, port congestion, lack of usual means of public transportation and communication, industrial dispute, shipwreck, shortage or restriction of power supply, epidemics, quarantine and plague (e) earthquake, landslide, volcanic activity, fire, flood or inundation, tidal wave, typhoon or cyclone, hurricane, storm, lightning, or other inclement weather condition, nuclear and pressure waves or other natural or physical disaster (f) shortage of labour, materials or utilities where caused by circumstances that are themselves Force Majeure.
		38.2	If either party is prevented, hindered or delayed from or in performing any of its obligations under the Contract by an event of Force Majeure, then it shall notify the other in writing of the occurrence of such event and the circumstances thereof within fourteen (14) days after the occurrence of such event.
		38.3	The party who has given such notice shall be excused from the performance or punctual performance of its obligations under the Contract for so long as the relevant event of Force Majeure continues and to the extent that such party's performance is prevented, hindered or delayed. The Time for Completion shall be extended in accordance with GCC 41.
		38.4	The party or parties affected by the event of Force Majeure shall use reasonable efforts to mitigate the effect thereof upon its or their performance of the Contract and to fulfill its or their obligations under the Contract, but without prejudice to either party's right to terminate the Contract under GCCs 38.6 and 39.5.

		38.5	No delay or nonperformance by either party hereto caused by the occurrence of any event of Force Majeure shall (a) constitute a default or breach of the Contract (b) (subject to GCCs 33.2, 39.3 and 39.4) give rise to any claim for damages or additional cost or expense occasioned thereby if and to the extent that such delay or nonperformance is caused by the occurrence of an event of Force Majeure.
		38.6	If the performance of the Contract is substantially prevented, hindered or delayed for a single period of more than sixty (60) days or an aggregate period of more than one hundred and twenty (120) days on account of one or more events of Force Majeure during the currency of the Contract, the parties will attempt to develop a mutually satisfactory solution, failing which either party may terminate the Contract by giving a notice to the other, but without prejudice to either party's right to terminate the Contract under GCC 39.5.
		38.7	In the event of termination pursuant to GCC 38.6, the rights and obligations of the Employer and the Contractor shall be as specified in GCCs 43.1.2 and 43.1.3.
		38.8	Notwithstanding GCC 38.5, Force Majeure shall not apply to any obligation of the Employer to make payments to the Contractor herein.
39.	War Risks	39.1	"War Risks" shall mean any event specified in paragraphs (a) and (b) of GCC 38.1 and any explosion or impact of any mine, bomb, shell, grenade or other projectile, missile, munitions or explosive of war, occurring or existing in or near the United Republic of Tanzania where the Site is located.
		39.2	Notwithstanding anything contained in the Contract, the Contractor shall have no liability whatsoever for or with respect to (a) destruction of or damage to Facilities, Goods, or any part thereof (b) destruction of or damage to property of the Employer or any third party

			(c) injury or loss of life if such destruction, damage, injury or loss of life is caused by any War Risks, and the Employer shall indemnify and hold the Contractor harmless from and against any and all claims, liabilities, actions, lawsuits, damages, costs, charges or expenses arising in consequence of or in connection with the same.
		39.3	If the Facilities or any Goods or Contractor's Equipment or any other property of the Contractor used or intended to be used for the purposes of the Facilities shall sustain destruction or damage by reason of any War Risks, the Employer shall pay the Contractor for (a) any part of the Facilities or the Goods so destroyed or damaged (to the extent not already paid for by the Employer) (b) replacing or making good any Contractor's Equipment or other property of the Contractor so destroyed or damaged (c) replacing or making good any such destruction or damage to the Facilities or the Goods or any part thereof so far as may be required by the Employer, and as may be necessary for completion of the Facilities. If the Employer does not require the Contractor to replace or make good any such destruction or damage to the Facilities, the Employer shall either request a change in accordance with GCC 40, excluding the performance of that part of the Facilities thereby destroyed or damaged or, where the loss, destruction or damage affects a substantial part of the Facilities, shall terminate the Contract, pursuant to GCC 43.1.
		39.4	Notwithstanding anything contained in the Contract, the Employer shall pay the Contractor for any increased costs or incidentals to the execution of the Contract that are in any way attributable to, consequent on, resulting from, or in any way connected with any War Risks, provided that the Contractor shall as soon as practicable notify the Employer in writing of any such increased cost.
		39.5	If during the performance of the Contract any War Risks shall occur that financially or otherwise

			materially affect the execution of the Contract by the Contractor, the Contractor shall use its reasonable efforts to execute the Contract with due and proper consideration given to the safety of its and its Subcontractors' personnel engaged in the work on the Facilities, provided, however, that if the execution of the work on the Facilities becomes impossible or is substantially prevented for a single period of more than sixty (60) days or an aggregate period of more than one hundred and twenty (120) days on account of any War Risks, the parties will attempt to develop a mutually satisfactory solution, failing which either party may terminate the Contract by giving a notice to the other.
		39.6	In the event of termination pursuant to GCCs 39.3 or 39.5, the rights and obligations of the Employer and the Contractor shall be specified in GCCs 43.1.2 and 43.1.3.

H. Change in Contract Elements

40.	**Change in the Facilities**	40.	<u>Introducing a Change</u> 40.1.1 Subject to GCCs 40.2.5 and 40.2.7, the Employer shall have the right to propose, and subsequently require, that the Project Manager order the Contractor from time to time during the performance of the Contract to make any change, modification, addition or deletion to, in or from the Facilities (hereinafter called "Change"), provided that such Change falls within the general scope of the Facilities and does not constitute unrelated work and that it is technically practicable, taking into account both the state of advancement of the Facilities and the technical compatibility of the Change envisaged with the nature of the Facilities as specified in the Contract. 40.1.2 The Contractor may from time to time during its performance of the Contract propose to the Employer (with a copy to the Project Manager) any Change that the Contractor considers necessary or desirable to improve the quality, efficiency or safety of the Facilities. The Employer may at its discretion approve or reject any Change proposed by the Contractor, provided that the Employer shall approve any Change proposed by the Contractor to ensure

			the safety of the Facilities. 40.1.3 Notwithstanding GCCs 40.1.1 and 40.1.2, no change made necessary because of any default of the Contractor in the performance of its obligations under the Contract shall be deemed to be a Change, and such change shall not result in any adjustment of the Contract Price or the Time for Completion. 40.1.4 The procedure on how to proceed with and execute Changes is specified in GCCs 40.2 and 40.3, and further details and sample forms are provided in the Sample Forms and Procedures section in the Tendering Documents.
		40.	Changes Originating from Employer 39.2.1 If the Employer proposes a Change pursuant to GCC 40.1.1, it shall send to the Contractor a "Request for Change Proposal," requiring the Contractor to prepare and furnish to the Project Manager as soon as reasonably practicable a "Change Proposal," which shall include the following: (a) brief description of the Change (b) effect on the Time for Completion (c) estimated cost of the Change (d) effect on Functional Guarantees (if any) (e) effect on any other provisions of the Contract. 39.2.2 Prior to preparing and submitting the "Change Proposal," the Contractor shall submit to the Project Manager an "Estimate for Change Proposal," which shall be an estimate of the cost of preparing and submitting the Change Proposal. Upon receipt of the Contractor's Estimate for Change Proposal, the Employer shall do one of the following: (a) accept the Contractor's estimate with instructions to the Contractor to proceed with the preparation of the Change Proposal (b) advise the Contractor of any part of its Estimate for Change Proposal that is

			unacceptable and request the Contractor to review its estimate (c) advise the Contractor that the Employer does not intend to proceed with the Change. 40.2.3 Upon receipt of the Employer's instruction to proceed under GCC 40.2.2 (a), the Contractor shall, with proper expedition, proceed with the preparation of the Change Proposal, in accordance with GCC 40.2.1. 40.2.4 The pricing of any Change shall, as far as practicable, be calculated in accordance with the rates and prices included in the Contract. If such rates and prices are inequitable, the parties thereto shall agree on specific rates for the valuation of the Change. 40.2.5 If before or during the preparation of the Change Proposal it becomes apparent that the aggregate effect of compliance therewith and with all other Change Orders that have already become binding upon the Contractor under this GCC 40 would be to increase or decrease the Contract Price as originally set forth in Article 2 (Contract Price) of the Agreement by more than fifteen percent (15%), the Contractor may give a written notice of objection thereto prior to furnishing the Change Proposal as aforesaid. If the Employer accepts the Contractor's objection, the Employer shall withdraw the proposed Change and shall notify the Contractor in writing thereof. The Contractor's failure to so object shall neither affect its right to object to any subsequent requested Changes or Change Orders herein, nor affect its right to take into account, when making such subsequent objection, the percentage increase or decrease in the Contract Price that any Change not objected to by the Contractor represents. 40.2.6 Upon receipt of the Change Proposal, the Employer and the Contractor shall mutually agree upon all matters therein contained. Within fourteen (14) days after such agreement, the Employer shall, if it intends to proceed with the Change, issue the Contractor with a Change Order.

			If the Employer is unable to reach a decision within fourteen (14) days, it shall notify the Contractor with details of when the Contractor can expect a decision. If the Employer decides not to proceed with the Change for whatever reason, it shall, within the said period of fourteen (14) days, notify the Contractor accordingly. Under such circumstances, the Contractor shall be entitled to reimbursement of all costs reasonably incurred by it in the preparation of the Change Proposal, provided that these do not exceed the amount given by the Contractor in its Estimate for Change Proposal submitted in accordance with GCC 40.2.2. 40.2.7 If the Employer and the Contractor cannot reach agreement on the price for the Change, an equitable adjustment to the Time for Completion, or any other matters identified in the Change Proposal, the Employer may nevertheless instruct the Contractor to proceed with the Change by issue of a "Pending Agreement Change Order." Upon receipt of a Pending Agreement Change Order, the Contractor shall immediately proceed with effecting the Changes covered by such Order. The parties shall thereafter attempt to reach agreement on the outstanding issues under the Change Proposal. If the parties cannot reach agreement within sixty (60) days from the date of issue of the Pending Agreement Change Order, then the matter may be referred to the Adjudicator in accordance with the provisions of GCC 6.1.
		40.	<u>Changes Originating from Contractor</u> 40.3.1 If the Contractor proposes a Change pursuant to GCC 40.1.2, the Contractor shall submit to the Project Manager a written "Application for Change Proposal," giving reasons for the proposed Change and including the information specified in GCC 40.2.1. 40.3.2 Upon receipt of the Application for Change Proposal, the parties shall follow the procedures outlined in GCCs 40.2.6 and 40.2.7. However, should the Employer choose

			not to proceed, the Contractor shall not be entitled to recover the costs of preparing the Application for Change Proposal.
41.	**Extension of Time for Completion**	41.1	The Time(s) for Completion specified in the SCC shall be extended if the Contractor is delayed or impeded in the performance of any of its obligations under the Contract by reason of any of the following: (a) any Change in the Facilities as provided in GCC 40 (b) any occurrence of Force Majeure as provided in GCC 38, unforeseen conditions as provided in GCC 36, or other occurrence of any of the matters specified or referred to in paragraphs (a), (b) and (c) of GCC 33.2 (c) any suspension order given by the Employer under GCC 42 hereof or reduction in the rate of progress pursuant to GCC 42.2 or (d) any changes in laws and regulations as provided in GCC 37 or (e) any default or breach of the Contract by the Employer, specifically including failure to supply the items listed in the corresponding Appendix (Scope of Works and Supply by the Employer) to the Agreement, or any activity, act or omission of any other contractors employed by the Employer or (f) any other matter specifically mentioned in the Contract by such period as shall be fair and reasonable in all the circumstances and as shall fairly reflect the delay or impediment sustained by the Contractor.
		41.2	Except where otherwise specifically provided in the Contract, the Contractor shall submit to the Project Manager a notice of a claim for an extension of the Time for Completion, together with particulars of the event or circumstance justifying such extension as soon as reasonably practicable after the commencement of such event or circumstance. As soon as reasonably practicable after receipt of such notice and supporting particulars of the claim, the Employer and the Contractor shall agree upon the period of such extension. In the event that the Contractor does not accept the Employer's estimate of a fair and reasonable time extension, the Contractor shall be entitled to refer the matter to an Adjudicator, pursuant to GCC 6.1.

		41.1	The Contractor shall at all times use its reasonable efforts to minimize any delay in the performance of its obligations under the Contract.
42.	Suspension	42.1	The Employer may request the Project Manager, by notice to the Contractor, to order the Contractor to suspend performance of any or all of its obligations under the Contract. Such notice shall specify the obligation of which performance is to be suspended, the effective date of the suspension and the reasons thereof. The Contractor shall thereupon suspend performance of such obligation (except those obligations necessary for the care or preservation of the Facilities) until ordered in writing to resume such performance by the Project Manager. If, by virtue of a suspension order given by the Project Manager, other than by reason of the Contractor's default or breach of the Contract, the Contractor's performance of any of its obligations is suspended for an aggregate period of more than ninety (90) days, then at any time thereafter and provided that at that time such performance is still suspended, the Contractor may give a notice to the Project Manager requiring that the Employer shall, within twenty-eight (28) days of receipt of the notice, order the resumption of such performance or request and subsequently order a change in accordance with GCC 40, excluding the performance of the suspended obligations from the Contract. If the Employer fails to do so within such period, the Contractor may, by a further notice to the Project Manager, elect to treat the suspension, where it affects a part only of the Facilities, as a deletion of such part in accordance with GCC 40 or, where it affects the whole of the Facilities, as termination of the Contract under GCC 43.1.
		42.2	If: (a) the Employer has failed to pay the Contractor any sum due under the Contract within the specified period, has failed to approve any invoice or supporting documents without just cause pursuant to the corresponding Appendix (Terms and Procedures of Payment) to the Agreement, or commits a substantial breach of the Contract, the Contractor may give a notice to the Employer that requires payment of such sum, with interest thereon as stipulated in GCC

			13.3, requires approval of such invoice or supporting documents, or specifies the breach and requires the Employer to remedy the same, as the case may be. If the Employer fails to pay such sum together with such interest, fails to approve such invoice or supporting documents or give its reasons for withholding such approval, or fails to remedy the breach or take steps to remedy the breach within fourteen (14) days after receipt of the Contractor's notice or (b) the Contractor is unable to carry out any of its obligations under the Contract for any reason attributable to the Employer, including but not limited to the Employer's failure to provide possession of or access to the Site or other areas in accordance with GCC 11.2, or failure to obtain any governmental permit necessary for the execution and/or completion of the Facilities, then the Contractor may by fourteen (14) days' notice to the Employer suspend performance of all or any of its obligations under the Contract, or reduce the rate of progress.
		42.	If the Contractor's performance of its obligations is suspended or the rate of progress is reduced pursuant to this GCC 42, then the Time for Completion shall be extended in accordance with GCC 41.1, and any and all additional costs or expenses incurred by the Contractor as a result of such suspension or reduction shall be paid by the Employer to the Contractor in addition to the Contract Price, except in the case of suspension order or reduction in the rate of progress by reason of the Contractor's default or breach of the Contract.
		42.	During the period of suspension, the Contractor shall not remove from the Site any Goods, any part of the Facilities or any Contractor's Equipment, without the prior written consent of the Employer.
43.	**Termination**	43.	<u>Termination for Employer's Convenience</u> 434.1.1 The Employer may at any time terminate the Contract for any reason by giving the Contractor a notice of termination that refers to this GCC 43.1. 43.1.2 Upon receipt of the notice of termination under GCC 43.1.1, the Contractor shall either immediately or upon the date specified in the

			notice of termination (a) cease all further work, except for such work as the Employer may specify in the notice of termination for the sole purpose of protecting that part of the Facilities already executed, or any work required to leave the Site in a clean and safe condition (b) terminate all subcontracts, except those to be assigned to the Employer pursuant to paragraph (d) (ii) below (c) remove all Contractor's Equipment from the Site, repatriate the Contractor's and its Subcontractors' personnel from the Site, remove from the Site any wreckage, rubbish and debris of any kind, and leave the whole of the Site in a clean and safe condition (d) In addition, the Contractor, subject to the payment specified in GCC 43.1.3, shall (i) deliver to the Employer the parts of the Facilities executed by the Contractor up to the date of termination (ii) to the extent legally possible, assign to the Employer all right, title and benefit of the Contractor to the Facilities and to the Goods as of the date of termination, and, as may be required by the Employer, in any subcontracts concluded between the Contractor and its Subcontractors (iii) deliver to the Employer all non-proprietary drawings, specifications and other documents prepared by the Contractor or its Subcontractors as at the date of termination in connection with the Facilities. 43.1.3 In the event of termination of the Contract under GCC 43.1.1, the Employer shall pay to the Contractor the following amounts: (a) the Contract Price, properly attributable to the parts of the Facilities executed by the Contractor as of the date of termination (b) the costs reasonably incurred by the

			Contractor in the removal of the Contractor's Equipment from the Site and in the repatriation of the Contractor's and its Subcontractors' personnel (c) any amounts to be paid by the Contractor to its Subcontractors in connection with the termination of any subcontracts, including any cancellation charges (d) costs incurred by the Contractor in protecting the Facilities and leaving the Site in a clean and safe condition pursuant to paragraph (a) of GCC 43.1.2 (e) the cost of satisfying all other obligations, commitments and claims that the Contractor may in good faith have undertaken with third parties in connection with the Contract and that are not covered by paragraphs (a) through (d) above.
		43.	<u>Termination for Contractor's Default</u> 43.2.1 The Employer, without prejudice to any other rights or remedies it may possess, may terminate the Contract forthwith in the following circumstances by giving a notice of termination and its reasons thereof to the Contractor, referring to this GCC 43.2: (a) if the Contractor becomes bankrupt or insolvent, has a receiving order issued against it, compounds with its creditors, or, if the Contractor is a corporation, a resolution is passed or order is made for its winding up (other than a voluntary liquidation for the purposes of amalgamation or reconstruction), a receiver is appointed over any part of its undertaking or assets, or if the Contractor takes or suffers any other analogous action in consequence of debt (b) if the Contractor assigns or transfers the Contract or any right or interest therein in violation of the provision of GCC 44. (c) if the Contractor, in the judgment of the Employer has engaged in corrupt, coercive, collusive, obstructive or fraudulent practices in competing for or in executing the Contract.

			For the purpose of this paragraph: i. "corrupt practice means the offering, giving receiving or soliciting of anything of value to influence the action of a public officer in the procurement process or contract execution; ii. "coercive practice" means impairing or harming, or threatening to impair or harm directly or indirectly, any party or the property of the party for the purpose of influencing improperly the action or that party in connection with public procurement or in furtherance of corrupt practice or fraudulent practice; iii. collusive practices" means impairing or harming, or threatening to impair or harm directly or indirectly, any part or the property of the Party for the purpose of influencing improperly the action or a part or in connection with public procurement or government contracting or in furtherance of a corrupt practice or a Fraudulent Practice iv. "fraudulent practice" means a misrepresentation of facts in order to influence a procurement process or the execution of a contract to the detriment of the Government or a public body and includes collusive practices among tenderers, prior to or after submission designed to establish tender prices at artificial non-competitive levels and to deprive the Government of the benefits of free and open competition; v. "obstructive practice" means acts intended to materially impede access to required information in exercising a duty under this Act; 43.2.2 If the Contractor (a) has abandoned or repudiated the Contract (b) has without valid reason failed to commence work on the Facilities promptly or has suspended (other than pursuant to

			GCC 42.2) the progress of Contract performance for more than twenty-eight (28) days after receiving a written instruction from the Employer to proceed (c) persistently fails to execute the Contract in accordance with the Contract or persistently neglects to carry out its obligations under the Contract without just cause (d) refuses or is unable to provide sufficient materials, services or labour to execute and complete the Facilities in the manner specified in the programme furnished under GCC 19.2 at rates of progress that give reasonable assurance to the Employer that the Contractor can attain Completion of the Facilities by the Time for Completion as extended, then the Employer may, without prejudice to any other rights it may possess under the Contract, give a notice to the Contractor stating the nature of the default and requiring the Contractor to remedy the same. If the Contractor fails to remedy or to take steps to remedy the same within fourteen (14) days of its receipt of such notice, then the Employer may terminate the Contract forthwith by giving a notice of termination to the Contractor that refers to this GCC 43.2. 43.2.3 Upon receipt of the notice of termination under GCCs 43.2.1 or 43.2.2, the Contractor shall, either immediately or upon such date as is specified in the notice of termination, (a) cease all further work, except for such work as the Employer may specify in the notice of termination for the sole purpose of protecting that part of the Facilities already executed, or any work required to leave the Site in a clean and safe condition (b) terminate all subcontracts, except those to be assigned to the Employer pursuant to paragraph (d) below (c) deliver to the Employer the parts of the Facilities executed by the Contractor up to the date of termination (d) to the extent legally possible, assign to the

			Employer all right, title and benefit of the Contractor to the Facilities and to the Goods as of the date of termination, and, as may be required by the Employer, in any subcontracts concluded between the Contractor and its Subcontractors (e) deliver to the Employer all drawings, specifications and other documents prepared by the Contractor or its Subcontractors as of the date of termination in connection with the Facilities. 43.2.4 The Employer may enter upon the Site, expel the Contractor, and complete the Facilities itself or by employing any third party. The Employer may, to the exclusion of any right of the Contractor over the same, take over and use with the payment of a fair rental rate to the Contractor, with all the maintenance costs to the account of the Employer and with an indemnification by the Employer for all liability including damage or injury to persons arising out of the Employer's use of such equipment, any Contractor's Equipment owned by the Contractor and on the Site in connection with the Facilities for such reasonable period as the Employer considers expedient for the supply and installation of the Facilities. Upon completion of the Facilities or at such earlier date as the Employer thinks appropriate, the Employer shall give notice to the Contractor that such Contractor's Equipment will be returned to the Contractor at or near the Site and shall return such Contractor's Equipment to the Contractor in accordance with such notice. The Contractor shall thereafter without delay and at its cost remove or arrange removal of the same from the Site. 43.2.5 Subject to GCC 43.2.6, the Contractor shall be entitled to be paid the Contract Price attributable to the Facilities executed as of the date of termination, the value of any unused or partially used Goods on the Site, and the costs, if any, incurred in protecting the Facilities and in leaving the Site in a clean and safe condition pursuant to paragraph (a) of GCC 43.2.3. Any sums due the Employer from the Contractor

			accruing prior to the date of termination shall be deducted from the amount to be paid to the Contractor under this Contract. 43.2.6 If the Employer completes the Facilities, the cost of completing the Facilities by the Employer shall be determined. If the sum that the Contractor is entitled to be paid, pursuant to GCC 43.2.5, plus the reasonable costs incurred by the Employer in completing the Facilities, exceeds the Contract Price, the Contractor shall be liable for such excess. If such excess is greater than the sums due the Contractor under GCC 43.2.5, the Contractor shall pay the balance to the Employer, and if such excess is less than the sums due the Contractor under GCC 43.2.5, the Employer shall pay the balance to the Contractor. The Employer and the Contractor shall agree, in writing, on the computation described above and the manner in which any sums shall be paid.
		43.	<u>Termination by Contractor</u> 43.3.1 If (a) the Employer has failed to pay the Contractor any sum due under the Contract within the specified period, has failed to approve any invoice or supporting documents without just cause pursuant to the corresponding Appendix (Terms and Procedures of Payment) of the Agreement, or commits a substantial breach of the Contract, the Contractor may give a notice to the Employer that requires payment of such sum, with interest thereon as stipulated in GCC 13.3, requires approval of such invoice or supporting documents, or specifies the breach and requires the Employer to remedy the same, as the case may be. If the Employer fails to pay such sum together with such interest, fails to approve such invoice or supporting documents or give its reasons for withholding such approval, fails to remedy the breach or take steps to remedy the breach within fourteen (14) days after

			receipt of the Contractor's notice, or (b) the Contractor is unable to carry out any of its obligations under the Contract for any reason attributable to the Employer, including but not limited to the Employer's failure to provide possession of or access to the Site or other areas or failure to obtain any governmental permit necessary for the execution and/or completion of the Facilities, then the Contractor may give a notice to the Employer thereof, and if the Employer has failed to pay the outstanding sum, to approve the invoice or supporting documents, to give its reasons for withholding such approval, or to remedy the breach within twenty-eight (28) days of such notice, or if the Contractor is still unable to carry out any of its obligations under the Contract for any reason attributable to the Employer within twenty-eight (28) days of the said notice, the Contractor may by a further notice to the Employer referring to this GCC 43.3.1, forthwith terminate the Contract. 43.3.2 The Contractor may terminate the Contract forthwith by giving a notice to the Employer to that effect, referring to this GCC 43.3.2, if the Employer becomes bankrupt or insolvent, has a receiving order issued against it, compounds with its creditors, or, being a corporation, if a resolution is passed or order is made for its winding up (other than a voluntary liquidation for the purposes of amalgamation or reconstruction), a receiver is appointed over any part of its undertaking or assets, or if the Employer takes or suffers any other analogous action in consequence of debt. 43.3.3 If the Contract is terminated under GCCs 43.3.1 or 43.3.2, then the Contractor shall immediately (a) cease all further work, except for such work as may be necessary for the purpose of protecting that part of the Facilities already executed, or any work required to leave the Site in a clean and safe condition

			(b) terminate all subcontracts, except those to be assigned to the Employer pursuant to paragraph (d) (ii) (c) remove all Contractor's Equipment from the Site and repatriate the Contractor's and its Subcontractors' personnel from the Site. (d) In addition, the Contractor, subject to the payment specified in GCC 43.3.4, shall (i) deliver to the Employer the parts of the Facilities executed by the Contractor up to the date of termination (ii) to the extent legally possible, assign to the Employer all right, title and benefit of the Contractor to the Facilities and to the Goods as of the date of termination, and, as may be required by the Employer, in any subcontracts concluded between the Contractor and its Subcontractors (iii) deliver to the Employer all drawings, specifications and other documents prepared by the Contractor or its Subcontractors as of the date of termination in connection with the Facilities. 43.3.4 If the Contract is terminated under GCCs 43.3.1 or 43.3.2, the Employer shall pay to the Contractor all payments specified in GCC 43.1.3, and reasonable compensation for all loss, except for loss of profit, or damage sustained by the Contractor arising out of, in connection with or in consequence of such termination. 43.3.5 Termination by the Contractor pursuant to this GCC 43.3 is without prejudice to any other rights or remedies of the Contractor that may be exercised in lieu of or in addition to rights conferred by GCC 43.3.
		43.	In this GCC 43, the expression "Facilities executed" shall include all work executed, Installation Services provided, and all Goods acquired (or subject to a legally binding obligation to purchase) by the Contractor and used or intended to be used for the purpose of the Facilities, up to and including the date

			of termination.
		43.	In this GCC 43, in calculating any monies due from the Employer to the Contractor, account shall be taken of any sum previously paid by the Employer to the Contractor under the Contract, including any advance payment paid pursuant to the corresponding Appendix (Terms and Procedures of Payment) to the Agreement.
44.	**Assignment**	44.	Neither the Employer nor the Contractor shall, without the express prior written consent of the other party (which consent shall not be unreasonably withheld), assign to any third party the Contract or any part thereof, or any right, benefit, obligation or interest therein or thereunder, except that the Contractor shall be entitled to assign either absolutely or by way of charge any monies due and payable to it or that may become due and payable to it under the Contract.

LETTER OF ACCEPTANCE

UNITED REPUBLIC OF TANZANIA
MINISTRY OF HEALTH

Telephone Address: **"HEALTH"**,
Telephone: +255 23 2402136
Email: tumbirrh@afya.go.tz

The Office of Medical Officer In charge
Tumbi Regional Referral Hospital
P.O Box 30041
Kibaha - Pwani

In reply please quote:
Ref.No. MNH/CSO/TENDER/VOL IV/197/2022 Date: 8/03/2022

MANAGING DIRECTOR
PACIFIC DIAGNOSTICS LIMITED,
P.O Box 34056,
DAR ES SALAAM,
TANZANIA

RE: LETTER OF ACCEPTANCE

Reference is made to the above subject.

This is to notify you that your Tender dated 21th February, 2022 for execution of the Tender No PA/009/2021-22/HQ/G/06 LOT 15 for Supply, Install, Test, Train and Commission of CT SCAN Machine for Tumbi RRH for the Contract Price of the equivalent of Tshs 1,850,000,000.00 (Tanzanian Shillings one Billion Eighty Hundred Fifty Million Only) VAT Exclusive as per virtue of Item 14 of Part B of the Fifth Schedule to the East African Community Customs Management Act, 2004 and Item 7 of Part I of the exemption Schedule to the VAT Act, 2014, as corrected and modified in accordance with the ITT is hereby accepted by us.

We hereby confirm Tanzania Institute of Arbitrators, the Appointing Authority, who will appoint the Adjudicator in case of any arisen disputes in accordance with ITT 45.1.

You are hereby informed that after you have read and return the attached draft Contract, the parties to the contract shall sign the vetted contract within fourteen (14) working days.

You are hereby informed to proceed with the execution of the said Contract for the Supply and Installation in accordance with the terms and conditions of the signed Contract.

Authorized Signature: _____

Name and Title of Signatory: DR AMANI MALIMA MOI

Name of Agency: TUMBI REGIONAL REFERRAL HOSPITAL

Attachment: Contract

Copy: Appointing Authority, PPRA, TAU, CAG & Attorney General.

Note: You are required to submit the Performance Security before Commencement of the contract.

TECHNICAL SPECIFICATIONS AND COMPLIANCE TO SPECIFICATIONS

SUPPLY, INSTALL, TEST, TRAIN AND COMMISSION MEDICAL EQUIPMENTS

A. TUMBI REGIONAL REFERAL HOSPITAL REQUIREMENTS		
S/No	**Item Description**	**Qty**
1	CT SCAN 64 Slices	1

TECHNICAL SPECIFICATIONS AND DRAWINGS

CT 64 SLICES TECHNICAL SPECIFICATIONS

CT scan 64 Slices specifications

Level of use: Regional Referral Hospital and above

64 Slice CT-Scan. 2 years warranty, three years comprehensive Maintenance and spare parts inclusive.

The system shall be of latest technology allowing full and continuous rotation, multi-slice scanning (**64 slice acquisition per rotation**) with true isotropic volume acquisition and **best resolution of at least 0.4mm for body**, cardiac and vascular application. Pitch to be specified used for each application to achieve the resolution. True future upgradability to higher slices per rotation and future applications should be possible. The speed should be adequate to **all body, neurological and cardiovascular examinations.**

Technical Specifications or Requirements:

A. CT EXAMINATIONS:

1. Head and Neck CT
2. Cardiothoracic CT
3. Abdominal CT
4. Pelvic CT

5.Spine CT

6.Musculoskeletal CT

7.CT Angiography

B. DETECTOR:

1. Should be 64 detectors array system
2. The detectors shall be large area detector with Z axis coverage of 38mm and/or above.
3. Detector system should not require frequent calibrations (at least once a month).
4. Specify the number of rows and the total number of detector cells (670 elements or more).

C. GANTRY:

1. Aperture: 70 cm or more
2. Control Panel: on either side
3. Entire range of rotation times for full 360 degree should be specified. Minimum rotation time should be 0.4 seconds or less for whole body application.
4. Should have positioning laser lights.
5. Maximum scan FOV should be at least 50 cm.
6. Tilt-Remote >= +/- 30 deg.

D. X-RAY GENERATOR:

1. High Frequency type
2. Power output 75KW or more to support continuous and sustained operation.

E. X-RAY TUBE:

1. Tube current : 30 to 600mA or more
2. Real Time mA modulation for dose regulation.
3. Tube Voltage: 80 to140 KV
4. Anode Heat Storage Capacity should be 6 MHU or more
5. Should have anode Temp Monitoring System.
6. Heat Dissipation: 1000 KHU or more
7. Specify Focal Spot size and number according to IEC recommendation.
8. The tube should have dynamic focal spots.
9. The X-ray cooling unit should be inbuilt in the gantry.
10. **Warranty of tube: Comprehensive warranty for all parts including x-ray tubes for at least 2 years irrespective of number of scans.**

F. PATIENT TABLE:

1. **Minimum Load capacity of at least 200Kg ±10% with 1 mm positioningaccuracy.**
2. Table speed: Horizontal up to 100mm or more/sec.
3. Vertical Table travel: 50mm/sec or more
4. Minimum table top height should be 55cm or less from the ground level for easy transportation of trauma patient.
5. Longitudinal Scan Range: at least 150cm or more
6. Manual movement of the table should be possible in case of power failure.
7. Reproducing positional accuracy should be mentioned.
8. Remote Up/down and forward /backward should be standard.
9. Facility of positioning aid for horizontal isocentric positioning of the patient.
10. Should have Carbon Fibre Table Top.

G. SPIRAL CT:

1. Scan Time: Minimum scan time 0.4 sec or less for full 360 deg rotation.
2. Min slice thickness should be 0.625 mm or less
3. Max slice thickness: 10 mm or more
4. Slice increment.-specify scan and selectable slice thickness
5. Pitch Factor (volume pitch): variable between 0.5 sec to 1.5 sec or more andshould be user selectable. Specify all possible pitch selections.
6. Single Continuous scan time should be at least 120 sec.
7. Should optimize radiation dose and resolution for each selection.
8. Bolus Triggered Spiral acquisition should be possible.
9. Facility of multi-spiral, bi-directional spirals and back to back spirals.
10. Facility for monitor contrast enhancement and automatically commencedscanning.

H. TOPOGRAM:

1. Length and width: Specify range
2. Scan Time: Specify range per examination/procedure
3. Views: Frontal & lateral views.
4. Should be able to interrupt acquisitions manually once the desired anatomy is obtained.

I. DATA ACQUISITION SYSTEM:

1. Detector should capable of acquiring 64 slices per 360 degree of rotation.
2. Number of rows with their thickness, number of element in each rows
3. Inbuilt mechanism for adapting the tube current during each scan this shouldenable radiation dosage reduction where body part thickness is less.
4. Detector system should not require frequent calibration.
5. Should have inbuilt paediatric protocols based on patient weight.

J. IMAGE RECONSTRUCTION:

1. Real Time reconstruction speed: 15 images per sec or more at 512x512 matrix.
2. Display Matrix: 1024x1024 or more
3. Reconstructed slice thickness: ≤1mm to 10mm.
4. Should have selectable Scan Field and reconstructed field.

K. OPERATOR CONSOLE:

1. Radiology Monitor Resolution: 1280x1240
2. Pixel Size < 0.3 mm.
3. Two Flat screens radiology grade LCD Type of at least 24" with fast image refreshrate should be fast and preferably instantaneous and flicker free.
4. Should be non-interlaced and progressive display type & sturdy.
5. Should perform Registration, scheduling, protocol selection , volume rendering, Volume measurements, Multiplan Reconstruction, and standard evaluation application and all available post processing functions without the help of thesatellite workstation as well as film exposure.
6. Should have 3GHz or latest processor with at least 16GB RAM.
7. Raw Data storage with at least 1TB Hard disc having a minimum of 1,500,000 images storing capacity in 512x512 format.
8. Additional external hard disk of minimum 2TB should be provided.
9. System should be menu driven operation. Applications like image reconstruction, filming, curve MPR, CT Angiography; VRT, auto bone removal.

10. Lung nodule evaluation software to be provided in workstation, and not in operator console.

L. CONSOLE COMMON FEATURE:

1. The workstation should be interconnected for two-way transfer of images and reports.
2. Spatial alignment and visualization of two different data sets of one patient generated on different modalities or with different acquisition time.
3. Cine display should be available, both interactive and automatic.
4. Window width and Centre should be freely selectable.
5. Patient online Registration, pre- registration facility and transfer of information from HIS/RIS via DICOM should be possible.
6. Should have dedicated pediatric protocol for low dose imaging.

M. WORKSTATIONS: Total two (1 at operator console room & 1 at Radiologist room)

1. Should have Flat screen Medical Diagnostic monitor (minimum 1Mega pixels coloured) of **at least 24"** with fast image refresh rate should be fast and preferably instantaneous and flicker free with Hard Disk of 1TB or more, capable of simultaneous viewing of all post processing functions and filming independently without the help of main console. Data transfer between the operator console & the satellite workstation should be instantaneous.

N. **Processor / Chipset CPU**: Intel Xeon E5-1650V2 / 3.5 GHz, Max Turbo Speed. 3.9 GHz, Number of Cores. 6-core, Chipset Type. Intel C602, Processor Main Features. Hyper-Threading Technology, Intel Turbo Boost Technology 2, Processor Socket. LGA2011 Socket,

1. **Operating System:** Licensed Windows 10 Professional
2. **Microsoft Office:** Microsoft Office 2019 Professional
3. **Antivirus:** Include antivirus software
4. **Radiology Monitor**
5. **Size:** 24 inch
6. **Backlight:** LED
7. **Native Resolution:** 1536 x 2048 (3:4 aspect ratio)
8. **Display Colors:** 10-bit (DisplayPort): 1.07 billion from a palette of 543 billion (13-bit) colors

   8-bit: 16.77 million from a palette of 543 billion (13-bit) colors
9. **Video Signals:** DisplayPort x 3, HDMI, DVI-D (dual link)
10. **USB:** 3 Ports of USB 3.0

11. **Certifications & Standards:** CE (Medical Device), EN60601-1, ANSI/AAMI ES60601-1, CSA C22.2 No. 601-1, IEC60601-1, VCCI-B, FCC-B, CAN ICES-3 (B), RCM, RoHS, China RoHS, WEEE, CCC, EAC

O. IMAGE EVALUATION TOOLS:

1. Parallel evaluation of multiple ROI in circle, irregular and polygonal forms.
2. Statistical Evaluation for area/ volume, S.D, Mean/Max and Histograms.
3. Profile cuts: horizontal, vertical and oblique views.
4. Distance & angle measurement, freely selectable positioning of co-ordinate system, grid and image annotation.
5. Dynamic evaluation of contrast enhancement in organs and tissues, calculation oftime-density, curves, peak enhancement images and time-to-peak images.

P. IMAGE QUALITY PARAMETER:

1. It should be specified at the lowest scan time available at the system.
2. High Contrast Spatial Resolution should be 17 LP/cm or higher (Mention slice thickness, scan time phantom, mA, scan field, dose and MTF) up to 10% full FOV.
3. Low contrast detect ability should be 5mm at difference using 20cm CATPHAN (please mention phantom, scan time, mA, filter for image reconstruction, scan field, dose, slice thickness).
4. High Contrast Resolution and Low Contrast Resolution for spiral must be same as that for axial.

Q. DOSE REDUCTION TECHNIQUE:

1. Should be available.
2. Pre-patient collimation to reduce unnecessary dose to patient.
3. Specify the Dose reduction software.

R. POST PROCESSING TOOLS:

1. 2-D, including image zoom and pan, image manipulations, including averaging, reversal of grey-scale values, and mirroring; image filter functions, including advanced smoothing algorithm and advanced bone correction.
2. Real-time multi-planar reconstruction (MPR) of secondary views, with viewing perspectives in all planes including curved & orthogonal MPR.
3. **Standard 3D applications:** CT angiography, MIP, MinIP, SSD, VRT, and other advanced **3D applications** and colour coding for different tissues.
4. Post Processing Software: Perfusion CT, Image Fusion, Image reconstruction, filming, Curve MPR, CT Angiography, Auto bone removal, Vessel segmentation, Virtual

Endoscopy software to be provided in all workstations.

5. Spatial alignment and visualization of two different data sets of one patient generated on different modalities or with different acquisition times.
6. Volume measurements.

S. PATIENT COMMUNICATION SYSTEM:

1. An integrated intercom and Automated Patient Instruction System (API) should be provided.

T. CONNECTIVITY AND ARCHIVAL

1. DICOM connectivity (latest version) should be compatible and optimised for networking with other imaging systems.
2. DICOM converters for linking the camera with other imaging systems of the department should be provided, if required separately.
3. It should have sufficient memory to store images from the CT as well as other systems connected to it.
4. Filming parallel to other activities, including independent scanning, documentation and post-processing and configurable image text.
5. Archiving: Multi - burner DVD/CD writer should be provided for archival. Specify minimum number of uncompressed and compressed images that it can store per disc.
6. Option of viewing these discs on any PC without DICOM viewer should be available.
7. Should be capable of IT system integration with PACS storage capacity of at least 30T.

U. UPGRADABILITY:

1. Software updates that enhance existing applications must be provided by the vendor indefinitely at **no cost to the purchaser**. These no charge updates shall include any circuit boards or parts if software is added to enhance existingcapabilities.
2. System should have capability to being upgraded as new technology emerges forat least 10 years
3. Additional or new software must have the capability of being downloaded byremote computer access. Software must include a free trial period before purchase.

V. POWER SUPPLY:

1. Power input to be 3 Phase, 380-480VAC, 50/60Hz, as appropriate fitted with for required items.
2. Suitable servo controller stabilizer provided with resettable over current breakershall be fitted for protection.
3. Online UPS of suitable rating for 30 minutes or more backup shall be supplied for thecomplete system including computers

W. ACCESSORIES, SPARES AND CONSUMABLES:

1. Standard Patient positioning accessories and restraining devices : 2 sets
2. Good quality light weight vinyl Lead Eye Goggles, Thyroid Shields, Aprons and of .5mm lead equivalent : 3 units each
3. Lead Glass 150x100cmx 2mm lead : 1 unit
4. Patient transport trolley : 2 units
5. Instrument trolley: 2 units Non Invasive Monitor of 12" screen with TFT colour display with the followingaccessories:

- Should be USFDA & CE (Notified body)
- ECG /Resp: 5 lead ECG cable with clip – 2 sets per monitor and 10 lead ECG cable with clip 1 set per monitor.
- NIBP: Adult cuff -2 units per monitor and two sizes of Pediatric Cuffs -oneper monitor. (Complete sets)
- SpO2: Adult SpO2 sensor with cable – two units per monitor and Pediatric SpO2 Sensors – one unit per monitor.
- Temperature: Central temperature Probe – two per monitor and Skin temperature probe – one unit per monitor

6. Defibrillator Monitor/ Inbuilt Recorder Biphasic with auto and manual mode up to360 Joule :

- Should be USFDA & CE (Notified body). It should be mains and battery operated.
- Should deliver at least 25 shocks with fully charged battery with the following accessories:
- Adult and paediatric paddle : 1 each
- Disposable pads: 10 units.

7. **Dual head Pressure Injector with the following:**

- Should be CE (Notified body) approved.
- Flow rate 0.1-10 ml/sec, Volume - 1 ml to syringe capacity, programmable pressure limit of 325 psi with 200 ml disposable sterile syringes. Syringe heater range 35 deg C+/- 5 deg C.
- Should be provided with head mounting device and integral IV pole.
- 1000 unit's syringes with tubing's to be provide with the machine.
- Unit will be provided with display monitor to provide Pressure Monitor graph, Flow Profile, Stop Watch Feature, Scan Display, multiphase capability and protocol locking capabilities.

8. **Other items to be supplied:**

- Post processing room chairs : 5 units
- Executive Chairs for reporting: 2 units
- Executive Tables for reporting : 2 units
- Patient waiting chairs : 8 units in 2 rows (4 Chairs in one row)
- One laptop and one laser printer with scanning & copy facility should be provided with latest specification for reporting & tele-radiology.

NB. The make & model of all the additional equipment should be specified in the compliance statement for the technical evaluation, assessment &record.

X. SITE:

1. A complete site preparation plan will be required to be submitted along with its financial components in separate cover. The vendor will be eligible to inspect the proposed site after obtaining permission. Care must be taken to address placement of the equipment, sitting, viewing and reporting area, patient preparation space, storage area etc.
2. Requirements of power and air conditioning must be clearly specified in aseparate section of the offer. The temperature of the gantry room to be maintained at 20^{0}C.

Y. WARRANTY & CMC:

- **Should have 2years warranty, and three years comprehensive and collective maintenance inclusive spare parts for entire CT system (X-ray TUBE and all accessories) including all turn key items (Patient Monitor, Defibrillator, Laser Imaging Camera, Digital film printer, Pressure Injector, UPS, Air Conditioner).**

Cost of CMC (Comprehensive Maintenance Contract) must be quoted in the price bid for the next 5 years after the expiration of the warranty period (i.e.: 6th, 7th, 8th, 9th, 10th).
Lifetime support; spare parts, consumables should be available throughout the lifetime period of the machine.

Uptake time should be a minimum of 90%.
Proof of locally available technical support personnel, including CVs and work permit for foreign personnel.

Availability of technical personnel within the country should be stated; this should include CVs, work permits for foreign personnel.
Software should be flexible and provide the room for upgrade to add new parameters to be measured by the Machine and report format.

Z. MANDATORY REQUIREMENTS:

Vendor shall have to process the documents and get all the necessary clearances of the unit from all regulatory authorities such as TAEC, TMDA and TBS.

AA. TRAINING & DOCUMENTATION:

- At least 2 weeks on site training by application specialist for two radiologists, two radiographers.
- At least 6 weeks certified Comprehensive service training for Biomedical Engineer at Manufacturer's site.
- Safety aspects of Radiation dosage leakage should be spelt out.
- User manual in English incorporating the newer applications.
- Service manual in English
- Log book with instruction for daily, weekly, monthly and quarterly maintenance checklist.
- The job description of the hospital technician and company service engineer should be clearly spelt out.
- Adequate books and journals within the warranty period

You are required to fill the table below as per specified details above

NB: Non declaration will lead to penalty or disqualification.

S/No.	Technical specification	Comply YES/NO	Specify/Detail

Pacific Diagnostics
medical imaging solutions

CT 64 SLICES TECHNICAL SPECIFICATIONS

Level of use: Regional Referral Hosptital and above

CT 64 Slices: 2 Years warranty, 5 Years Comprehensive Maintenance and spare parts inclusive

TENDER No. PA/009/2021-22/HQ/G/06 LOT 15

S/No.	Technical specification	Comply **YES/NO**	Specify/Detail
	The system shall be of latest technology allowing full and continuous rotation, multi-slice scanning (64 slice acquisition per rotation) with true isotropic volume acquisition and best resolution of at least 0.4mm for body, cardiac and vascular application. Pitch to be specified used for each application to achieve the resolution. True future upgradability to higher slices per rotation and future applications should be possible. The speed should be adequate to all body, neurological and cardiovascular examinations.	**YES**	The Siemens Somatom GO.TOP CT system is of latest technology allowing full and continuous rotation, multi- slice scanning (64 slice acquisition per rotation) with true isotropic volume acquisition and best resolution of 0.4mm for body, cardiac and vascular application. The Supplied Datasheet provides all the technical details of the CT Scanner. The rotational speed of 0.33 sec/rotation is one of the fatsest in the industry and is adequate to all body, neurological and cardiovascular examinations.
1	**CT EXAMINATIONS:**		The Following CT Examinations can be performed
	1. Head and Neck CT	YES	Head and Neck CT
	2. Cardiothoracic CT	YES	Cardiothoracic CT
	3. Abdominal CT	YES	Abdominal CT
	4. Pelvic CT	YES	Pelvic CT
	5. Spine CT	YES	Spine CT
	6. Musculoskeletal CT	YES	Musculoskelatal CT

P.O. Box 34056, Plot 46-48, Mikocheni Industrial Area, Opposite Coca-cola Kwanza Factory, Coca-cola Road.
Dar es Salaam, Tanzania
Email: info@pacificafrica.co.tz, Tel: +255 22 2701032, Fax: +255 22 2773440

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	7. CT Angiography	YES	CT Angiography including Cardiac Angiography.
2	**DETECTOR:**		
	1. Should be 64 detectors array system	YES	64 Row Array Detector System
	2. The detectors shall be large area detector with Z axis coverage of 38mm and/or above.	YES, Meets Specifications	Z Axis Coverage: 38.4 mm
	3. Detector system should not require frequent calibrations (at least once a month).	YES, Meets Specifications	The Detector system does not need frequent calibrations
	4. Specify the number of rows and the total number of detector cells (670 elements or more).	YES, Better than requested Specifications	Number of rows: 64 Number of detector cells per row: 840 Total Number of detector elements: 53,760
3	**GANTRY:**		
	1. Aperture: 70 cm or more	YES, Meets Specifications	Gantry Aperture 70 cm
	2. Control Panel: on either side	Yes, Meets Specifications	Mobile Workflow with 12" Tablet Operation: operator can stay mobile and prepare the entire protocol next to the patient.
	3. Entire range of rotation times for full 360 degree should be specified. Minimum rotation time should be 0.4 seconds or less for whole body application.	YES, Better than requested Specifications	Time for Full 360 degree rotation: 0.33 sec (Option is included)
	4. Should have positioning laser lights.	YES, Meets Specifications	3D Laser Positioning Lights in Axial, Coronal and Sagittal directions. In addition, Isocenter laser is also included.
	5. Maximum scan FOV should be at least 50 cm.	YES, Meets Specifications	Maximum scan FOV is 50cm.
	6. Tilt-Remote >= +/- 30 deg.	YES, Meets Specifications	Physical Tilt: +/- 30 degree.

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4	**X-RAY GENERATOR:**		
	1. High Frequency type	YES, Meets Specifications	Microprocessor Controlled High Frequency Generator.
	2. Power output 75KW or more to support continuous and sustained operation	YES, Meets Specifications	Actual Power Output 75kW; equivalent to 187 kW with SAFIRE
5	**X-RAY TUBE:**		
	1. Tube current : 30 to 600mA or more	Yes, Exceeds Specifications	13 - 625 mA; max. tube current equivalent to 1560 mA utilizing SAFIRE
	2. Real Time mA modulation for dose regulation.	YES, Meets Specifications	CARE Dose4D: Fully automated dose modulation solution. The algorithm automatically modulates tube current for optimum image quality.
	3. Tube Voltage: 80 to140 KV	Yes, Exceeds Specifications	70 to 140 kV
	4. Anode Heat Storage Capacity should be 6 MHU or more	Yes, Exceeds Specifications	7.0 MHU; equivalent to 17.5 MHU with SAFIRE
	5. Should have anode Temp Monitoring System.	YES, Meets Specifications	Inbuilt Anode and Tube temperature Monitoring System.
	6. Heat Dissipation: >=1000 KHU or more	Yes, Exceeds Specifications	1700 kHU
	7. Specify Focal Spot size and number according to IEC recommendation.	Yes	Focal spot size according to IEC 60336 • 0.8 x 0.8 / 7° • 1.0 x 1.2 / 7°
	8. The tube should have dynamic focal spots.	YES, Meets Specifications	Flying Focal Spots
	9. The X-ray cooling unit should be inbuilt in the gantry.	YES, Meets Specifications	The X-ray Tube Cooling System is inbuilt in the Gantry.

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	1. Scan Time: Minimum scan time 0.4 sec or less for full 360 deg rotation.	Yes, Exceeds Specifications	0.33 sec.
	2. Min slice thickness should be 0.625 mm or less	Yes, Exceeds Specifications	0.6mm
	3. Max slice thickness: 10 mm or more	YES, Meets Specifications	10 mm
	4. Slice increment.-specify scan and selectable slice thickness	YES, Meets Specifications	Sequence Acquisition Reconstructed slice widths 0.8, 1.0, 1.5, 2, 3, 4, 5, 6, 7, 8, 10 mm Multislice Spiral Acquisition Reconstructed slice widths 0.6, 0.8, 1, 1.5, 2, 3, 4, 5, 6, 7, 8, 10 mm
	5. Pitch Factor (volume pitch): variable between 0.5 sec to 1.5 sec or more and should be user selectable. Specify all possible pitch selections.	YES, Meets Specifications	Pitch factor • 0.15 – 1.5 • Down to 0.03. User Selectable. Pitch selection as per scan protocol. Exam Designer Easy and intuitive way to change and manage scan protocols
	6. Single Continuous scan time should be at least 120 sec.	Yes, Exceeds Specifications	300 seconds

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DAR-ES-SALAAM

	7. Should optimize radiation dose and resolution for each selection.	Yes, Exceeds Specifications	• X-CAREProvides organ dose reduction for radiation-sensitive peripheral organs e.g. eye lenses, while maintaining image quality.• Flex Dose Profile• CARE kV• 10 kV Steps• CARE Child• CARE Filter
	8. Bolus Triggered Spiral acquisition should be possible.	YES, Meets Specifications	CARE Bolus is included as standard
	9. Facility of multi-spiral, bi-directional spirals and back to back spirals.	YES, Meets Specifications	Multi-Spirals can be planned on the Topogram. Prospective or Retrospective (bi-directional) spirals and Back to back Spirals are possible.
	10. Facility for monitor contrast enhancement and automatically commenced scanning.	YES, Meets Specifications	Window Width and Center is possible for Monitor Contrast enhancement. Automatic commencement of scanning is possible.
9	**TOPOGRAM:**		
	1. Length and width: Specify range	Yes	Topogram Length • 128–1,680 mm Width: 70cm
	2. Scan Time: Specify range per examination/procedure	Yes	Scan times • 1.36–8.76 s Suitable for all Exams and procedures
	3. Views: Frontal & lateral views.	YES, Meets Specifications	Views a.p., p.a., lateral

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	4. Should be able to interrupt acquisitions manually once the desired anatomy is obtained	YES, Meets Specifications	CARE TopoManual interruption possible once desired anatomy has been imaged
10	**DATA ACQUISITION SYSTEM:**		
	1. Detector should capable of acquiring 64 slices per 360 degree of rotation.	YES, Meets Specifications	Acquiring 64 slices per 360 degree of rotation
	2. Number of rows with their thickness, number of element in each rows	YES	64 rows 840 elements per row 38.4mm total detector thickness Total Elements 53,760.
	3. Inbuilt mechanism for adapting the tube current during each scan this should enable radiation dosage reduction where body part thickness is less.	Yes, Exceeds Specifications	CARE Dose4D & Flex Dose Profile: Fully automated dose modulation solution. The algorithm automatically modulates tube current for optimum image quality and and accurate dose handling.
	4. Detector system should not require frequent calibration.	YES, Meets Specifications	The UFC Detector does not need frequent calibration.
	5. Should have inbuilt paediatric protocols based on patient weight.	YES, Meets Specifications	CARE Child protocol for Pediatric scans based on Patient weight. Dedicated pediatric protocols automatically set a low tube voltage – in most cases 70 kV – while CARE Dose4D optimizes dose distribution and offers special modulation curves.
11	**IMAGE RECONSTRUCTION:**		
	1. Real Time reconstruction speed: 15 images per sec or more at 512x512 matrix.	Yes, Exceeds Specifications	23 images/sec at 512 matrix
	2. Display Matrix: 1024x1024 or more	YES, Meets Specifications	Display Matrix 1024 x 1024
	3. Reconstructed slice thickness: ≤1mm to 10mm.	Yes, Exceeds Specifications	0.6mm to 10mm

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	4. Should have selectable Scan Field and reconstructed field	YES, Meets Specifications	Scan Field is selectable from Topogram. Reconstructed Field is also selectable from Topogram. It is also possible to carry out reconstruction from Raw data to user selectable Reconstruction Field width
12	**OPERATOR CONSOLE:**		
	1. Radiology Monitor Resolution: 1280x1240	YES, Meets Specifications	2560 x 1440 resolution.
	2. Pixel Size < 0.3 mm.	YES, Meets Specifications	0.2331 mm
	3. Two Flat screens radiology grade LCD Type of at least 24" with fast image refresh rate should be fast and preferably instantaneous and flicker free.	YES, Meets Specifications	Two Flat ScreenMedical Grade 4MP LCD monitors, High Resolution of 27" each, Flickerfree, 100 Hz monitors
	4. Should be non-interlaced and progressive display type & sturdy.	YES, Meets Specifications	Non-interlaced and Progressive Display. Sturdy design and robust construction, long life
	5. Should perform Registration, scheduling, protocol selection , volume rendering, Volume measurements, Multiplan Reconstruction, and standard evaluation application and all available post processing functions without the help of the satellite workstation as well as film exposure.	YES, Meets Specifications	Performs all the actions as described. No need of a Satellite Workstation. All Standard Evaluation and post-processing functions as well as Filming are available
	6. Should have 3GHz or latest processor with at least 16GB RAM.	Yes, Exceeds Specifications	High performance computer CPU Intel Xeon 3.5–4.0 GHz with Turbo Boost Technology 96 GB RAM
	7. Raw Data storage with at least 1TB Hard disc having a minimum of 1,500,000 images storing capacity in 512x512 format.	Yes, Meets Specifications	1.2TB with Image Storage of 1,500,000 images in 512 matrix
	8. Additional external hard disk of minimum 2TB should be provided.	YES, Meets Specifications	External Hard Disk of 2 TB will be supplied

	9. System should be menu driven operation. Applications like image reconstruction, filming, curve MPR, CT Angiography; VRT, auto bone removal.	YES, Meets Specifications	Menu Driven Applications for Image Reconstruction, MPR, CT Angio, VRT, Auto Bone removal, Filming and many more.
	10. Lung nodule evaluation software to be provided in workstation, and not in operator console.	YES, Meets Specifications	Lung Nodule Evaluation will be provided on the Workstation.
	CONSOLE COMMON FEATURE:		
	1. The workstation should be interconnected for two-way transfer of images and reports.	YES, Meets Specifications	The Workstations are connected to the Main console for two way transfer of Images and Reports.
	2. Spatial alignment and visualization of two different data sets of one patient generated on different modalities or with different acquisition time.	YES, Meets Specifications	Comparison of two datasets is possible, taken on different modalities or with different acquisition times
13	3. Cine display should be available, both interactive and automatic.	YES, Meets Specifications	CINE Display Display of image sequences Automatic or interactive with mouse control Max. image rate: 30 frames/s
	4. Window width and Centre should be freely selectable.	YES, Meets Specifications	Window Width and Center are freeley Selectable
	5. Patient online Registration, pre-registration facility and transfer of information from HIS/RIS via DICOM should be possible.	YES, Meets Specifications	These are Standard Features
	6. Should have dedicated pediatric protocol for low dose imaging.	YES, Meets Specifications	CARE Child, 70 kV for Pediatric and low dose imaging is available.
14	**WORKSTATIONS: Total two (1 at operator console room & 1 at Radiologist room)**	YES, Meets Specifications	Two Workstations, 1 at Operator Console and 1 at Radiologist room are included in Scope of Supply.

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	4. Radiology Monitor		
	5. Size: 24 inch	YES, Meets Specifications	30 inch
	6. Backlight: LED	YES, Meets Specifications	Backlight LED
	7. Native Resolution: 1536 x 2048 (3:4 aspect ratio)	YES, Meets Specifications	30" Monitor with 3280 x 2048 resolotion 6MP will be supplied.
	8. Display Colors: 10-bit (DisplayPort): 1.07 billion from a palette of 543 billion (13-bit) colors	YES, Meets Specifications	10-bit (DisplayPort): 1.07 billion from a palette of 543 billion (13-bit) colors.
	8-bit: 16.77 million from a palette of 543 billion (13-bit) colors	YES, Meets Specifications	8-bit: 16.77 million from a palette of 543 billion (13-bit) colors
	9. Video Signals: DisplayPort x 3, HDMI, DVI-D (dual link)	YES, Meets Specifications	Video Signals: DisplayPort x 3, HDMI, DVI-D (dual link)
	10. **USB:** 3 Ports of USB 3.0	YES, Meets Specifications	The Workstation CPU will have 2 USB 3.2 Gen 2 Type-A ports 2 USB 3.2 Gen 1 Type-A ports
	Certifications & Standards: CE (Medical Device), EN60601-1, ANSI/AAMI ES60601-1, CSA C22.2 No. 601-1, IEC60601-1, VCCI-B, FCC-B, CAN ICES-3 (B), RCM, RoHS, China RoHS, WEEE, CCC, EAC	YES, Meets Specifications	CE (Medical Device), EN60601-1, ANSI/AAMI ES60601-1, CSA C22.2 No. 601-1, IEC60601-1, VCCI-B, FCC-B, CAN ICES-3 (B), RCM, RoHS, China RoHS, WEEE, CCC, EAC
15	**IMAGE EVALUATION TOOLS:**		
	1. Parallel evaluation of multiple ROI in circle, irregular and polygonal forms.	YES, Meets Specifications	Parallel evaluation of multiple ROI in circle, irregular and polygonal forms.
	2. Statistical Evaluation for area/ volume, S.D, Mean/Max and Histograms.	YES, Meets Specifications	Statistical Evaluation for area/ volume, S.D, Mean/Max and Histograms
	3. Profile cuts: horizontal, vertical and oblique views.	YES, Meets Specifications	Profile cuts: horizontal, vertical and oblique views.

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	4. Distance & angle measurement, freely selectable positioning of co-ordinate system, grid and image annotation.	YES, Meets Specifications	Distance & angle measurement, freely selectable positioning of co-ordinate system, grid and image annotation
	5. Dynamic evaluation of contrast enhancement in organs and tissues, calculation of time-density, curves, peak enhancement images and time-to-peak images.	YES, Meets Specifications	Dynamic evaluation of contrast enhancement in organs and tissues, calculation of time-density, curves, peak enhancement images and time-to-peak images.
16	**IMAGE QUALITY PARAMETER:**		
	1. It should be specified at the lowest scan time available at the system.	YES, Meets Specifications	Specified at 0.33 sec.
	2. High Contrast Spatial Resolution should be 17 LP/cm or higher (Mention slice thickness, scan time phantom, mA, scan field, dose and MTF) up to 10% full FOV.	YES, Meets Specifications	High-contrast Resolution• 0% MTF 17 LP/cm (± 10%)• 2% MTF 15.1 lp/cm (± 10%)• 10% MTF 14.6 lp/cm (± 10%)• 50% MTF 12.0 lp/cm (± 10%)Technique• Tungsten wire in air• 160 mA, 120 kV, 1 s, 5 mm
	3. Low contrast detect ability should be 5mm at difference using 20cm CATPHAN (please mention phantom, scan time, mA, filter for image reconstruction, scan field, dose, slice thickness).	YES, Meets Specifications	**Phantom CATPHAN (20 cm)** Object size: 5 mm Contrast difference: 3 HU CTDIvol (32 cm) 10.75 mGy Technique 1.0 s, 10 mm, 120 kV
	4. High Contrast Resolution and Low Contrast Resolution for spiral must be same as that for axial.	YES, Meets Specifications	High Contrast Resolution and Low Contrast Resolution for spiral is same as that for axial.
17	**DOSE REDUCTION TECHNIQUE:**		

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	1. Should be available.	Yes	Combined Applications to Reduce Exposure (CARE protocols)
	2. Pre-patient collimation to reduce unnecessary dose to patient.	YES, Meets Specifications	Yes, based on CT application selected.
	3. Specify the Dose reduction software.	YES, Meets Specifications	Standard CARE technologies• CARE kV• 10 kV Steps• CARE Child• CARE Dose4D• CARE Topo• CARE Profile• CARE Filter• Flex Dose Profile• CARE Bolus CT• CARE Test Bolus• X-CARE• SAFIRE® (Sinogram Affirmed Iterative Reconstruction)
18	**POST PROCESSING TOOLS:**		
	1. 2-D, including image zoom and pan, image manipulations, including averaging, reversal of grey-scale values, and mirroring; image filter functions, including advanced smoothing algorithm and advanced bone correction.	YES, Meets Specifications	2-D, including image zoom and pan, image manipulations, including averaging, reversal of grey-scale values, and mirroring; image filter functions, including advanced smoothing algorithm and advanced bone correction.
	2. Real-time multi-planar reconstruction (MPR) of secondary views, with viewing perspectives in all planes including curved & orthogonal MPR.	YES, Meets Specifications	Real-time multi-planar reconstruction (MPR) of secondary views, with viewing perspectives in all planes including curved & orthogonal MPR is available on the system

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	3. **Standard 3D applications:** CT angiography, MIP, MinIP, SSD, VRT, and other advanced **3D applications** and colour coding for different tissues.	YES, Meets Specifications	CT angiography, MIP, MinIP, SSD, VRT, and other advanced 3D applications and colour coding for different tissues is available on the system.
	4. Post Processing Software: Perfusion CT, Image Fusion, Image reconstruction, filming, Curve MPR, CT Angiography, Auto bone removal, Vessel segmentation, Virtual Endoscopy software to be provided in all workstations.	YES, Meets Specifications	Perfusion CT, Image Fusion, Image reconstruction, filming, Curve MPR, CT Angiography, Auto bone removal, Vessel segmentation, Virtual Endoscopy software is provided in both workstations.
	5. Spatial alignment and visualization of two different data sets of one patient generated on different modalities or with different acquisition times.	YES, Meets Specifications	Spatial alignment and visualization of two different data sets of one patient generated on different modalities or with different acquisition times is available.
	6. Volume measurements	YES, Meets Specifications	Volume Measurements is available as a standard feature.
	PATIENT COMMUNICATION SYSTEM:		
19	An integrated intercom and Automated Patient Instruction System (API) should be provided	Yes, Meets Specifications	Automatic Patient Instruction (API) • Freely recordable • 7 API text pairs for respective languages available • Presets in 40 languages available
	CONNECTIVITY AND ARCHIVAL		
20	1. DICOM Connectivity (Specify Version) should be compatible and optimised for networking with other imaging systems.	YES, Meets Specifications	DICOM 3.0 connectivity for DICOM Send, Store, Query/Retrieve, MPPS, Print etc is in built and standard for networking with other imaging systems
	2. DICOM converters for linking the camera with other imaging systems of the department should be provided, if required separately.	YES, Meets Specifications	All modern systems are DICOM compatible. So such converters are not needed.

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3. It should have sufficient memory to store images from the CT as well as other systems connected to it.	YES, Meets Specifications	It has sufficient memory to store images from the CT, and can also retrieve images from other modalities.
4. Filming parallel to other activities, including independent scanning, documentation and post-processing and configurable image text.	YES, Meets Specifications	While scanning is in process, user can post-process other patient images, carry out filming, etc as required
5. Archiving: Multi - burner DVD/CD writer should be provided for archival. Specify minimum number of uncompressed and compressed images that it can store per disc.	YES, Meets Specifications	CD/DVD write is provided for image archival. About 4,000 images compressed per disk about 1,500 uncompressed images per disk.
6. Option of viewing these discs on any PC without DICOM viewer should be available.	YES, Meets Specifications	Yes, These images can be burnt on jpeg format and viewed on any PC without a DICOM Viewer.
7. Should be capable of IT system integration with PACS storage capacity of at least 30T	YES, Meets Specifications	The CT System is capable of integration with any PACS system as far as they follow a DICOM image transfer protocol.
UPGRADABILITY:		
4. Software updates that enhance existing applications must be provided by the vendor indefinitely at **no cost to the purchaser**. These no charge updates shall include any circuit boards or parts if software is added to enhance existing capabilities.	YES, Meets Specifications	Manufacturer releases mandatory updates from time to time. These updates are automatically performed if the system is connected to the Internet via SRS (Smart Remote Services). If the updates involve change in Hardware, these will also be performed.
5. System should have capability to being upgraded as new technology emerges for at least 10 years	YES, Meets Specifications	The Somatom GO Platform is a very new CT platform developed by Siemens. The system will have the capability of being upgraded as new technology emerges for 10 years or more.

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	Additional or new software must have the capability of being downloaded by remote computer access. Software must include a free trial period before purchase.	YES, Meets Specifications	If the System is connected to the Internet, additional or New Software can be downloaded. If not, Pacific can enable the installation of such new Software. Trial licences are available for trying out the software for a period of 3 months, before purchase.
21	**POWER SUPPLY:**		
	1. Power input to be 3 Phase, 380-480VAC, 50/60Hz, as appropriate fitted with for required items.	YES, Meets Specifications	400V, 3 Phase, 50HZ
	2. Suitable servo controller stabilizer provided with resettable over current breaker shall be fitted for protection.	YES, as per Clarification reply received.	We shall supply a Servo Stabiliser. However in our opinion, a Servo Stabiliser is too slow to respond to the high load demand of the CT scanner and will force the load to shift to the UPS, thereby rendering the Stabiliser ineffetive. The supplied UPS is able to carry out load supply stabilisation due to the Online design.Please confirm if you insist that the same be supplied.
	3. Online UPS of suitable rating for 30 minutes or more backup shall be supplied for the complete system including computers.	YES, Meets Specifications	120kVA or larger will be supplied with 30 min backup and will cover the whole CT System including the CT Computers.
22	**ACCESSORIES, SPARES AND CONSUMABLES:**		
	1. Standard Patient positioning accessories and restraining devices : 2 sets	YES, Meets Specifications	2 sets of Patient positioning accessories and restraining devices will be supplied.

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2. Good quality light weight vinyl Lead Eye Goggles, Thyroid Shields, Aprons and of .5mm lead equivalent : 3 units each	YES, Meets Specifications	Led Glass Goggles, Thyroid Shields, Lead Aprons all of 0.5mm Pb, 3 nos each will be supplied. Manufacturer Radi Teknoloji A.S., Turkey.www.radixray.com
3. Lead Glass 150x100cmx 2mm lead : 1 unit	YES, Meets Specifications	Lead Glass 150 x 100 x 2.2mm Pb, with frame will be supplied
4. Patient transport trolley : 2 units	YES, Meets Specifications	2 units Patient transport trolleys shall be supplied. Manufactured by Jaffery Ind Saini Limited, Dar es Salaam
5. Instrument trolley: 2 units	YES, Meets Specifications	2 units Instrument trolleys shall be supplied. Manufactured by Jaffery Ind Saini Limited, Dar es Salaam
Non Invasive Monitor of 12" screen with TFT colour display with the following accessories:	YES, Meets Specifications	**BPL Medical India**, Non-Invasive monitor 12" Screen with accessories as stated below.
• Should be USFDA & CE (Notified body)	YES, Meets Specifications	CE Certified System. As well as USFDA.
• ECG /Resp: 5 lead ECG cable with clip – 2 sets per monitor and 10 lead ECG cable with clip 1 set per monitor.	YES, Meets Specifications	ECG /Resp: 5 lead ECG cable with clip – 2 sets per monitor and 10 lead ECG cable with clip 1 set per monitor.
• NIBP: Adult cuff -2 units per monitor and two sizes of Pediatric Cuffs –one per monitor. (Complete sets)	YES, Meets Specifications	NIBP: Adult cuff -2 units per monitor and two sizes of Pediatric Cuffs –one per monitor. (Complete sets) will be supplied.
• SpO2: Adult SpO2 sensor with cable – two units per monitor and Pediatric SpO2 Sensors – one unit per monitor.	YES, Meets Specifications	SpO2: Adult SpO2 sensor with cable – two units per monitor and Pediatric SpO2 Sensors – one unit per monitor. Will be supplied

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	• Temperature: Central temperature Probe – two per monitor and Skin temperature probe – one unit per monitor	YES, Meets Specifications	Temperature: Central temperature Probe – two per monitor and Skin temperature probe – one unit per monitorwill be supplied
	6. Defibrillator Monitor/ Inbuilt Recorder Biphasic with auto and manual mode up to 360 Joule :	YES, Meets Specifications	**BPL Medical India** Defibrillator Monitor/ Inbuilt Recorder Biphasic with auto and manual mode up to 360 Joule
	• Should be USFDA & CE (Notified body). It should be mains and battery operated.	YES, Meets Specifications	USFDA & CE certified. It is mains and battery operated.
	• Should deliver at least 25 shocks with fully charged battery with the following accessories:	YES, Meets Specifications	Delivers at least 25 shocks with fully charged battery with the following accessories
	• Adult and paediatric paddle : 1 each	YES, Meets Specifications	Adult and paediatric paddle : 1 each
	• Disposable pads: 10 units.	YES, Meets Specifications	Disposable pads: 10 units.
	7. Dual head Pressure Injector with the following:	YES	**Medtron** CT-D, Dual Head CT Injector
	• Should be CE (Notified body) approved.	YES, Meets Specifications	CE Certified System. As well as USFDA.
	• Flow rate 0.1-10 ml/sec, Volume - 1 ml to syringe capacity, programmable pressure limit of 325 psi with 200 ml disposable sterile syringes. Syringe heater range 35 deg C+/- 5 deg C.	YES, Meets Specifications	Flow rate 0.1-10 ml/sec Volume - 1 ml to 200ml, programmable pressure limit of 21 bar with 200 ml disposable sterile syringes. Syringe heater range 35 deg C+/- 5 deg C.
	• Should be provided with head mounting device and integral IV pole.	YES, Meets Specifications	Provided with Syringe Head Mounting Device. This is a CT Injector with dual syringes, so no separate IV pole on the Injector is required.

	• 1000 unit's syringes with tubing's to be provide with the machine.	YES, Meets Specifications	1000 syringes with tubings shall be supplied (200 per year as per respons eto clarification)
	• Unit will be provided with display monitor to provide Pressure Monitor graph, Flow Profile, Stop Watch Feature, Scan Display, multiphase capability and protocol locking capabilities.	YES, Meets Specifications	Unit is provided with display monitor to provide Pressure Monitor graph, Flow Profile, Stop Watch Feature, Scan Display, multiphase capability and protocol locking capabilities.
	8. Other items to be supplied:		
	• Post processing room chairs : 5 units	Yes	Manufactured by Jaffery Ind. Saini Limited, Dar es Salaam
	• Executive Chairs for reporting: 2 units	Yes	Manufactured by Jaffery Ind. Saini Limited, Dar es Salaam
	• Executive Tables for reporting : 2 units	Yes	Manufactured by Jaffery Ind. Saini Limited, Dar es Salaam
	• Patient waiting chairs : 8 units in 2 rows (4 Chairs in one row)	Yes	Manufactured by Jaffery Ind. Saini Limited, Dar es Salaam
	• One laptop and one laser printer with scanning & copy facility should be provided with latest specification for reporting & tele-radiology.	YES	HP Laptop and HP Laser printer with Scanning and Copy facility with latest specification will be supplied. Tele-radiology software is not included.
	NB. The make & model of all the additional equipment should be specified in the compliance statement for the technical evaluation, assessment & record.		
23	**SITE:**		

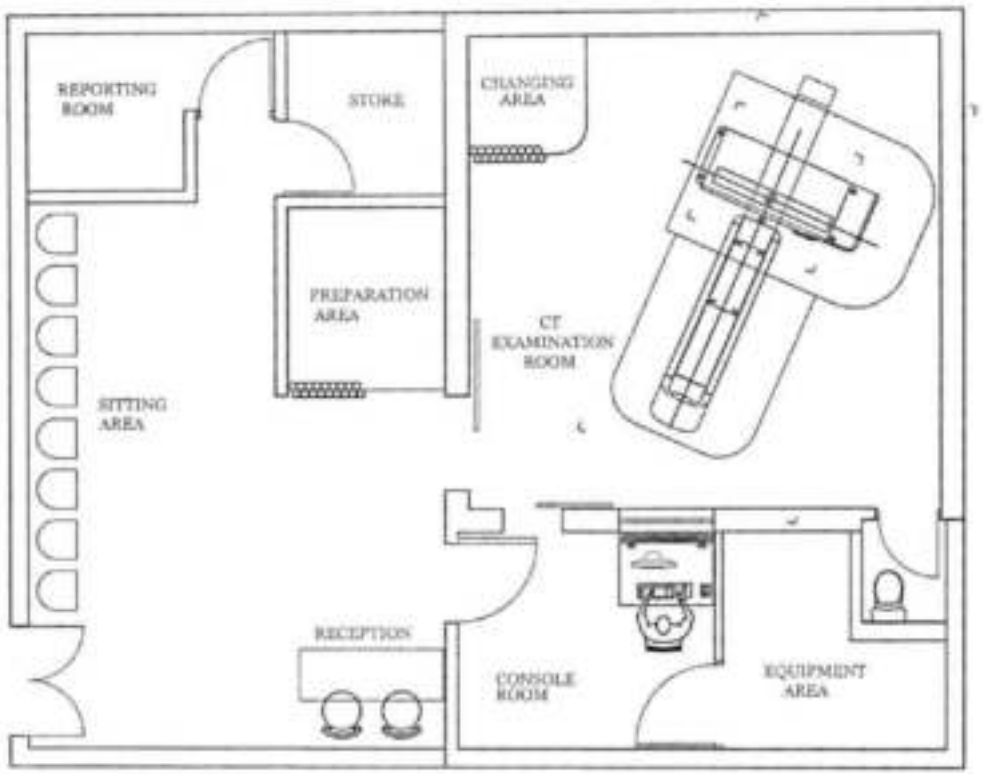
PACIFIC DIAGNOSTICS LIMITED DAR-ES-SALAAM

	1. A complete site preparation plan will be required to be submitted along with its financial components in separate cover. The vendor will be eligible to inspect the proposed site after obtaining permission. Care must be taken to address placement of the equipment, sitting, viewing and reporting area, patient preparation space, storage area etc.	Yes	Details are [provided.
	2. Requirements of power and air conditioning must be clearly specified in a separate section of the offer. The temperature of the gantry room to be maintained at 20oC.	YES	YES, Provided in Planning guide.
	WARRANTY & CMC:		
24	**Should have 2years warranty, and three years comprehensive and collective maintenance inclusive spare parts for entire CT system (X-ray TUBE and all accessories) including all turn key items (Patient Monitor, Defibrillator, Laser Imaging Camera, Digital film printer, Pressure Injector, UPS, Air Conditioner).**	YES	Included.
	Cost of CMC (Comprehensive Maintenance Contract) must be quoted in the price bid for the next 5 years after the expiration of the warranty period (i.e.: 6th, 7th, 8th, 9th, 10th).	YES	Provided in Price BID. Not added to tender price.
	Lifetime support; spare parts, consumables should be available throughout the lifetime period of the machine.	YES, Meets Specifications	Spares and Services are available throughout the lifetime of the machine.
	Uptake time should be a minimum of 90%.	Yes	We shall provide an Uptime of 90% or higher.

	Proof of locally available technical support personnel, including CVs and work permit for foreign personnel.	YES	All our engineers are Tanzanian citizens. No work permits are needed. We have submitted their Training Certificates.
	Availability of technical personnel within the country should be stated; this should include CVs, work permits for foreign personnel.	YES,	We have Technical personnel within the country
	Software should be flexible and provide the room for upgrade to add new parameters to be measured by the Machine and report format	YES, Meets Specifications	Software is flexible and provides the room for upgrade to add new parameters to be measured by the Machine and report format
	MANDATORY REQUIREMENTS:		
25	**Vendor shall have to process the documents and get all the necessary clearances of the unit from all regulatory authorities such as TAEC, TMDA and TBS.**	YES	We will process all the documents as requested, TMDA, TBS (as necessary) and TAEC.
	TRAINING & DOCUMENTATION:		
	At least 3 weeks on site training by application specialist for two radiologists, two radiographers.	YES	Will be provided.
26	· At least 3 weeks certified Comprehensive service training for Biomedical Engineer *at Manufacturer's site.*	YES	3 Weeks Site training, which will include one-week manufacturer site Installation training and 2 weeks apprentice training over the next 6 months with our local Engineering team.
	· Safety aspects of Radiation dosage leakage should be spelt out.	YES	Application Trainer will spell the Safety aspects of Radiation dose leakage.
	· User manual in English incorporating the newer applications.	YES	English Language manuals are suplied
	· Service manual in English	YES	Installation and basic service manual in English are supplied.

· Log book with instruction for daily, weekly, monthly and quarterly maintenance checklist.	YES	A LOG Book shall be provided for the Users to log in daily, weekly, monthly and quarterly maintenance as required.
· The job description of the hospital technician and company service engineer should be clearly spelt out.	YES	The Hospital Biomedical technician is responsible to attend to first line of maintenance of the Scanner and its components and inform the Company/Supplier with Information of the fault, maintenance, Error Logs and also schedule the Corrective and Preventive Maintenance of the scanner with the Company/Supplier. The Company service engineer will carry out all Corrective and Preventive maintenance with the hospital Biomed, order spares as necessary, and maintain the requested uptime of 90%. The Company will also provide service reports for service and spares tracking.
· Adequate books and journals within the warranty period	YES	Company will help to connect Users to the Siemens CT Users group where online Documents and journals published by Siemens are available.

PACIFIC DIAGNOSTICS LIMITED
DAR-ES-SALAAM



Total Area: 115 Sqmtr

				CLIENT : MUHIMBILI NATIONAL HOSPITAL	TITLE: RADIOLOGY EQUIPMENT (CT SCAN BLOCK PLANNING)
				PROJECT : CT SCAN INSTALLATION	APPROVAL ✓ / INFORMATION / CONSTRUCTION
REV.	DESCRIPTION	DATE	CHK.	LOCATION : TEMEKE DSM	DATE / SCALE / FILE / PREPD BY / CHECKED BY / APPD BY

Pacific Diagnostics — your healthcare partner
Dar Es Salaam, Tanzania

DRG.NO. TENDER NO.: PA/008/2021-22/HQ/C/08 LOT15

REV. R0

Stand out in advanced CT procedures

SOMATOM go.Top

International version. Not for distribution or use in the U.S.

siemens.com/somatom-go-top

SIEMENS Healthineers

A fundamentally changing environment

The healthcare market is transforming. Apart from the ongoing consolidation of hospitals and diagnostic imaging centers, perhaps the two most prominent areas of change are reimbursement structures and demographics.

Healthcare providers are facing, for example, the shift toward outcome-oriented compensation models and an aging population with growing care needs for chronic diseases. In clinical practice, this often means having to manage an increasing number of patients at lower costs. At the same time, consolidation comes along with the need for smooth fleet management and standardized results across networks.

It is therefore vital for healthcare providers to set themselves apart in a competitive market. They must find ways to increase efficiency and secure referrals by offering outstanding, patient-centric service.

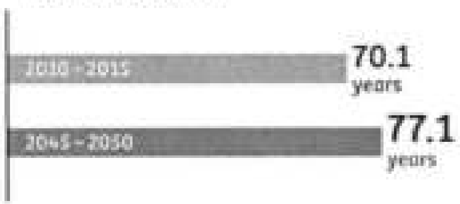
"Your daily success is important to us. In order to help you master advanced clinical fields, we developed SOMATOM go.Top in close collaboration with you, our customers. For me, SOMATOM go.Top is therefore a direct expression of our aim to be an inspiring partner."

André Hartung
Head of Business Line Computed Tomography
at Siemens Healthineers

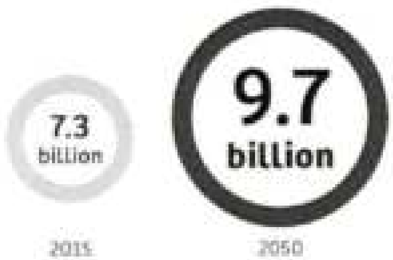
Staying on top in a challenging market

Changes in demographics and the healthcare market create a challenging situation for healthcare providers. While facing reimbursement cuts, they have to provide services for more – and older – patients. The market, however, also offers opportunities: The ongoing trend to have reimbursements correspond to outcome quality allows providers to profit from their efforts to set themselves apart from competition, be it through excellent clinical outcomes or patient satisfaction.

Increase in life expectancy & world population



Average life expectancy worldwide has been increasing and is expected to continue to do so.[1]



World population in 2015 and estimated population by 2050[3]

Reimbursement cuts and consolidation

For Medicare and Medicaid patients, U.S. hospitals only received an average of 89 cents for every dollar spent in 2015.[2]

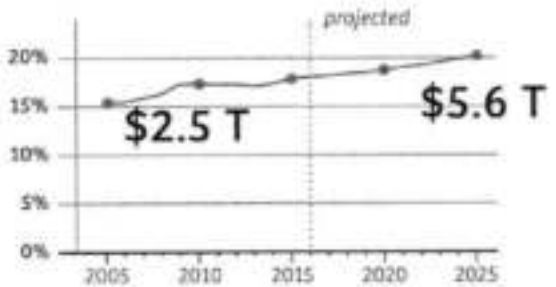
Demographic change

As the world's population is on the rise – and expected to reach 9.7 billion by 2050 – global life expectancy is also increasing. Providing for the care of a growing and aging population will put a severe strain on medical resources.

Economic pressure

The growing population puts enormous pressure on healthcare systems around the globe. As a result, many have responded with significant cuts in reimbursement. Another phenomenon we are witnessing is the ongoing consolidation of healthcare providers – this mandates the standardization of processes to increase efficiency.

Expenditures on healthcare in the U.S.



Medicare actuaries project growth rates for healthcare spending to gradually increase.[3]

Growing expenditure

Total expenditure on healthcare in the U.S. is projected to grow from $2.5 trillion in 2009 to $5.6 trillion in 2025. As Medicare is a model for many healthcare systems worldwide, it is safe to predict similar trends in many other countries.

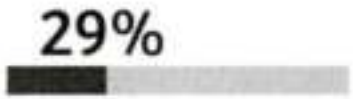
Out-of-pocket health expenditure

Fraction of out-of-pocket expenditure in terms of total health expenditure[4]

Better informed patients

In addition, out-of-pocket expenditure on healthcare continues to be an issue for patients worldwide. Consequently, patients are more informed and more selective. Healthcare providers that positively set themselves apart stand a much better chance of attracting such patients.

Clinical best practice to secure reimbursements



29 percent of CT departments plan to purchase a scanner with dual energy capabilities[5]

The role of CT

An expected trend, especially for CT imaging, is that financial incentives will increasingly correlate to clinical best practices.[6] For healthcare providers, this is an opportunity to benchmark new clinical pathways with innovative technologies such as dual energy. The increasing demand for enhanced diagnostic information offered by dual energy is vividly reflected in the inclusion of its availability as a key decision criteria for future CT purchases by many providers.[5]


Healthineers
SOMATOM
go.Top

Make success your daily business

In a market characterized by intense competition, more selective patients, and reimbursement cuts, healthcare providers must find ways to leverage technological advancements and secure income and referrals. To keep the business running, it is crucial for CT departments to differentiate themselves and deliver excellent patient-centered care.

We want to help you succeed day after day. This is why we developed the SOMATOM® go. platform. As a member of this family, SOMATOM go.Top supports all users to provide the best possible scan for every type of patient – no matter the clinical demands and challenges. The scanner features a unique tablet-based mobile workflow, user guidance with our GO technologies, and exclusive innovations such as Tin Filter low-dose technology.

SOMATOM go.Top is built for personalization of processes and care, allowing every operator to optimally adapt to the individual patient and indication while interacting with patients in a more personalized way than ever before. Produce excellent results for the full clinical spectrum including Dual Energy imaging, and offer what others cannot – for a successful CT business.

SOMATOM go.Top
Stand out in advanced CT procedures

Contents


SIEMENS

SOMATOM go.Top at a glance

How it all started – with you, our customers

Based on many conversations with healthcare professionals, we realized that we needed to pursue new ideas and approaches to computed tomography.

We therefore conducted extensive interviews with 500 customers from eleven countries to learn about your everyday needs and challenges. In co-creation sessions, we asked you what your ideal CT scanner would look like.

Having gathered a wealth of insights, we commissioned a group of 50 Siemens Healthineers engineers to build the best possible CT scanner for routine and chosen advanced tasks. The result is not simply a scanner but a completely new CT platform specifically designed to overcome the obstacles associated with acquiring, operating, and maintaining a CT system. SOMATOM go.Top is part of this platform.

Go for high performance with trendsetting workflows

For efficiency independent of the operator's level of experience and a more personal interaction with the patient, SOMATOM go.Top is built on a unique concept of mobile operation and workflow automation – for the first time available both in routine and advanced fields.

Go for the full clinical spectrum with patient-centric technology

SOMATOM go.Top enables you to confidently offer specialized CT procedures, including Dual Energy. With patient-centric technologies and workflows to optimally adapt to each type of patient, all operators can turn challenging fields into routine – and serve the full clinical spectrum.

Go for business growth with an all-in-one solution

SOMATOM go.Top features an all-in-one solution resulting in reduced total cost of ownership – while also opening additional reimbursement opportunities for business growth.

Patients and referrers have a choice

When it comes to health services, patients are better-informed compared to the past and referrers have a choice. In such an environment, your ability as a healthcare provider to meet their expectations is crucial. At the same time, intensified cost pressure makes efficiency in your workflow equally important. Efficient throughput management and the ability to fully focus on patients are often hindered by complicated scanner operation and cumbersome workflows, particularly in advanced clinical fields.

"Improving patient satisfaction" rated top priority

A 2016 market report asked respondents to name a priority for their CT department's mission over the coming year. The top priority was to "improve patient satisfaction with their CT experience" (average rating of 4.7 out of 5).[7]

How important is this to you?

Go for high performance with trendsetting workflows

For efficiency independent of the operator's level of experience and a more personal interaction with the patient, SOMATOM go.Top is built on a unique concept of mobile operation and workflow automation – for the first time available both in routine and advanced fields.

Work more efficiently and patient-friendly with the new mobile workflow

A central element of optimizing efficiency and improving patient comfort is an entirely new approach to operating the scanner. Built around a new mobile workflow, SOMATOM go.Top features a line-up of innovative solutions. Tablet, remote control, camera, injector arm, and a new workplace design bring an unparalleled level of flexibility and mobility to daily CT procedures.

Tablet

The lightweight, high-resolution tablet gives you total freedom over how you work. With Scan&GO technology, you just need a few steps for the entire scan. Start checking patient information as soon as you collect them from the waiting room, and then prepare the scan directly at the gantry to stay with the patient for longer. Since the images are sent wirelessly from the scanner to the tablet, operators can return to the patient after the scan and stay there while previewing the images and communicating with radiologists for instant feedback if required.

Remote control

The easy-to-use Bluetooth remote control complements the tablet operation by streamlining scanning and making workflow processes more efficient. It simplifies patient positioning by removing the need to use hard-to-reach controls on the gantry.

Adjust the table position so everything is ready to go once the patient arrives, and start the scan remotely. Then, end examinations smoothly by moving the table into the unload position as soon as the scan is over.

Camera

By helping you keep an eye on the patient at all times, the gantry-integrated camera makes it easy to provide better care. Its 90° viewing angle gives you a superb view of the tunnel on the stationary monitor.

The close-up perspective makes it easy to spot even micro-movements and keep the patient in the right position. In addition to the camera, the Halo assembly includes ambient mood lighting and a digital visual countdown to help improve patient well-being and help them comply with breath-hold times.

Injector arm

The unique gantry-mounted injector arm of SOMATOM go.Top lets you position the injector where you need it, when you need it. While a traditional injector cart is often in the way, the injector arm makes for a neat and organized working environment and still lets you flexibly arrange the injector.

Standard workflow

Mobile workflow

Preliminary results from a study with the SOMATOM go. platform. Courtesy of Erlangen University Hospital, Erlangen, Germany

New workplace design

Thanks to gantry-integrated computers, SOMATOM go.Top gives you complete flexibility over where you position the workstation. Depending on your needs and infrastructure, you can set it up in the same room, outside the scan room, or in a separate control room. By using the unique niche concept, for example, you can position the console in the same room as the scanner while keeping staff perfectly safe from radiation. Thus, operators can stay with their patients longer and solve any positioning problems quickly.

The image on top visualizes a standard workflow with the operator spending most of the time in the control room. The unique new workflows of SOMATOM go.Top, shown below, are based on tablet-operation and automation. They allow users to spend most of the time with the patient – which results in higher efficiency, higher patient comfort, and less motion artifacts.

Automate your workflow with GO technologies

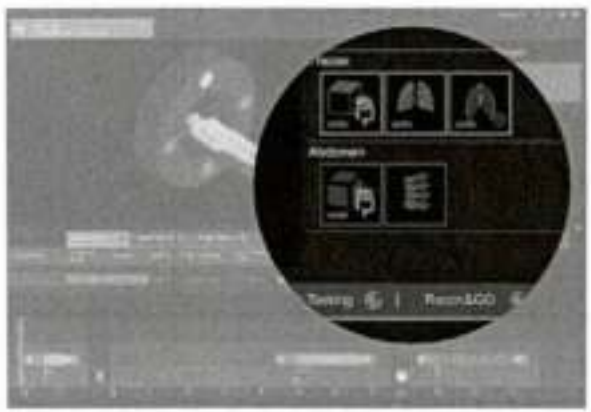
Another important factor contributing to high performance, independent of the operator's level of experience, is workflow automation. SOMATOM go.Top features a holistic set of intuitive solutions that addresses your workflow not only at the scanner but also beyond. These features are now available for the first time in both routine scanning and advanced clinical fields. By reducing repetitive workflow steps, GO technologies help standardize and simplify all departmental processes – from patient setup to image distribution, archiving, and reading. You can therefore work more efficiently and focus on your patients – two key factors for running a successful business.

Scan&GO

This advanced tablet app allows you to control scans remotely. You can choose whether to operate the scanner at the gantry or from outside the room to benefit from faster patient preparation and positioning. You can also check the images quickly after the scan, as wireless connectivity sends the results to the tablet almost immediately. Scan&GO brings an entirely new level of flexibility to your processes. Patients are also likely to feel more comfortable, since you can be with them for longer.

Check&GO

This intelligent algorithm flags up problems with coverage or contrast distribution as they occur. Correct issues on the go, prevent subsequent errors in multiphase scans, and avoid archiving suboptimal images. The FAST ROI feature automatically identifies regions of interest and monitors HU for the aorta and pulmonary trunk in bolus tracking examinations. Check&GO's automated support means that users of all levels of experience can produce high-quality images.

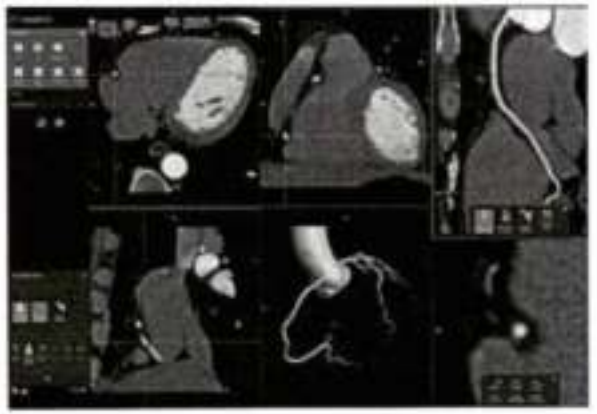


Recon&GO

Recon&GO performs zero-click postprocessing, making it part of the standard reconstruction tasks. This ready-to-read technology saves time and cuts down on workflow steps. Recon&GO delivers high-quality results irrespective of the operator or clinical area, and allows users to spend more time with the patient. Achieve fast, standardized, and reproducible results with this automated postprocessing and reconstruction solution.

*"The mobile workflow:
More than ever, the patient is in the center of the whole examination."*

Carla Susana Ribeiro Pinto
CT radiographer at Centro Hospitalar de São João, Porto, Portugal



CT View&GO

As an all-in-one, cross-specialty viewing solution, CT View&GO provides a large variety of clinical applications and tools directly at the scanner – for smooth reading in just one workflow. Thanks to a customizable user interface, you can tailor the system to your needs. The automatic distribution and filming of images and results enhances departmental communication and integration. At the same time, advanced CAD algorithms and applications boost sensitivity and specificity in diagnoses. For additional flexibility, CT View&GO is available as an independent console with the same tools known from the scanner.

FAST, CARE, and GO

Proven for years, fully assisting scanner technologies (FAST) bring speed and efficiency to daily CT routines. They make complex procedures more intuitive and enhance consistency through standardized workflows. Combined applications to reduce exposure (CARE) optimize dose level and image quality, and offer patient-friendly scans with parameters adapted to the individual anatomy. FAST, CARE, and GO help you deliver better results, make your scanning safer, and devote more time to taking care of your patients.

Adapting to the market is key

In the changing and demanding healthcare market, it is necessary to serve a broader range of clinical fields. Patient variability poses challenges in this context. With this in mind, staying ahead in a competitive environment not only requires outstanding quality in your imaging results but also the ability to adapt to the market's – and the patients' – varying needs.

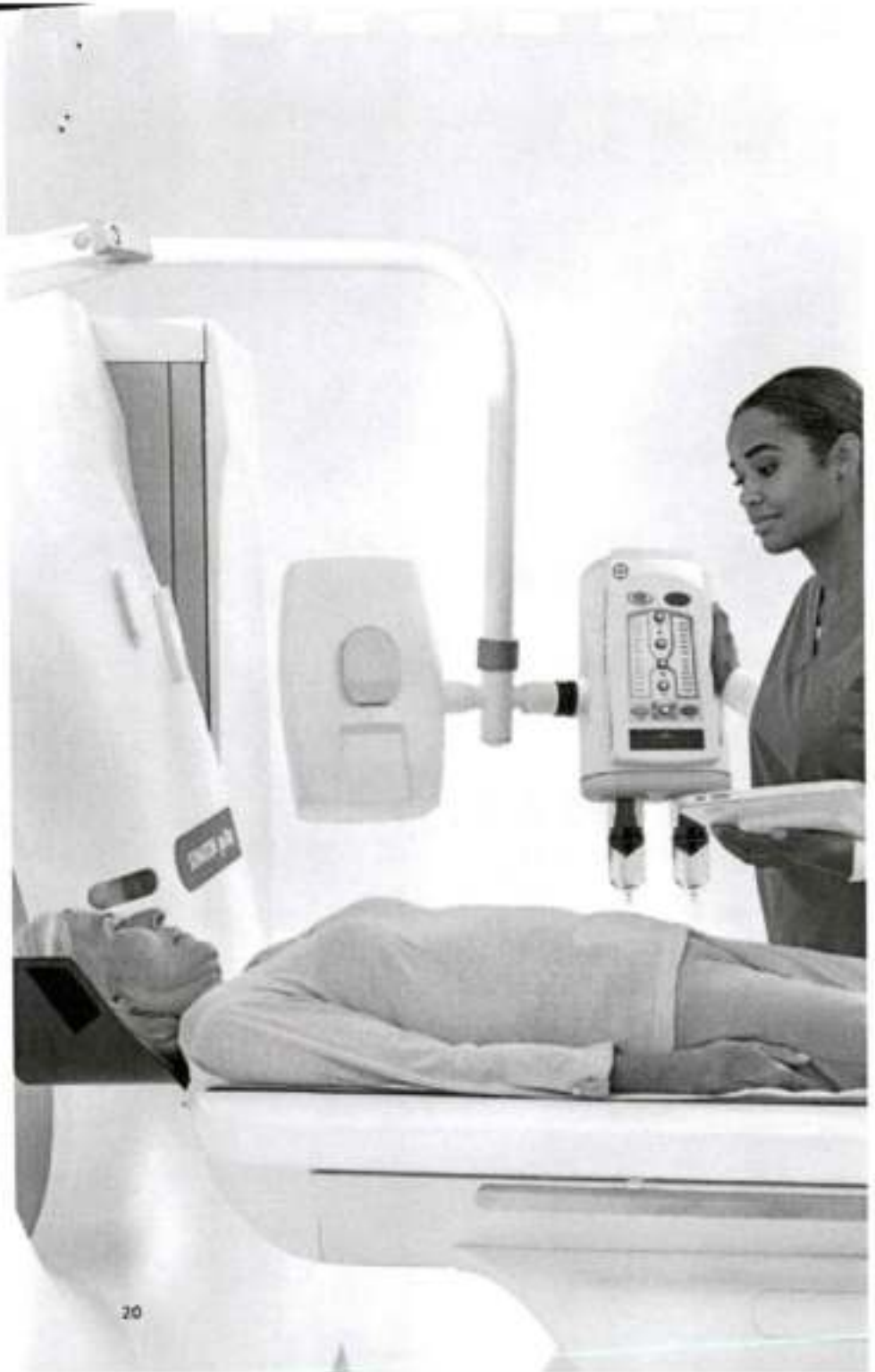
Time-to-diagnosis of acute chest pain

Cardiac CT is a complex workflow. In a 2013 multicenter study, the average time-to-diagnosis for the assessment of acute chest pain in the emergency room was 2.9 hours.[5]

Think about how many workflow steps need to happen within this short time frame.

Go for the full clinical spectrum with patient-centric technologies

SOMATOM go.Top enables you to confidently offer specialized CT procedures, including Dual Energy and cardiac CT for additional diagnostic information. With patient-centric technology and workflows to optimally adapt to each type of patient, all operators can turn challenging fields into routine – and serve the full clinical spectrum.



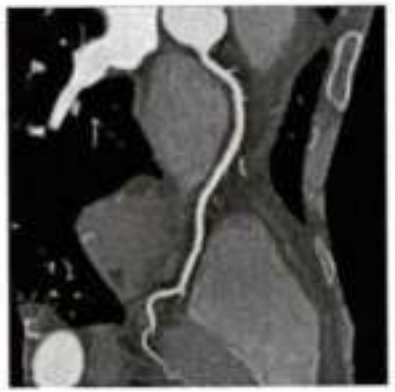
Stand out in these fields

Speed and standardization in acute care

Help your operators perform at 100 percent, regardless of experience. Our workflows and technology allow you to move fast and make confident, patient-focused decisions when every second counts.

Routine-ready Dual Energy

Increase your diagnostic confidence for all types of patients with TwinBeam Dual Energy. By acquiring low- and high-kV datasets in a single scan, it visualizes information that would otherwise go unseen – with no dose penalty.



Clinical consistency in cardiac CT

Stay ahead of the competition with optimized preparation, fast scanning, and standardized results in every cardiac case. Seamless integration of GO technologies allows you to devote more time to your patient.

Sensitive scanning in pediatrics

Put the wellbeing of your littlest patients – and their parents – first. Use the mobile workflow to stay close to the child as you prepare the scan, and minimize radiation exposure with dedicated pediatric solutions.

Intuitive functions in CT-guided intervention

Our tablet-based solution Guide&GO is the latest innovation in CT-guided intervention. Intuitive functions help you accurately navigate and target, while advanced dose features protect both you and your patients.

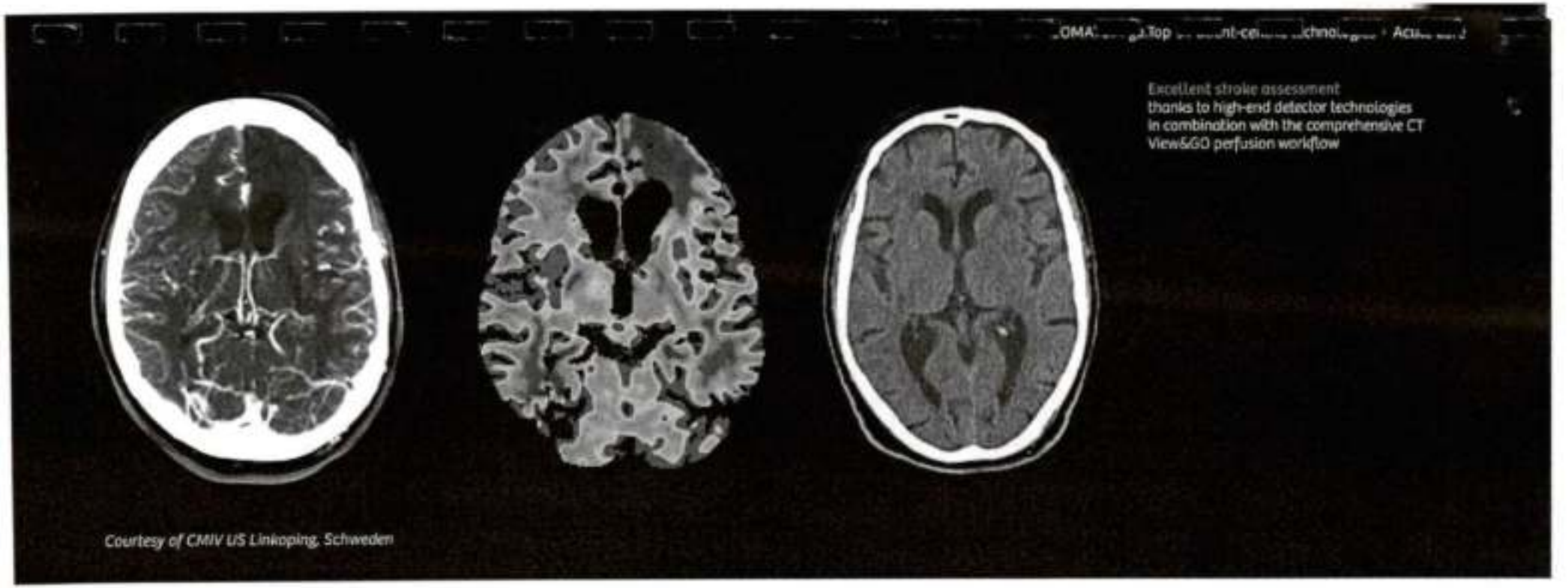
Patient-centric technologies in routine CT

Deliver consistent, reliable results in routine CT. Guided workflows and cutting-edge technologies allow you to optimally adapt to each patient in routine oncology, vascular, orthopedic, and neuro imaging.

Speed and standardization in acute care

Emergency situations put you and your staff under pressure. Every operator in your CT department has to perform at 100 percent, regardless of his experience. What is more, you should be able to handle every patient, from children to bariatric cases. To stand out in acute care, you need efficient workflows and patient-centric technologies that allow you to move fast and make confident decisions when every second counts.

SOMATOM go.Top accelerates the entire CT procedure, from patient preparation to image reading. Our trendsetting mobile workflow keeps you close to the patient while you prepare the examination using Scan&GO. The tablet also gives you the flexibility to prepare the scan wherever most appropriate – which is helpful when faced with the crowded environments typical in acute care settings. Since you can do everything on the tablet (including previewing the images and triggering reconstructions), you can navigate the tasks faster and devote more time and attention to your patient.



Excellent stroke assessment
thanks to high-end detector technologies in combination with the comprehensive CT View&GO perfusion workflow

Courtesy of CMIV US Linkoping, Schweden

Standardized stroke assessment

One in six people will suffer a stroke at some point in their life.[9] Time is of the essence here: Reducing door-to-needle times by 15 minutes can extend patient survival chances by an average of 5 percent.[10] We can help you successfully cover more of the clinical spectrum with advanced tools for speed and precision in challenging stroke cases.

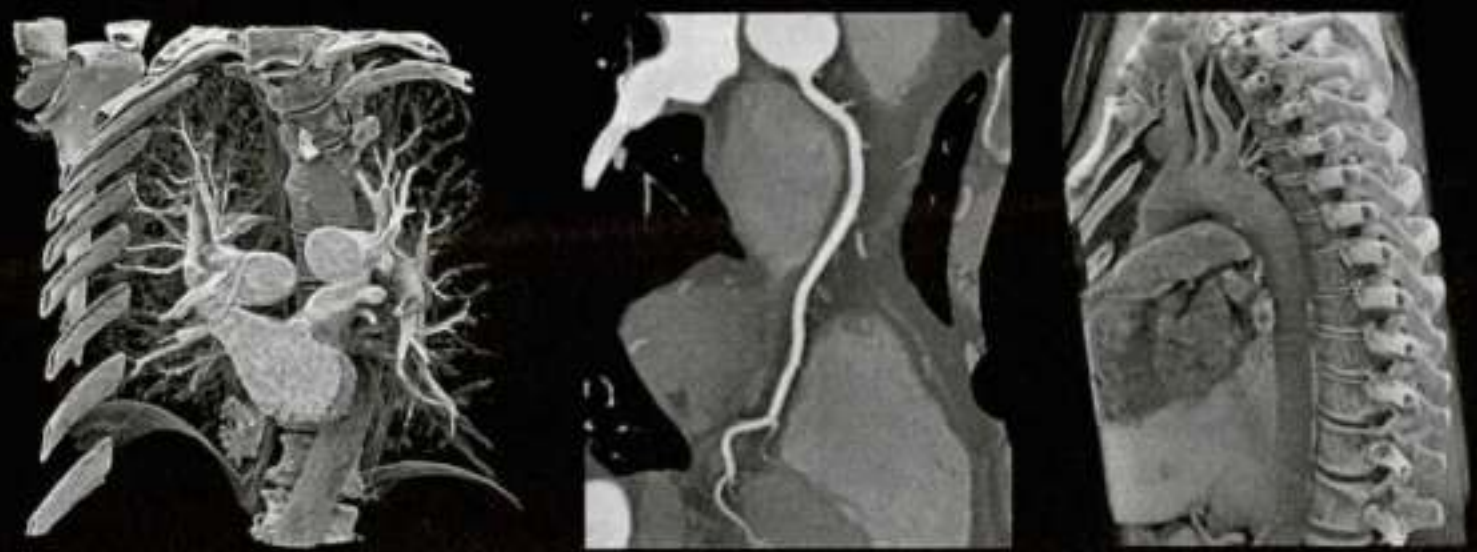
With its standardized workflow, SOMATOM go.Top provides fast, accurate information about the three key factors in stroke diagnosis: bleeding, infarct size, and clot location. The low electronic noise of the Stellar detector helps you rule out bleeding with excellent gray/white matter differentiation. When it comes to dynamic imaging, Neuro Perfusion offers both a guided and an automated workflow at the scanner console, and automatically calculates perfusion maps and tissue at risk. TwinBeam Dual Energy removes bone with a single contrast-enhanced scan for faster clot location and less dose. And just as they do in the other clinical areas, GO technologies standardize results and contrast distribution, and overcome the challenge of patients who may be unable to cooperate.

Stellar detector

The Stellar detector features fully integrated components for lower image noise in every scan, while advanced iterative reconstruction from SAFIRE[20] delivers superb image quality at very low doses. Combined, they produce excellent and homogenous images – even in complex areas such as the base of the skull, which is especially useful in stroke assessment.

The detector also improves image quality with a new geometry and increased number of 840 channels in the scan plane. The high channel density is a major benefit for neuro imaging. It achieves excellent gray/white matter differentiation that helps you identify subtle changes in Hounsfield units (HU).

Fast and standardized acute care imaging through guided and automated GO technologies



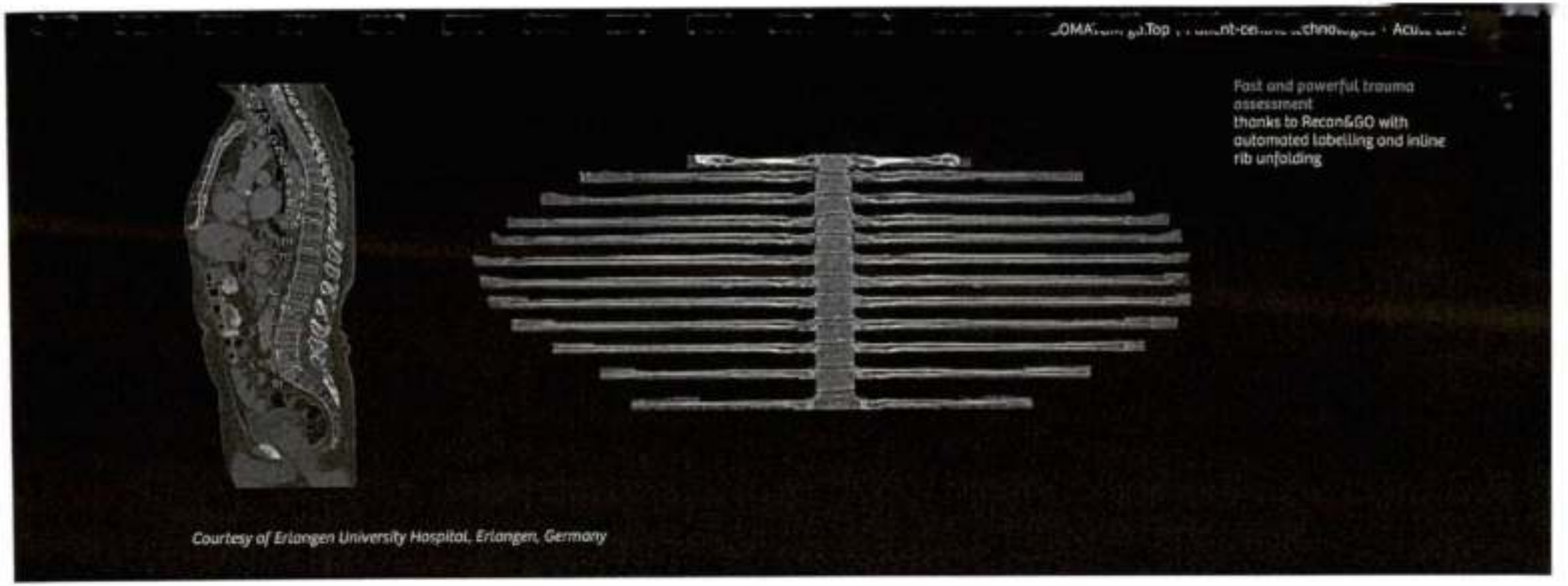
Courtesy of Erlangen University Hospital, Erlangen, Germany[1]

Rapid chest pain assessment

When a patient presents with acute chest pain, you might be dealing with coronary artery disease, an aneurysm, or a pulmonary embolism – to name just the three most common reasons for chest pain. SOMATOM go.Top gives you everything you need to reliably establish the cause in the smallest timeframe possible.

Guided, automated workflows from GO technologies play a crucial role here. Scan&GO simplifies patient preparation, electrode placement, and ECG monitoring. Check&GO helps you optimize coverage and achieve the right contrast distribution and timing.

For the diagnosis itself, Recon&GO generates radial and cross-sectional CPRs of the main arteries. These allow you to rapidly detect coronary artery disease, aneurysms, or dissections of the central vessels. TwinBeam Dual Energy Lung Analysis provides color-coded visualizations of the endoluminal thrombus and its associated lung perfusion impairment – so even inexperienced users can quickly and confidently detect or rule out acute pulmonary embolism.



Fast and powerful trauma assessment
thanks to Recon&GO with automated labelling and inline rib unfolding

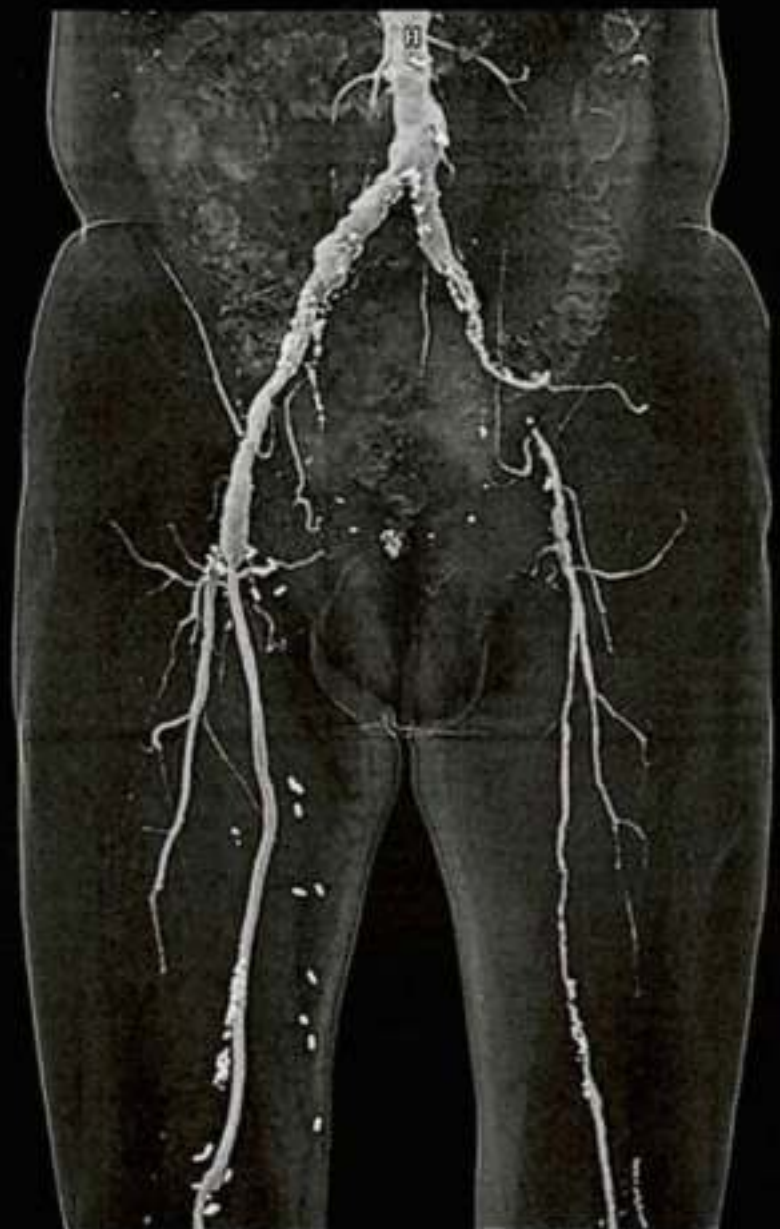
Courtesy of Erlangen University Hospital, Erlangen, Germany

Efficient trauma assessment

Trauma is the leading cause of death among people under the age of 44.[12] If you want to cover the full clinical spectrum in CT imaging, your department needs to be able to handle trauma cases. This calls for powerful technology, standardized results, and highly efficient workflows.

We designed SOMATOM go.Top with trauma in mind, so that you can produce reliable images when every second counts. Our Athlon® tube, for instance, has the power (it delivers the highest tube current available in this class of scanner) and advanced cooling necessary to perform whole-body scans with no delays or stoppages. These scans are proven to increase the probability of survival in polytrauma patients.[13] They allow you to detect multiple injuries at once, and to plan optimal, personalized treatment for each patient.

For consistent results, FAST Planning automatically sets scan and reconstruction ranges, while Check&GO alerts you to issues with coverage or contrast distribution during the scan. Recon&GO accelerates reading with automated rib unfolding, spine labeling, and anatomically corrected orientations. And since metal can often be an issue in trauma cases, our iMAR[14] algorithm is a key advantage for this clinical field. By reducing metal artifacts, it improves visualization of soft tissue around metal – and the effect can even be further enhanced by combining iMAR with TwinBeam Dual Energy acquisition.



Dual Energy acquisition provides advanced diagnostic image quality through highlighting, characterization and quantification of material.

TBDE CT angiography
- Cinematic VRT[1]
- Tube voltage: AuSn 120kV
- CTDIvol: 6.2mGy

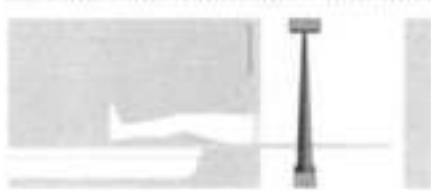
Courtesy of Erlangen University Hospital, Erlangen, Germany

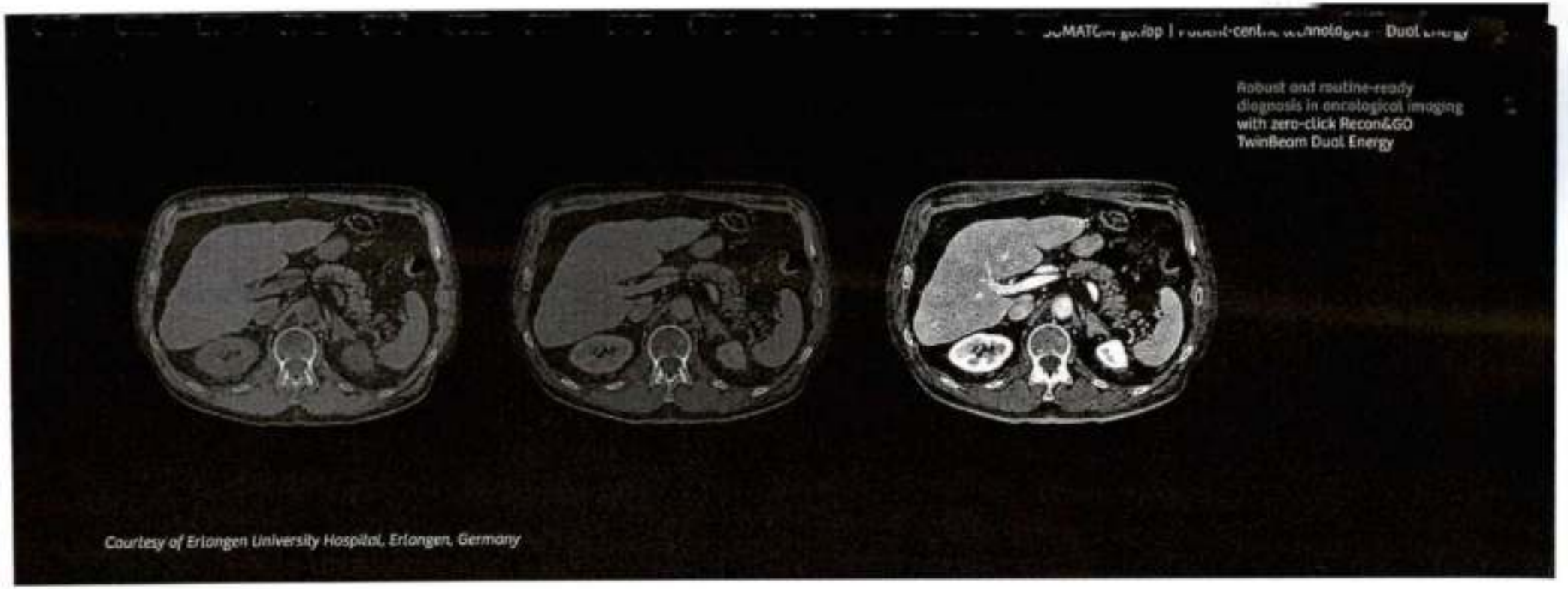
Routine-ready Dual Energy

The more your CT images show you, the better your patient outcomes will be – and with the reimbursement trend moving away from fee-for-service and toward quality of care,[15] outcomes are now more important than ever. If you can offer dual-energy scanning, your chances of being blindsided reduce significantly.

TwinBeam Dual Energy

SOMATOM go.Top allows you to see more. Its TwinBeam Dual Energy technology acquires low- and high-kV datasets in a single scan. This produces rich diagnostic information that a conventional single source scan cannot deliver. By allowing you to characterize, highlight, and quantify different materials, TwinBeam Dual Energy gives you greater diagnostic confidence with virtually all patients. It does this without dose penalty, and even allows you to further minimize radiation with any of our existing dose-reduction technologies.





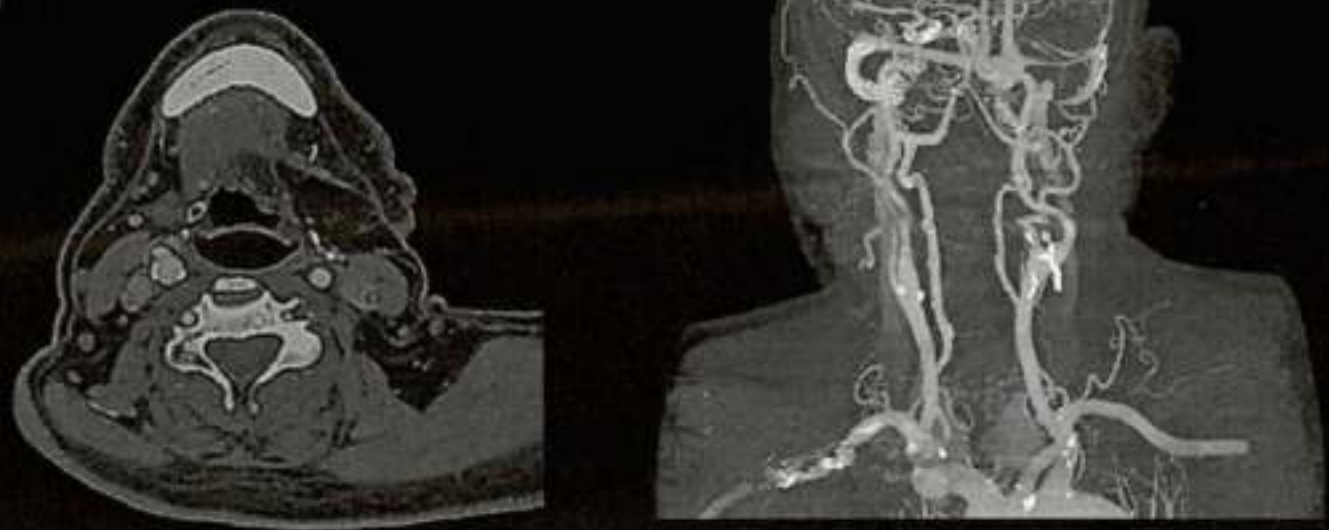
Robust oncology diagnosis

TwinBeam Dual Energy optimizes clinical pathways in oncology. Its advanced capabilities improve diagnostic confidence and quality, helping you detect tumors faster and more reliably than ever before.

Dual Energy workflows in CT are usually considered complicated and cumbersome. Recon&GO allows you to bring dual-energy imaging into clinical routine. The technology generates the required Dual Energy post-processing directly at the acquisition workplace and sends the results to the PACS. As part of an advanced, straightforward workflow, Recon&GO equips you with the enhanced diagnostic information that helps you see more and stand out from the crowd.

Virtual noncontrast images produced from a single contrast-enhanced scan help you locate and characterize lesions with less time and dose. Monoenergetic imaging delivers a better contrast-to-noise ratio that helps you see lesions more clearly and identify diffuse tumors with less contrast media. With Iodine Maps, you can quantify iodine uptake in tissues and lesions to assess malignancy and monitor treatment progress, which potentially reduces follow-up examinations.

Excellent visualization of vascular structures with TwinBeam Dual Energy technology and zero-click Recon&GO bone removal



Courtesy of Erlangen University Hospital, Erlangen, Germany

syngo.CT DE Hardplaque Display performed with syngo.via

Excellent bone removal in vascular imaging

TwinBeam Dual Energy Direct Angio overcomes the limitations of conventional bone removal. We can help you see more in CT angiography for greater confidence in assessing vascular disease.

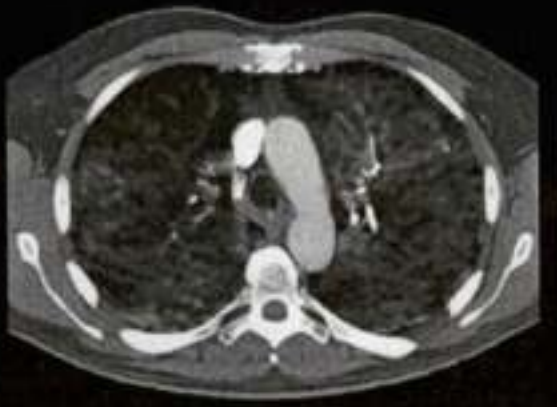
Direct Angio accurately highlights vessel structures on CTA datasets and suppresses bone structures for a bone-free view. It reliably isolates even complex vasculature, such as in the base of the skull. By successfully eliminating most bones from supra-aortic CTA datasets[16] and improving vessel delineation,[17] Direct Angio reduces your reading time for faster diagnoses and more efficient workflows.

Direct Angio also simplifies stenosis assessments by color-coding and removing calcifications from dual energy images. Since it can differentiate hard plaques from contrast agent, you get to see the true vessel lumen with no interference from hard plaques. In cerebrovascular cases, Direct Angio saves dose and time by eliminating bone and calcification with a single contrast-enhanced scan.

Advanced diagnostic information with TwinBeam Dual Energy technology

syngo.CT DE Calculi Characterization performed with syngo.via.

syngo.CT DE Gout performed with syngo.via.



syngo.CT DE Lung Analysis performed with syngo.via.

Kidney stones

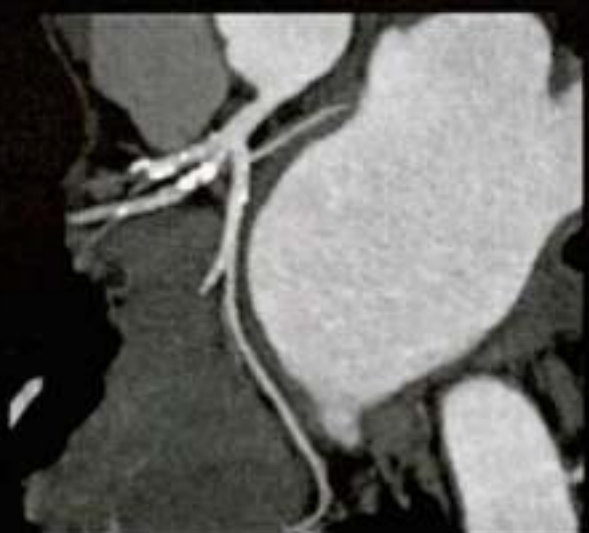
TwinBeam Dual Energy Calculi Characterization detects the composition and size of kidney stones, so you can make more confident diagnoses. Find out whether a stone is uric acid or calcium oxalate, and initiate the best treatment for each individual patient.

Gout

TwinBeam Dual Energy Gout allows you to visualize uric acid crystals in peripheral extremities – and in areas that conventional aspiration cannot reach, such as tendons and ligaments. It automatically color-codes the crystals, so you get a clear view of the deposits. The process is non-invasive, specific, and fast.

Pulmonary embolism

TwinBeam Dual Energy Lung Analysis helps you detect pulmonary embolisms with ease and confidence. With our advanced solution, you can assess perfusion defects and affected vessels quickly and easily. Color-coded visualizations give you the information you need at a glance, allowing even inexperienced users to rule out perfusion defects when no expert is on site.



Easy acquisition and consistently crisp visualization through an intuitive mobile and guided workflow with automated Recon&GO results

Coronary CTA
- MIP, curved MPR (CPR) and Cinematic VRT ®
- Tube voltage: 100 kV
- CTDIvol: 10.3 mGy

Courtesy of Erlangen University Hospital, Erlangen, Germany

	10.Warranty of tube: Comprehensive warranty for all parts including x- ray tubes for at least 2 years irrespective of number of scans.	YES, Meets Specifications	We have included a Comprehensive Tube and Spares warranty for 5 years, irrespective of the number of scans
6	**PATIENT TABLE:**		
	1. Minimum Load capacity of at least 200Kg ±10% with 1 mm positioning accuracy.	Yes, Exceeds Specifications	227 kg with positioning accuracy of 1mm
	2. Table speed: Horizontal up to 100mm or more/sec.	Yes, Exceeds Specifications	200mm/sec
	3. Vertical Table travel: 50mm/sec or more	YES, Meets Clinical Requirements	28.3 mm/sec
	4. Minimum table top height should be 55cm or less from the ground level for easy transportation of trauma patient.	Yes, Exceeds Specifications	46cm for easy transportation of Patient.
	5. Longitudinal Scan Range: at least 150cm or more	Yes, Exceeds Specifications	160 cm
	6. Manual movement of the table should be possible in case of power failure.	YES, Meets Specifications	Mechanical Lock can be released and Manual movement of table is possible for fast retrieval of patient in case of emergency or Power Failure.
	7. Reproducing positional accuracy should be mentioned.	YES	0.25mm reproducing positional accuracy
	8. Remote Up/down and forward /backward should be standard.	YES, Meets Specifications	Standard. From Console or from Tablet.
	9. Facility of positioning aid for horizontal isocentric positioning of the patient.	YES, Meets Specifications	Isocenter Horizontal Laser is available for accurate positioning of the Patient in the Isocenter.
	Should have Carbon Fibre Table Top.	YES, Meets Specifications	Carbon Fiber Table top is standard.
7	**SPIRAL CT:**		

PACIFIC DIAGNOSTICS LIMITED

Stand out in cardiac CT

Cardiovascular disease accounts for roughly a third of all deaths worldwide,[18] so the need for cardiac CT imaging is obviously high. However, the examinations are complex and particularly time-consuming for departments that handle multiple cardiac scans every day. Standardization can bring immense benefits by helping you produce consistent, high-quality results in every cardiac case.

Cardiac CT made easy

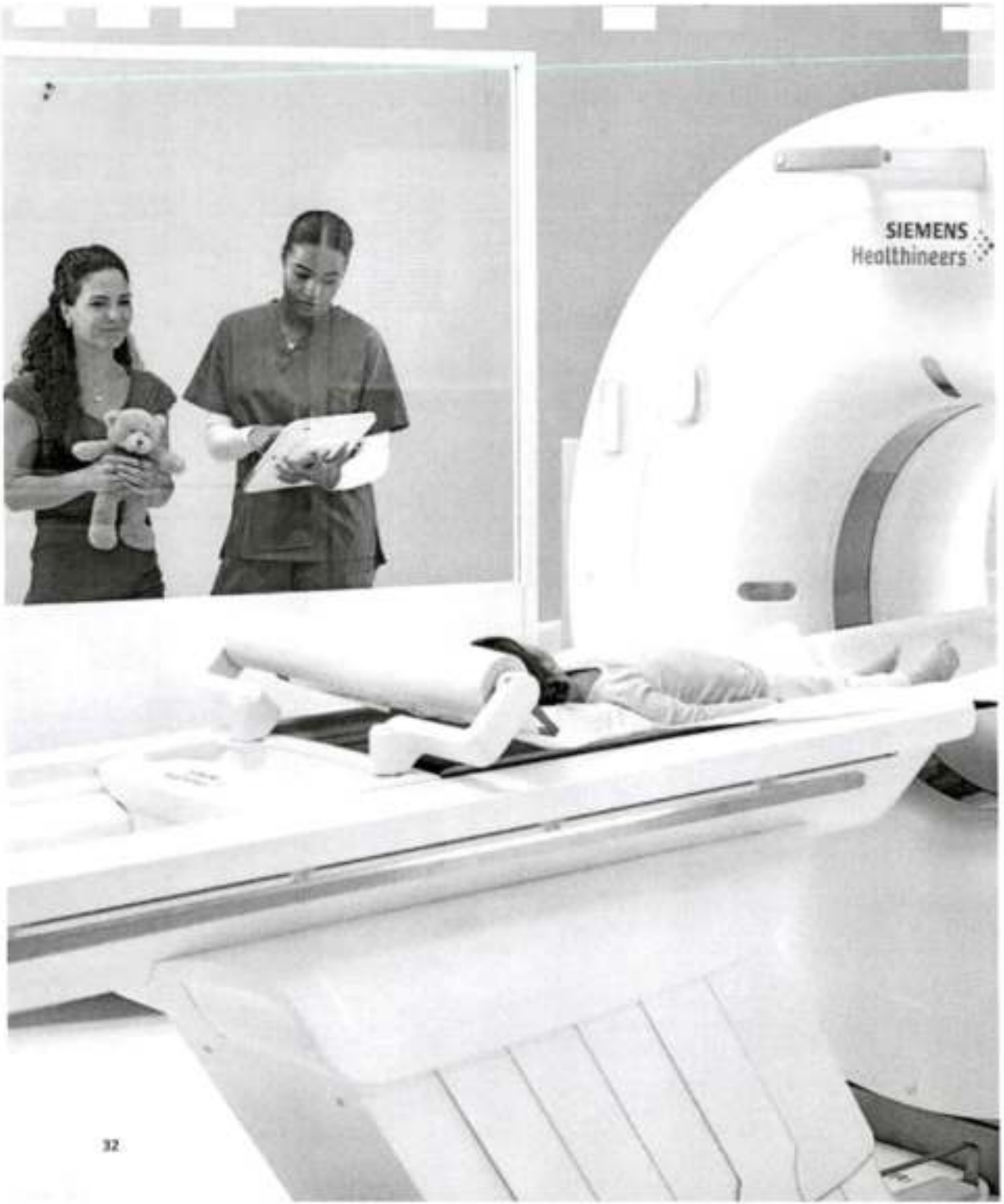
SOMATOM go.Top offers standardized workflows, fast scanning, and automated postprocessing. Seamlessly integrated GO technologies take care of multiple examination steps, so you can focus on your patient.

Before the scan, Scan&GO saves you time and lays the groundwork for consistent results. Use the tablet to prepare everything at the patient's side, and consult it for guidance on optimal electrode positioning and a high-quality ECG signal.

Surpass your competition in cardiac imaging

During the scan, the Stellar detector enables faster imaging for shorter breath-hold times. This improves patient comfort and image quality, and helps you increase your throughput. High Power 70 delivers the highest tube current of its class, enabling improved coronary vessel enhancement. At the same time, Tin Filter technology makes possible low dose for cardiac scanning, traditionally a high-dose examination. Check&GO monitors coverage and contrast in real time, allowing you to correct problems as you work and thus avoid repeat scans. Quality-control images are sent wirelessly to the tablet, so you can review them directly at the scanner.

After the scan, Recon&GO produces ready-to-read results for instant evaluation. Zero-click CPR of the main coronaries and standard views of the cardiac planes (as recommended in the SCCT guidelines[19]) help you quickly rule out coronary artery disease. View&GO supports you in challenging cases where you need to manually interact with the images. Its intuitive and customizable tools enable smooth, straightforward reading.

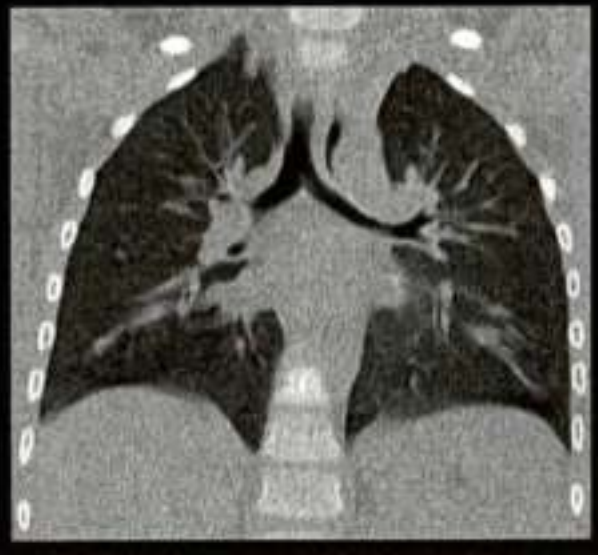


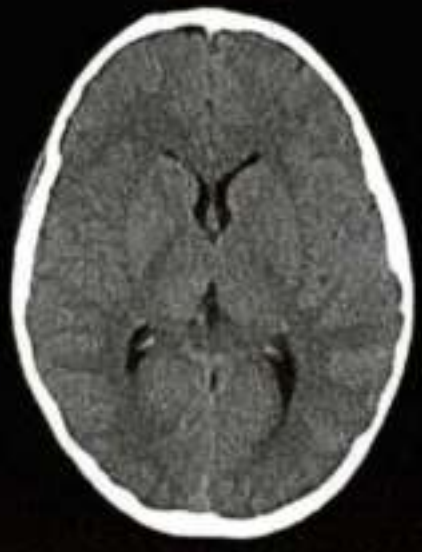
Sensitive scanning in pediatrics

For young patients – and their parents – pediatric CT can be daunting. Children are often anxious about entering the scanner, and parents worry about radiation levels. An easy-to-use system that calms patients, reduces dose, and achieves high image quality will enhance parent and child wellbeing, and boost your reputation.

Stay close to your little patients

With its mobile workflow, SOMATOM go.Top offers easy pediatric CT scanning that puts patient and parent comfort first. Scan&GO enables protocol preparation directly at the scanner, so you and the parents can stay with the child for longer. During the scan, the Halo moodlight entertains patients while you keep an eye on them with the gantry-integrated camera. These solutions also benefit image quality, since relaxed children create fewer motion artifacts.





Minimized dose levels in pediatric imaging enabled by CARE Child

Courtesy of Hospitalar de Sao Joo,Porto

Minimize dose levels for children

Minimizing dose is key in pediatrics, which is why SOMATOM go.Top is equipped with targeted solutions for reducing dose in children: CARE kV, for instance, automatically selects the lowest kV for your patient, while CARE Child offers dedicated 70 kV protocols. Our 10 kV Steps feature personalizes dose, and CARE Dose4D™ tailors mAs levels to the size and shape of the patient. Additional advanced technologies – Tin Filter, Check&GO, and SAFIRE[2] iterative reconstruction – help you scan accurately at low doses and achieve excellent detail visualization for better patient care.

Another tool that enhances image quality in challenging pediatric cases is Check&GO. By automatically checking for proper coverage and contrast distribution, it gives you the consistent results you need for confident diagnoses. After the scan, Recon&GO produces automated, standardized reconstructions that allow you to devote more time to your patient.

CARE kV, 10 kV Steps, CARE Child

CARE kV automatically tailors tube voltage to each patient and clinical indication. With optimal kV levels in every case, CARE kV keeps dose low, making it ideal for pediatric imaging. It further simplifies the process by aligning the tube current with the selected kV.

Our unique 10 kV Steps feature also helps you tailor voltage to your patient. It can adjust the level at intervals of 10 kV for less dose and high contrast resolution.

CARE Child offers targeted solutions for minimizing radiation exposure while maintaining diagnostic image quality. Pediatric protocols automatically set a low tube voltage – usually 70 kV, as SOMATOM go.Top has the highest tube current in its class – while CARE Dose4D™ optimizes dose distribution and offers special modulation curves.

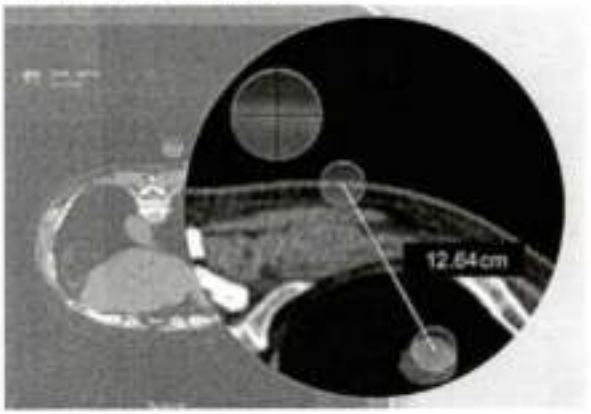
Guide&GO: intuitive functions in CT-guided intervention

CT-guided interventions play a major role in healthcare. In the U.S. alone, almost one in two sites performed at least three such procedures every day in 2016.[5] Dedicated technology that can simplify workflows and maximize safety will help you optimally handle these procedures and patients.

Tin Filter

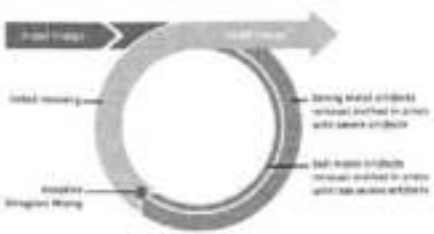
Interventional procedures usually require multiple scans. Tin Filter reduces dose in each of them. At the same time, it enhances contrast between soft tissue and air. This results in significantly less accumulated dose for both patients and interventionists. By reducing beam hardening artifacts, Tin Filter is an important improvement also for other CT-guided intervention techniques, such as spinal injections.

Magnifying glass functionality



iMAR

Artifacts due to metal implants or to the tool used in the interventional procedure (e.g., RF ablation) often hamper image quality. In these cases, accurate targeting can be impossible. iMAR[1], which is smoothly integrated into the tablet workflow, reduces these artifacts – and improves confidence even in areas adjacent to metal implants.



Simple and familiar tablet operation

SOMATOM go.Top features Guide&GO, the first tablet-based solution for CT-guided interventions. Built on the new mobile workflow, it is both familiar and easy to use. You can control the entire intervention with the tablet and the remote control – no need for ceiling-mounted displays or joysticks – and the tablet cover means you can use it even in sterile environments.

Needle guidance is supported by the highly intuitive image manipulation functions we know from our smartphones, like zoom or pan. You can also save table positions for simple patient positioning and accelerate workflows with an auto-repeat function for sequential scans.

Additionally, Guide&GO voice control eases the tablet operation with dedicated vocal commands and keeps your hands free.

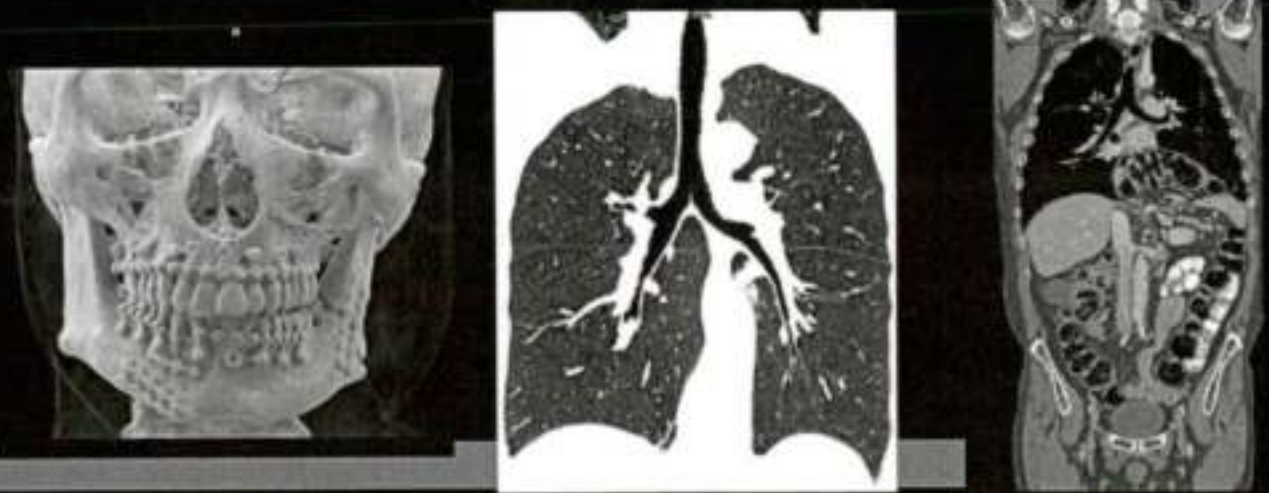
Safe and accurate at low dose

In terms of safety, Tin Filter technology reduces dose to protect the patient and the interventionist.

For precision in your work, intuitive touchscreen functions at your fingertips help you quickly find the right position for the needle and measure relevant distancies with the support of a magnifying glass functionality. Fast toggling between predefined image windowing or between the i-sequence and the spiral planning scan makes it easy to cross-check the anatomy. Laser crosshairs offer additional accuracy and confidence. Finally, the flexible goose-neck tablet holder can be adjusted to your individual needs for a safe and comfortable working environment.

Excellent image quality
thanks to innovative high-quality
imaging technologies

Patient-centric technologies



Courtesy of Erlangen University Hospital, Erlangen, Germany[1]

Routine clinical fields are a core part of the CT spectrum. It is essential for CT facilities to have fast and efficient routine processes that deliver consistency in these areas. With FAST Topo, the topogram scan is now always performed with ultra-fast 20 cm/s. Our guided workflows and cutting-edge technologies allow you to stand out by optimally adapting routine imaging to each and every patient.

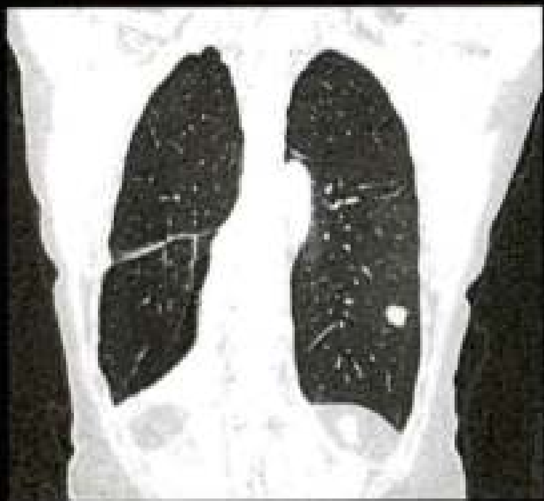
With consistent results and new benchmarks in low-dose imaging, SOMATOM go.Top enhances outcomes in oncology and opens up new potential for preventive care. In vascular imaging, you and your patients can benefit from low-kV technologies that help reduce dose even further while enhancing contrast for outstanding image quality. Our Stellar detector, known for its reduced electronic noise and excellent low-contrast differentiation, allows high-resolution orthopedic scanning at X-ray dose levels. In addition, its gray/white matter differentiation improves patient outcomes in routine neuro examinations.

High spatial resolution

SOMATOM go.Top features continuous 0.6-mm collimation across the full width of the Stellar detector. It achieves uniform scanning over longer ranges at high spatial resolution and speed. Also, the detector always provides the thin-slice data necessary for flexibility in postprocessing.

The Stellar detector is equipped with an advanced 3D antiscatter grid for precision imaging. This high-end technology is carefully manufactured to achieve excellent grid homogeneity. It minimizes scattered radiation and cross-talk, so you can use less radiation to produce outstanding, high-resolution images with minimal noise.

Fast and consistent low-dose imaging in oncology
due to powerful low-kV imaging or Tin Filter technology



Courtesy of Erlangen University Hospital, Erlangen, Germany

Fast, reliable scanning in oncology

Oncology is by far the most common indication for CT exams today. Oncology patients typically undergo multiple CT scans during their lifetime – for staging, therapy planning, and follow-up. Low doses and low-contrast resolution are therefore essential for optimal patient care.

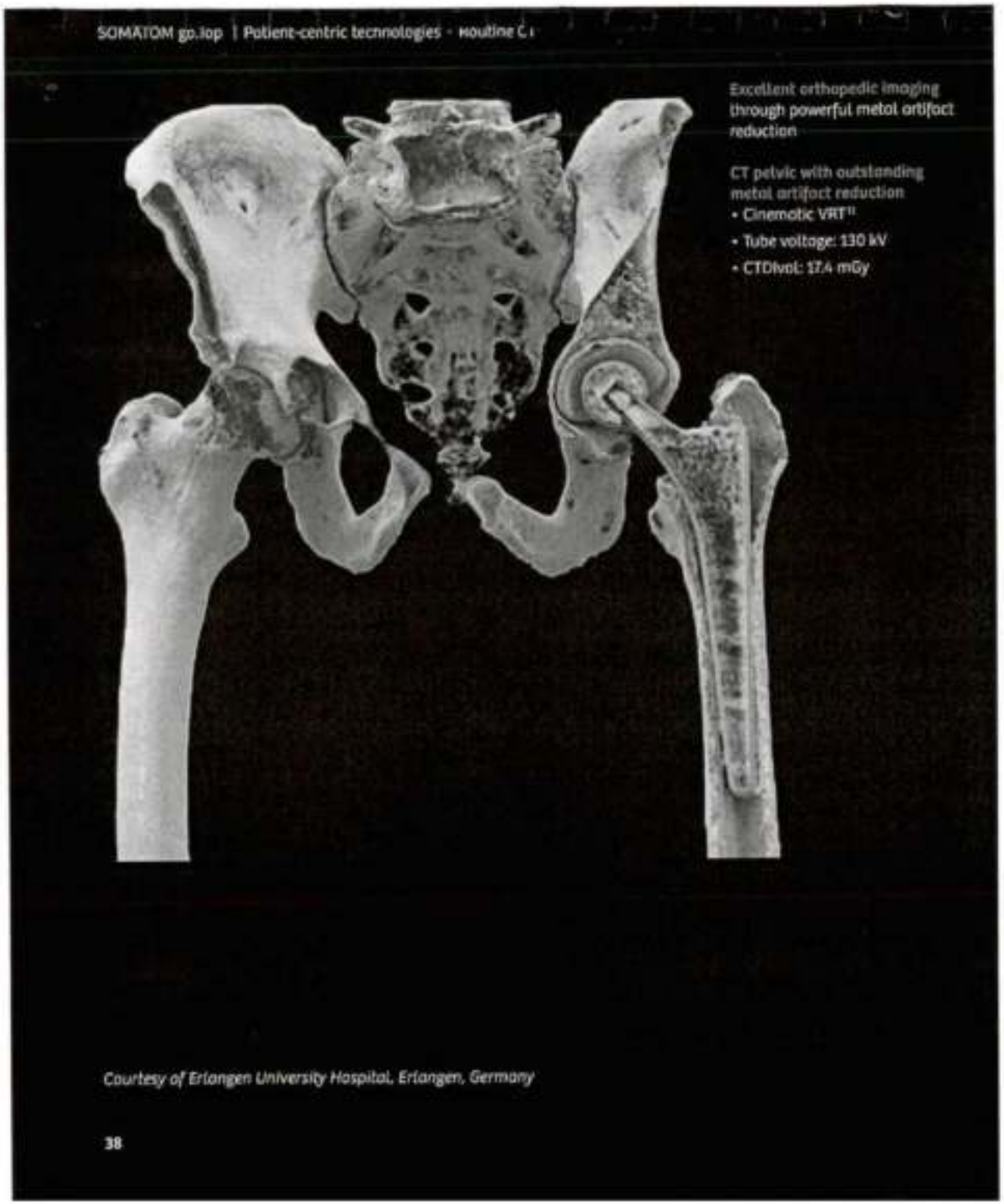
SOMATOM go.Top delivers low-dose scanning and consistent, reliable results in oncology. This is possible thanks to advanced solutions such as TwinBeam Dual Energy. The sophisticated acquisition technology helps you detect lesions more confidently and reduce contrast media, dose, and follow-up examinations.

Another low-dose technology, Tin Filter, paves the way for lung cancer screening and CT colonography procedures – and since every examination benefits from sub-millimeter collimation, you can scan quickly, reduce motion artifacts, and achieve supersharp images. Finally, CT View&GO equips you with dedicated second-reader tools to identify and segment lung nodules, and with an endoscopic view for support during virtual colonoscopies.

Tin Filter

Inherited from high-end dual-source scanners, Tin Filter technology cuts out lower energies to reduce dose and optimize contrast between soft tissue and air. By also performing the topogram scan with Tin Filter, the overall CT dose can be reduced even further.

Clinical experience also shows that Tin Filter technology reduces beam-hardening artifacts and improves image quality in bony structures, making it extremely useful in orthopedic examinations.



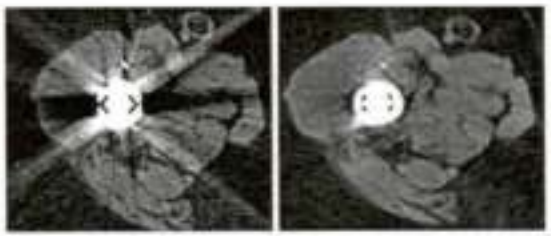
Excellent orthopedic imaging through powerful metal artifact reduction

CT pelvic with outstanding metal artifact reduction
- Cinematic VRT[1]
- Tube voltage: 130 kV
- CTDIvol: 17.4 mGy

Courtesy of Erlangen University Hospital, Erlangen, Germany

iMAR

iMAR[14] (iterative metal artifact reduction) reduces metal artifacts for better image quality with no increase in dose. The high-end algorithm can handle a wide variety of metal implants for smoother, more efficient workflows. It even allows you to address more challenging cases, such as those involving dental fillings, extremity implants, coils, and pacemakers. Diagnostic value can be further strengthened with the combination of iMAR and SAFIRE iterative reconstruction to further reduce dose. A strong imaging combination, which is smoothly integrated into your daily orthopedic workflow.



Precision orthopedic imaging

Orthopedic imaging demands precise low-dose scanning, long ranges, and high spatial resolution. For optimal outcomes, you also need technology that can handle metal artifacts and thus maintain image quality.

SOMATOM go.Top delivers high-quality scanning for all types of patients at X-ray dose levels. Tin Filter technology improves results at the interface of soft tissue and bone, while thin slices enhance accuracy and spatial resolution for visualizing small bony structures and fractures. Recon&GO reduces postprocessing steps with zero-click, anatomically corrected orientations for reliable diagnosis. The combination of TwinBeam Dual Energy acquisition and the iMAR[14] algorithm achieves excellent metal artifact reduction without increasing dose.

Excellent contrast-to-noise ratio
through powerful low-kV and Stellar detector imaging, facilitated with GO technologies

Courtesy of Erlangen University Hospital, Erlangen, Germany[1]

Simple, sharp vascular imaging

CT angiography for vascular imaging is now routine in many institutions. High-quality angiography exams need good iodine enhancement, sub-millimeter slices, and precise timing. SOMATOM go.Top equips you with the advanced technology you need to handle each individual patient and differentiate yourself in this important field.

By allowing you to scan at 70 kV, High Power 70 delivers low dose and the high iodine contrast that is key to vascular imaging. For proper contrast distribution, you can rely on support from FAST ROI and Check&GO, while thin-slice imaging brings you optimal resolution and fast scan speed every time.

Our sophisticated TwinBeam Dual Energy acquisition technology helps you achieve excellent bone removal – even in complex vasculature such as the supra-aortic arteries – and distinguish clearly between calcified plaques and iodine contrast. Once you are finished with the scan, Recon&GO saves you time with zero-click postprocessing and inline CPR.

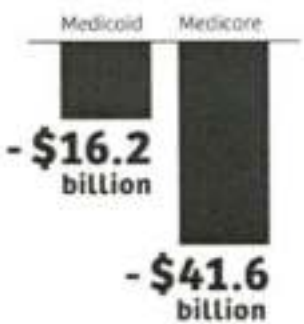
High Power 70

High Power 70 allows you to scan at 70 kV with up to 825 mA. The Athlon™ tube is responsible for this impressive value and is the reason why SOMATOM go.Top offers the highest tube current in its class. Scanning at such a low voltage achieves better iodine contrast for sharper images, even in small distal vessels. The improved contrast also enables considerable reductions in the amount of contrast media. By lowering dose and contrast, you can include more patients, deliver better patient care, and reduce examination costs.

High Power 70 is based on the mass attenuation coefficient. For lower photon energies, the mass attenuation coefficient of iodine increases, whereas soft tissue is less energy-dependent. This means that the iodine-to-soft-tissue contrast in the CT image will increase with low-kV imaging and lower average photon energy. This increase is extremely beneficial for contrast-enhanced studies.

Thinking business

Financial considerations are an important driver in today's CT business. Whether it is about expanding your portfolio or reducing overhead expenditure, a new CT scanner should help you lower running costs and increase revenue.



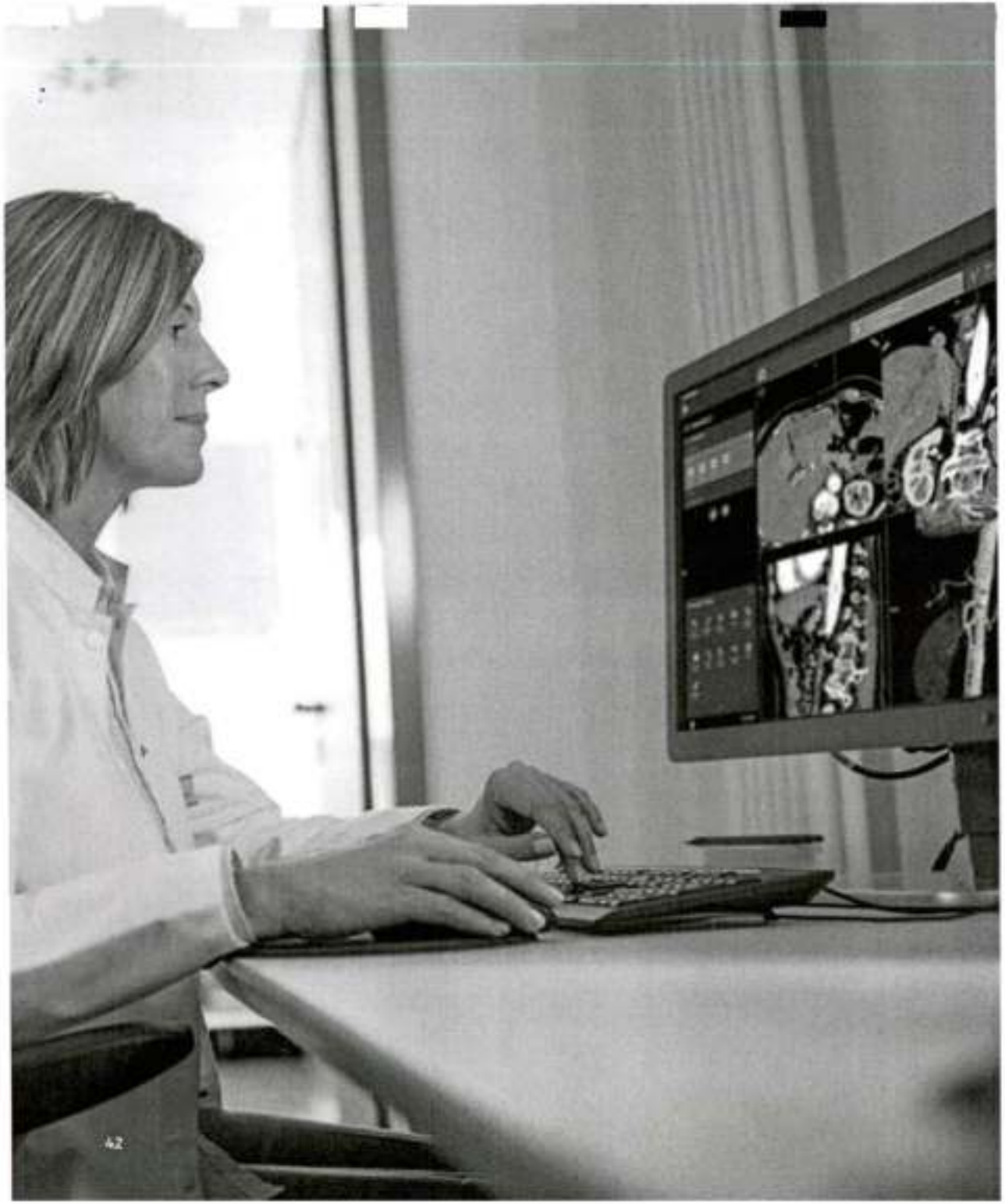
Underpayment by Medicaid and Medicare

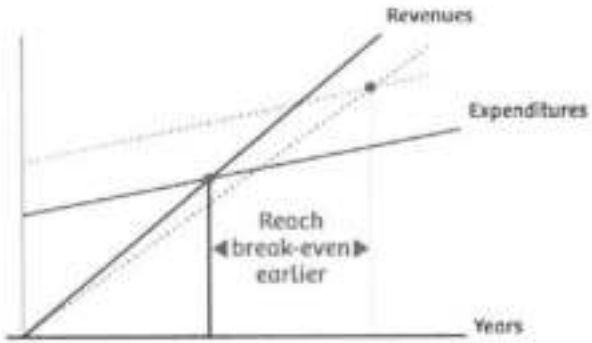
Comparing cost and reimbursement received in 2015, U.S. hospitals faced a combined USD 57.8 billion in underpayment,[2] forcing healthcare providers to find ways to keep costs as low as possible.

What can be done to still ensure high-quality services?

Go for business growth with an all-in-one solution

SOMATOM go.Top features a flexible all-in-one solution that covers everything you need around the scanner. For optimal balance between cost position and your growing needs.





Without SOMATOM go.Top — With SOMATOM go.Top

A boost for your business

Setting yourself apart with a wide variety of clinical cases is a chance to give your CT business a new push forward. Our guided workflows in Dual Energy, for instance, have the potential to significantly improve your reputation. Additional revenues can also be generated through higher throughput – based on quicker positioning, simplified workflows, and the high-performance Athlon* tube. Add to that lower installation expenditure and running costs, and you'll see why we say that the SOMATOM go. platform was built to make success your daily business.

Low installation costs

A key aim of the overall SOMATOM go. platform was to minimize your installation costs. Two related elements that enable this are the new workplace design and the flexible room concept. Thanks to gantry-integrated computers, you no longer need to invest in a separate control room. No matter which of the following three concepts you choose, your operators are fully protected while the X-ray is on:

- A Niche setup in the examination room
- B Workstation outside the room, for example in the corridor
- C Traditional control room setup

With the new injector arm, installation costs for ceiling mounting of the injector are also a thing of the past. This means you don't have to adapt your infrastructure to the scanner – SOMATOM go.Top adapts to you, so installation costs stay low.

Maximize patient throughput

Scan preparation gets much more efficient with Scan&GO. The same is true for scan wrap-up with Recon&GO. Combine this with the Athlon® tube with its high-end cooling technology, and SOMATOM go.Top helps you achieve a whole new level of patient throughput.

CT View&GO makes reading much easier and more efficient, providing all tools in one workflow. The tools of CT View&GO are now also available as a standalone solution with optional hardware for additional flexibility. This syngo.via View&GO provides the ideal performance boost when higher throughput needs to be managed. Offering integrated cross-specialty viewing, and supported by a brand-new software only concept, it is an all-in-one solution that comes with the same tools and the same look-and-feel as your scanner interface. Therefore, you will not need additional training for your staff. And because you won't have to invest in further software licenses, it keeps your initial investment low. Just set your workplace up and run it – to manage more patients and increase reimbursements.

Siemens Healthineers Connect Plan

The Siemens Healthineers Connect Plan[21] is an all-new service plan that comes standard with the investment of SOMATOM go.Top. It fully utilizes the capabilities of the connection to our digital platforms – SRS, PEPconnect[22], LifeNet – and to our remote services. This allows you to receive seamless support. It covers the second and third year after system purchase and gives you the financial confidence of premium service, matching your total cost of ownership requirements. Additionally, you can optionally upgrade to a full service contract.

Siemens Healthineers Connect Plan[21] in detail

Our service plan[21] is an entirely new approach to improving scanner uptime, affording you financial certainty from day one. With many aspects of service – including spare parts[22] – covered in the scanner purchase price, you can look forward to higher uptime, improved workflows, efficient support, and streamlined training.

The system performance part of the service package offers onsite preventive maintenance that will identify potential issues and resolve them before they become a problem. It also allows you to perform straightforward tasks yourself – such as installing software updates – which means you can schedule them for times that fit into your workflows.

In terms of support, the connection between SOMATOM go.Top and the certified Smart Remote Services infrastructure allows our experts to keep an eye on the system and take corrective action if problems appear. It also means we can offer remote desktop sharing to guide you through protocols and examinations. If you encounter a fault with the scanner, FAST Contact™[21] allows you to raise a service ticket easily. This triggers a call-back from our experts, who provide quick support to customers whenever they need it.

Blended learning with PEPconnect

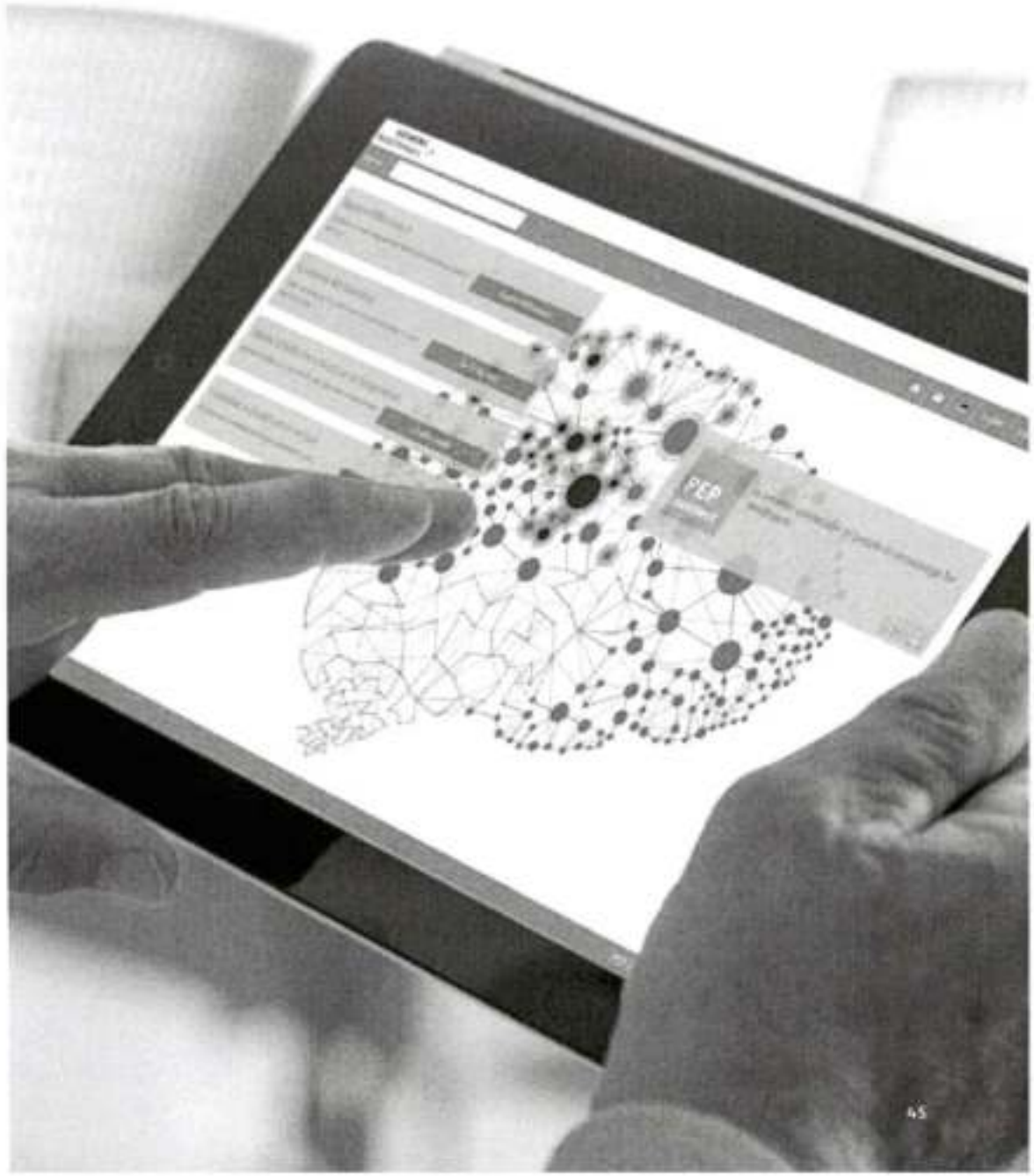
Improve your skills and qualifications with the industry's first online personalized education experience – PEPconnect.[1]

The purchase of SOMATOM go.Top gives you access to blended learning and performance support activities on PEPconnect enhancing performance and competency.

With PEPconnect, you can begin your training even before the arrival of your SOMATOM go.Top system. And with multidevice accessibility, you experience your choice of learning sessions anytime and anywhere.

Benefit from the broad portfolio of competency-based performance support and social learning activity within PEPconnect, providing individual learning experiences in the healthcare world.

Stay on top in your profession with PEPconnect and make a difference in your patients' lives.

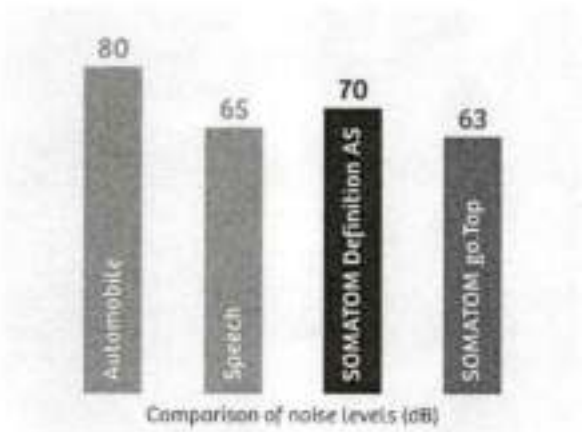


Further highlights

SOMATOM go.Top combines technical solutions from high-end scanners with brand new innovations. Profit from proven Siemens Healthineers technology for smart data analysis and gentle sound design – and discover practical new features.

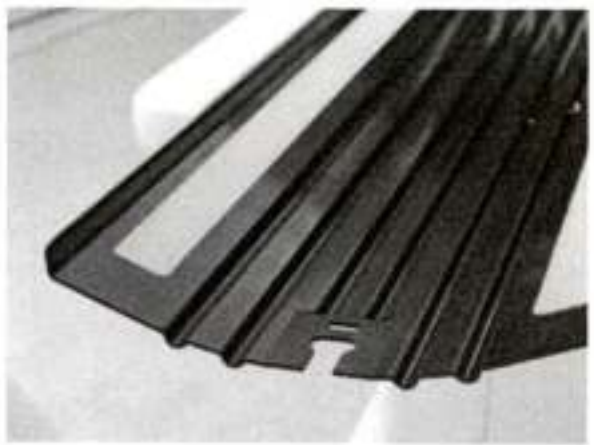
teamplay apps

With SOMATOM go.Top and our cloud-based performance management solution teamplay, you will get a transparent overview of your system data. teamplay helps you identify areas of improvement and monitor your imaging fleet's performance. In addition, it distributes one master protocol to all your SOMATOM go. scanners – for consistent quality.



Gentle voice and sound design

SOMATOM go.Top is designed for less noise – and reduced sound pressure for patients and staff. Thanks to targeted suppression of noise as well as optimized fan location and airflow, our gentle sound design improves your working environment and increases patient comfort. Furthermore, allow patients to benefit from gentle voice guidance of breathing instructions due to a new voice design, intended to reduce motion artifacts.



New tabletop

The redesigned tabletop is thinner and allows X-ray to penetrate the material more easily. This means less attenuation due to scattering and absorption – resulting in less image noise. The new tabletop is therefore an important contributor to low-dose imaging.

Optional High Performance Package

Benefit from additional operational and clinical flexibility by configuring your SOMATOM go.Top with the High Performance Package, a bundle of software and hardware options to boost your performance.

High Power 70

Extraordinarily high tube currents of up to 825 mA (the highest in this class of scanner) allow you to scan virtually every patient at the optimal kV level (down to 70 kV) for enhanced iodine contrast and lower dose.

iMAR

iMAR[1a] (iterative metal artifact reduction) reduces artifacts in a wide variety of clinical situations – for higher image quality.

High speed 0.33 s

Increased volume coverage with a faster rotation time (0.33 seconds), providing extended clinical capabilities and reduced motion artifacts.

Additional features for CT View&GO

Spine Ranges: guided reconstruction of anatomically aligned spine curved planar reconstructions (CPR).

Lung CAD: highly sensitive and specific in lung nodule detection.

***syngo*.CT CoScoring:** provides total and relative Calcium Scoring with Coronary Age calculation based on trial data.

Additional features for Recon&GO

Inline Spine Ranges: time savings for a complete spine reconstruction, while reducing the risk of mislabeling.

Inline Rib Ranges: automated rib labeling and numbering.

Inline Lung CAD: assistance in the detection of pulmonary nodules during review of CT examinations.

Technical specifications

Key data

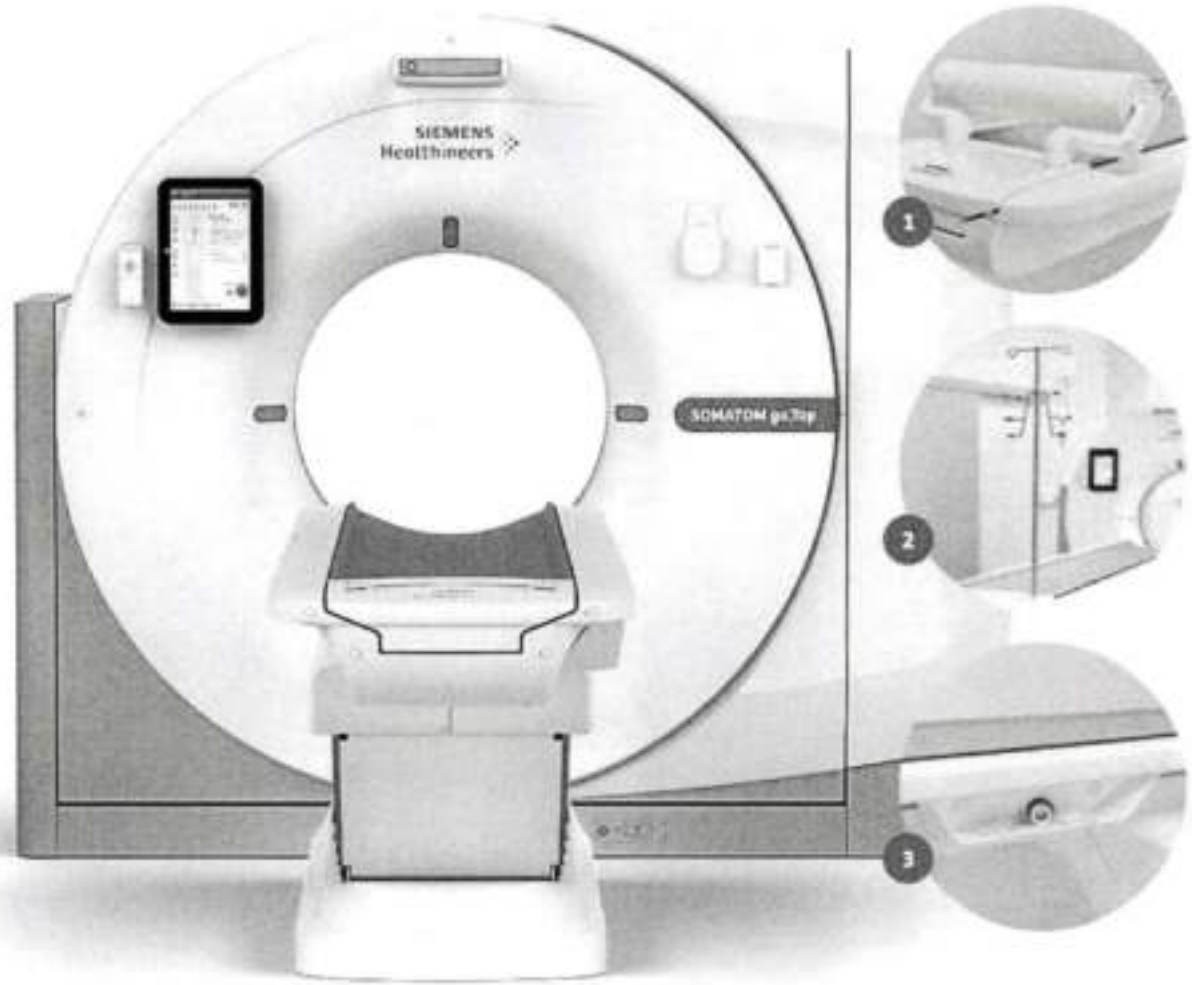
Slices	128 (iVR)
Rotation times	up to 0.33 s
Tube	6.0 MHU (15.0 MHU equivalent value)
Power	75 kW (187 kW equivalent value with SAFIRE [2])
High voltage	70–140 kV in 10 kV steps, Sn100, Sn110, Sn120, Sn130, Sn140
mA	up to 825 mA
z-coverage	3.84 cm
Max. table load	up to 307 kg

Innovative hardware

SOMATOM go.Top has a patient table with a scannable range up to 160 cm that can hold up to 227 kg. The table is equipped with newly designed accessories such as

1. a paper roll holder,
2. an infusion stand, and
3. a storage box on the side.

Upgradable to the table that can hold up to 307 kg and has an extended scannable range of 200 cm.



Why Siemens Healthineers?

At Siemens Healthineers, our purpose is to enable healthcare providers to increase value by empowering them on their journey towards expanding precision medicine, transforming care delivery, and improving patient experience, all enabled by digitalizing healthcare.

An estimated 5 million patients globally everyday benefit from our innovative technologies and services in the areas of diagnostic and therapeutic imaging, laboratory diagnostics and molecular medicine, as well as digital health and enterprise services.

We are a leading medical technology company with over 170 years of experience and 18,000 patents globally. With more than 48,000 dedicated colleagues in 75 countries, we will continue to innovate and shape the future of healthcare.

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healthcare.siemens.com/news

Footnotes

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20 *In clinical practice, the use of SAFIRE may reduce CT patient dose depending on the clinical task, patient size, anatomical location, and clinical practice. A consultation with a radiologist and a physicist should be made to determine the appropriate dose to obtain diagnostic image quality for the particular clinical task. As determined from SOMATOM Definition Flash data, SAFIRE enables up to 60% dose reduction. Data on file.*

21 *Powered by Smart Remote Services. Siemens Healthineers Connect Plan is subject to regional adoptions/restrictions.*

22 *PEPconnect availability is subject to regional restrictions.*

23 *Excluding X-ray tube and tablet. Additional tube and tablet coverage solutions are optionally available.*

24 *Requires LifeNet access – subject to country-specific availability.*

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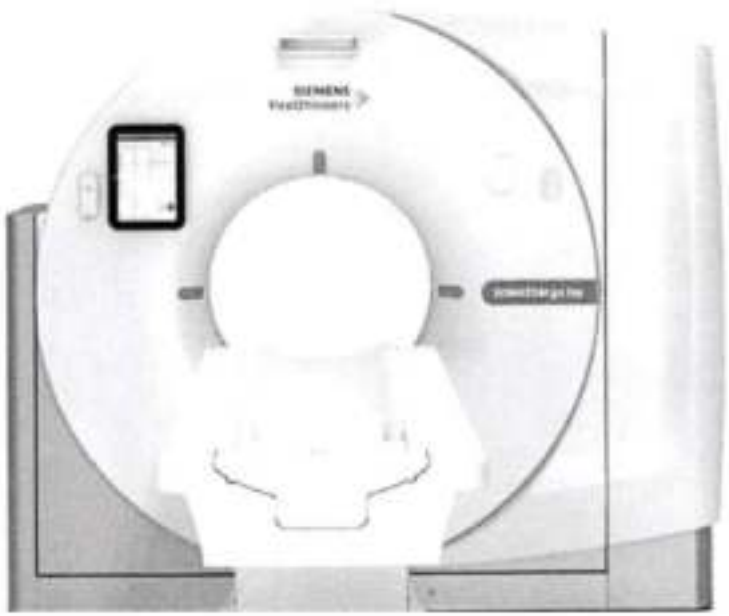
Data sheet

SOMATOM go.Top

128-slice configuration
syngo CT VA40

siemens-healthineers.com/somatom-go-top



Make Success your Daily Business

The SOMATOM go. platform

In a market characterized by intense competition, more selective patients, and reimbursement cuts, healthcare providers must find ways to leverage technological advancements and secure income and referrals. To keep the business running, it is crucial for CT departments to differentiate themselves and deliver excellent patient-centered care.

To help you succeed day after day, we developed the SOMATOM® go. platform. As a member of this family, SOMATOM go.Top supports all users to provide the best scan for every type of patient – no matter the clinical demands and challenges. The scanner features a unique tablet-based mobile workflow, user guidance with our GO technologies, and exclusive innovations such as Tin Filter low-dose technology.

Stand out in Advanced CT Procedures

SOMATOM go.Top

SOMATOM go.Top starts the era of intelligent CT imaging powered by myExam Companion. It enables you to confidently offer specialized CT procedures, including Dual Energy.

Combined with patient-centric technology and workflows to optimally adapt to each type of patient, all operators

Highlights

myExam Companion

SOMATOM go. platform starts the era of intelligent CT scanning with myExam Companion. With it, AI turns aggregated data into built-in expertise to automatically leverage the full potential of technologies – regardless of where, when, and by whom the results have been produced. This allows for reliable and reproducible results from day one. myExam Companion means performing all advanced CT examinations as perfectly and quickly as if they were routine, allowing even unexperienced users to find the best combination of parameters for every individual patient and procedure. Personalized imaging for precise dose and contrast media optimization, reduced unwarranted variations, and always consistent results for enhanced diagnostic experience.

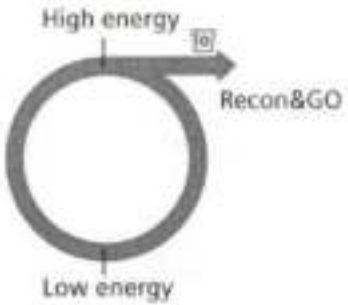
The new Mobile Workflow and GO technologies

A central element of optimizing performance and generating daily revenue is an entirely new approach to operating the scanner. Built around a new Mobile Workflow, the SOMATOM go.Top features a line-up of innovative solutions – tablet, remote control, camera, and a new workplace design – that bring an unparalleled level of flexibility and mobility to daily CT routines.

myNeedle Companion

The work of interventional radiologists can be challenging. More and more biopsies, ablations, and related procedures need to be performed.[1,2] The fact that imaging modalities come with many different user interfaces and settings further complicates interventions. Therefore, it is time to increase workflow productivity. With the SOMATOM go. platform we are introducing myNeedle Companion[3,4], the first Siemens Healthineers solution that harmonizes planning and guidance for percutaneous needle procedures across modalities. Workflow and user interface offer the same experience on both angiography and CT systems. In addition, the SOMATOM go. platform offers for CT-guided interventions a tablet-based in-room control with smartphone-like functions to easily interact with the CT scanner to stay close to the patient and to work independently aiming for improved efficiency.

Highlights



Holistic Dual Energy solution

SOMATOM go.Top offers a holistic solution with two Dual Energy modes that makes DE routine ready for all patients and situations – completely neutral in dose and workflow TwinSpiral offers the possibility to acquire two spiral data sets at different energies. Thanks to the spectral properties of the Tin Filter, Twin-Spiral DE allows a better spectral separation for non-contrast examinations, whereas TwinBeam Dual Energy[1] is especially useful for characterizing contrast media examinations since it acquires low and high-kV datasets in a single scan. By allowing you to characterize, highlight, and quantify different materials, Dual Energy gives you greater diagnostic confidence with virtually all patients. And combined with dedicated optional Spectral Viewing packages it allows for comprehensive assessment. No matter if you would like to do your postprocessing directly at the acquisition console or rather have it sent automatically to PACS by Recon&GO – it offers a solution for all clinical workflows.

Tin Filter and Stellar detector

Inherited from high-end dual source scanners, the Tin Filter (Sn) cuts out lower energies to reduce dose and optimizes contrast between soft tissue and air. This has direct benefits in lung and colon imaging, for example. Clinical experience also shows that Tin Filter technology reduces beam-hardening artifacts and improves image quality in bony structures, making it extremely useful in orthopedic examinations.

One enabler for this high image quality in combination with ultra-low dose is the Stellar detector with fully integrated components and an advanced 3D anti-scatter collimator. Being perfectly attuned with advanced iterative reconstruction from SAFIRE it keeps electronic noise low, increases dose efficiency, and improves spatial resolution. Providing excellent and homogeneous image quality, even in complex areas, such as the base of the skull, it becomes especially relevant for routine neuro imaging.

System Configuration

Standard system hardware

- 0.5, 1.0 s rotation time
- Stellar detector based on Multislice UFC (Ultra Fast Ceramic)
- 70 cm bore size
- 75 kW; equivalent to 187 kW with SAFIRE[1]
- Athlon® X-ray tube
- Adaptive Dose Shield
- Tin Filter
- Ultra-FAST IRS
- CT patient table (227 kg/500 lbs table load)
- Tablet (12"/30.5 cm) for Mobile Workflow

Hardware options

- 0.33 s rotation time
- FAST 3D Camera
- CT patient table (307 kg/676 lbs table load)
- Patient table foot switch
- X-ray foot switch
- Dual 24"/60 cm flat screen monitor with dual display functionality
- 24" or 32" ceiling mounted monitor with or without radiation protection support
- 24" monitor on cart
- myExam Satellite
- Integrated Injector Arm

Mobile Workflow support[2]

- Additional tablets (up to 3 supported in total)
- Wall-mounted/desk docking stations as additional charging spots for the tablets and remote control

Standard workplace

- 24"/60 cm flat screen monitor
- External USB 3.0 disks support

High Performance Package[2]

- Cardio Spiral functionality
- Cardio BestPhase
- syngo.CT CaScoring
- Recon&GO including:
  - Inline Spine Ranges
  - Inline Radial and Parallel Rib Ranges
  - Inline CaScoring
- CARE Contrast

Standard system software and applications

- syngo Examination
- syngo Archiving & Network
- SureView
- IVR (Interleaved Volume Reconstruction)
- Dynamic serio scan
- HD FOV
- Video Capture and Editing Tool
- Screen recorder
- Exam Designer
- WorkStream4D (direct 3D-recon)
- Adaptive Signal Boost
- syngo System Security

myExam Companion

- myExam Compass
- myExam Cockpit[2]

Standard GO technologies

- Scan&GO
- Check&GO incl. FAST ROI:
  - Coverage
  - Contrast media
  - Metal detection
- Recon&GO including:
  - Inline Anatomical ranges
  - Inline Table removal
  - Inline Bone removal

System Configuration

Standard FAST technologies

- FAST Planning @ AWP
- FAST Planning @ Scan&GO tablet
- FAST ROI
- FAST Contact
- FAST Adjust

FAST 3D Camera[1]

- FAST Isocentering
- FAST Range
- FAST Direction

FAST computers[1]

- Ultra-FAST IRS II
- Ultra-FAST AWP II

Standard CARE technologies

- CARE kV
- 10 kV Steps
- CARE Child
- CARE Dose4D
- CARE Topo
- CARE Profile
- CARE Filter
- Flex Dose Profile
- CARE Bolus CT
- CARE Test Bolus
- X-CARE
- SAFIRE® (Sinogram Affirmed Iterative Reconstruction)

Optional CARE applications

- CARE Contrast
- ADMIRE® (Advanced Modeled Iterative Reconstruction)

Optional system software and packages

Emergency Imaging[1]

- Trauma Layouts
- Recon&GO – Inline Skull Unfolding
- Recon&GO – Inline Brain Hemorrhage

Spectral Imaging with Dual Energy

- TwinSpiral Dual Energy
- TwinBeam Dual Energy[1]
- TwinSpiral Spectral Viewing[1]
- TwinBeam Spectral Viewing[1]
- Recon&GO – Spectral Recon[1,2]
- Advanced Dual Energy packages[1]

Applications for fleet management

- Shui® – the Siemens Healthineers Design System
- teamplay BASIC
- teamplay CORE[1]
- syngo Expert-i[1]
- syngo Virtual Cockpit[1]

Standard software applications for Radiation Therapy

HD FOV

Optional hardware and software applications for Radiation Therapy

- Radiation Therapy Basic
- Respiratory Motion Management
- FAST 4D
- Varian RGSC interface
- ANZAI interface
- Open interface
- DirectDensity
- Direct Laser Steering
- 227 kg Patient Table RT
- 227 kg Multi-index RTP overlay

System Hardware

Gantry

Aperture
70 cm / 27.6"

Depth
84 cm / 33"

Distance scan plane to gantry cover
- 25 cm / 9.84"
- The short distance from the gantry front to the scan plane allows for easy operator access.

Distance focal spot to isocenter
53.5 cm / 21.1"

Distance focal spot to detector
97.6 cm / 38.4"

Scan field
- 50 cm / 19.7"
- 70 cm / 27.5" with HD FOV[1]

Physical tilt
Up to ± 30°[2]

Rotation time
0.33[3] s, 0.5 s, 1.0 s

Halo (incl. 2D Camera, Visual countdown, Mood Lighting)

Keep a close eye on the patient for the rest of the examination time. Its 90° viewing angle gives you a view of the tunnel on the stationary monitor. In addition to the camera, the Halo assembly includes ambient mood lighting and a digital visual countdown to help them comply with breath-hold times.

Three laser light markers
Coronal, sagittal, transversal laser light showing the isocenter position of the scan plane

Integrated injector arm[4]

System Hardware

Tube Assembly

Tube
Athlon liquid metal bearing X-ray tube

Tube current range
- 13–625 mA
- 13–825[1] mA
- Max. tube current equivalent to 1560/2060[1] mA utilizing SAFIRE

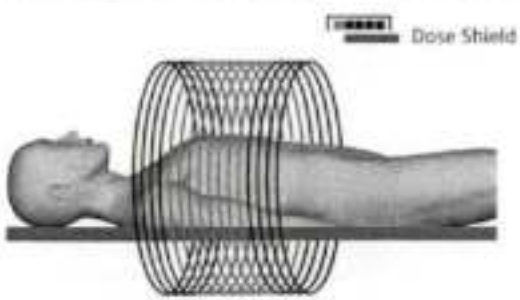
Tube voltage
- 70–140 kV in 10 kV steps
- Sn100, Sn110, Sn120, Sn130, Sn140

Tube anode heat storage capacity
- 7.0 MHU; equivalent to 17.5 MHU with SAFIRE
- With iterative reconstruction technology the same clinical results can be achieved with less dose at maintained image quality. Therefore when using less dose the heat storage fills up more slowly.

Tube cooling rate
Up to 1700 kHU/min

Focal spot size according to IEC 60336
- 0.8 x 0.8/7°
- 1.0 x 1.2/7°

Adaptive Dose Shield



Tin Filter

Inherited from high-end dual-source scanners, Tin Filter technology cuts out lower energies to reduce dose and optimizes contrast between soft tissue and air.

This has direct benefits for imaging areas such as the lungs, colon, and sinuses. In addition, clinical experience shows that Tin Filter technology reduces beam-hardening artifacts and improves image quality in bony structures, which means it is also extremely useful in orthopedic examinations. As a result, you get CT imaging at exceptionally low dose levels, comparable to conventional X-ray.

Tin Filter technology protects you and your patients with ultra-low doses during intervention. Factory protocols for low-dose lung cancer screening, colon and sinus employing the Tin Filter. Provide dose savings, even during the topogram. Only Siemens Healthineers CT scanners enable lung imaging powered by Tin Filter technology.

Generator

Max. power

System Hardware

Data Measurement System

UFC (Ultra Fast Ceramics)

The Stellar detector boosting an integrated circuit detector technology, where photodiode and electronics are integrated on one single integrated circuit. It has been shown in literature that this design allows superior imaging compared to conventional detector circuit designs, supporting:

- Superior objective and subjective image quality in head CTs
- Reduced image noise and streak artifacts, especially in low dose or low kV imaging or in high attenuation areas such as the shoulder and pelvis regions
- Improved image quality and low-contrast detectability in abdominal CT of overweight or obese patients
- Lower image noise and improved image quality in coronary CTA and coronary stent imaging
- Speed and efficiency based on Siemens Healthineers' proprietary scintillator material with ultra-short decay, extremely low afterglow and high absorption for optimized image quality and high dose efficiency

Max. number of slices/rotation
- 64 (acquired slices)
- 128 (with IVR)
- Max. 384 (reconstructed slices)

Number of projections 1 s/360°
1,536

Sequence acquisition modes
64 x 0.6 mm, Sn64 x 0.6 mm, Sn3 x 5 mm, 1 x 10 mm, 1 x 5 mm, 3 x 5 mm, 3 x 3 mm, Sn3 x 3 mm

Spiral acquisition modes
64 x 0.6 mm, Sn64 x 0.6 mm, AuSn64 x 0.6 mm

Adaptive Signal Boost
The Adaptive Signal Boost amplifies low signal areas of the CT data when high attenuation is present – such as when imaging obese patients or patients with metal implants or pediatric imaging at low kV.

Patient table

Max. table load
- 227 kg/500 lbs[2,3]
- 307 kg/676 lbs[1,4]

Max. table feed speed
200 mm/s

Vertical table travel range
- 46–88.5 cm/18"–35" (at table top)[2]
- 48.2–90.7 cm/19"–35.7" (at table top)[1,3]
- 47.5–90 cm/18.7"–35.4" (at table top)[1,4]

Vertical travel speed
28.3 mm/s

Scannable range
- 160 cm/63" with patient table extension[1,2,3]
- 200 cm/78.7" with patient table extension[1,4]

Patient table foot switch[1]

myExam Companion

SOMATOM go. platform starts the era of intelligent CT imaging powered by myExam Companion. myExam Companion enhances consistency of CT procedures, independent of operator skills. It helps reduce the number of protocols and complexity of advanced examinations, by suggesting which settings are more appropriate for every patient. Based on the procedure and patient characteristics it guides users to find the optimal combination of acquisition and reconstruction parameters, standardized results, and always the right dose. myExam Companion learns from your experience: establish your protocol preferences once and let it help you avoid repetitive tasks.

myExam Compass

myExam Compass offers knowledge-based guidance at the hands of the technologist supporting individual patient characterization, based on patient input (size, age, sex, ECG) and interactive questions, adaptable by users, in their own clinical language (e.g. "does the patient have a metal implant?", "can the patient hold the breath longer than 5 sec?").

myExam Compass is based on expert use and condensed knowledge from thousands of exams in our installed base.

Enhance consistency and standardization of your CT procedures by sharing myExam Compass protocols across your institution or other peers through teamplay.

Cardiac CT made easy independent of operator skills
Specially useful for users less experienced in CT Cardiac procedures, myExam Compass suggests which settings are more appropriate for every patient based on the procedure and patient characteristics, finding the optimal combination of acquisition and reconstruction parameters for excellent image quality, standardized results and always the right dose.

Dual Energy is on when you need it
Especially useful for users less experienced with the DE technique, this holistic approach, powered by myExam Compass, suggests which DE settings are appropriate for which patient based on the procedure and patient characteristics to find the optimal combination of acquisition and reconstruction parameters for standardized results, and always the right examination.

If you are not sure when to use TwinSpiral or TwinBeam or which Recon&GO results to create, just rely on myExam Compass.

Depending on factors such as the patient size, how well they can comply with breathing instructions, or what the indication is, myExam Compass will adapt the protocol settings.

Anticipate potential breathing artifacts
Anticipate potential breathing artifacts by proactively characterizing the patient's ability to comply with an acceptable breathhold. This breathhold characterization is utilized by myExam Compass to adapt scan parameters and optimize scan speed.

myExam Cockpit[1]

The central engine of myExam Compass is driven by this cockpit: the central user interface for fast and intuitive protocol configuration. In this expert mode, users benefit from high flexibility in modifying

New Workplace Design

Thanks to gantry-integrated computers, SOMATOM go.Top gives you complete flexibility over where you position the workstation. Depending on your needs and infrastructure, you can set it up in the same room, outside the scan room, or in a separate control room. The optional workplace myExam Satellite brings additional workflow flexibility without interrupting the scanning program.

Image Reconstruction

Real-time display
- Real-time image display (512 x 512) during spiral acquisition on the workplace
- Wireless transfer of images for preview on the tablet. Transfer starts immediately after the end of scanning

Slice thickness
0.6–10 mm

Wide range of freely selectable slice thickness for prospective and / or retrospective reconstruction

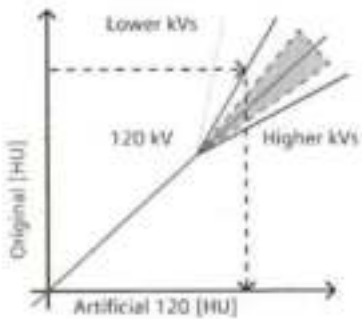
Recon field[1]
5–50 cm / 1.9"–19.7"
5–70 cm / 1.9"–27.5" with HD FOV[2]

Maximum reconstruction rate
- 23 fps for FBP, 20 fps for IR with Ultra-FAST IRS
- 40 fps for FBP, 29 fps for IR with Ultra-FAST IRS II[3]

Recon matrix
- 512 x 512
- 768 x 768[3,4]
- 1024 x 1024[3,4]

HU scale
–8,192 to +57,343

Advanced algorithms



- Iterative Beam Hardening Correction (iBHC) for reduction of beam hardening artifacts, e.g. in head images
- Any kV CaScoring enables you to choose any kV setting for your calcium scoring scan. Previously the setting was limited to 120 kV only. A specific reconstruction kernel (Sa36) is applied and allows to perform Agatston equivalent low-dose scores, even at lower kV settings.
- Large selection of reconstruction kernels to adapt to specific clinical needs

New Workplace Design

Acquisition Workplace (AWP)

Computer integrated into the gantry
Hardware integrated into the gantry to:
- Enable Flexible Room Design (see Installation part)
- Minimize the elements of the new workplace design to a monitor, keyboard, mouse and the control box

High performance computer CPU
Intel Xeon 3.5–4.0 GHz[1] with Turbo Boost Technology

RAM
- 64 GB DDR4 RAM
- 96 GB DDR4 RAM[2]

Graphics card
- Intel® HD Graphics P530[1]
- Nvidia Quadro P1000[1,2]

Hard disk
- 720 GB SSD
- 1.2 TB SSD[2]

Standard monitor
- 24"/60 cm flat screen
- 1,920 x 1,080 resolution

Additional monitor[2]
Yes

Dual monitor[2]
Yes

Image storage
- Up to 800,000 images (400 GB)
- Up to 600 GB[2]

Additional storage
External USB 3.0 disks for quick and easy raw data storage are supported

myExam Satellite[1,2]

Additional workplace sharing database and applications with the main Acquisition Workplace for a more flexible workflow:

- While the AWP is being used for protocol preparation or scanning, myExam Satellite can be simultaneously used for filming, results creation or image interpretation.
- Results and postprocessing are simultaneously available at the AWP and myExam Satellite.
- Same applications as available at the AWP for different clinical areas, including Dual Energy[2] and Neuro Perfusion[2]

Standard System Software and Applications

syngo Examination

Exam Designer

Easy and intuitive way to change and manage scan protocols

Topogram

Length
- 128–1,680 mm / 5–66" with table extension[1]
- 128–2,080 mm[1,4] / 5–82"[1] with table extension[1]

Scan speed
200 mm/s

Scan times
- 1.36–8.76 s
- 1.36–10.76 s[1]

Views
a.p., p.a., lateral

Real-time topogram

Manual interruption possible once desired anatomy has been imaged

Topogram scan using Tin Filter for further dose reductions

Patient Communication

Integrated patient intercom

Automatic Patient Instruction (API)
- Freely recordable
- 7 API text pairs for respective languages available
- Presets in 40 languages available

Sequence Acquisition

Reconstructed slice widths
0.8, 1.0, 1.5, 2, 3, 4, 5, 6, 7, 8, 10 mm

Partial scan times (240°)
0.22[1], 0.33, 0.67

Scan times (full scan)
0.33[1], 0.5, 1.0 s

Acquisition with or without table feed

Dynamic Serio Scan

Automatic clustering of scans

Multislice Spiral Acquisition

Reconstructed slice widths
0.6, 0.8, 1, 1.5, 2, 3, 4, 5, 6, 7, 8, 10 mm

Temporal resolution
- 165 ms[1]
- down to 83 ms[1] (bisegment)

Scan times full scan (360°)
0.33[1], 0.5, 1.0 s

Reconstruction increment
Min. 0.1 mm

Pitch factor
- 0.15 – 1.5
- Down to 0.03
  (optional with Respiratory Motion Management)

Spiral scan time
Max. 300 s

Scan length
- Max. 160 cm / 63" with patient table extension[1,2,3]
- Max. 200 cm / 78.7" with patient table extension[1,4]

Standard System Software and Applications

syngo Examination

WorkStream4D

With Workstream4D, thin slice data reconstruction is not required prior to the production of reformatted images.

This enhancement saves time when compared to alternative MPR techniques4D workflow with direct generation of axial, sagittal, coronal, or double-oblique images from standard scanning protocols.

Elimination of manual reconstruction steps and reduction of data volume, since virtually all diagnostic information is captured in 3D slices

Patient Registration

Direct input of patient information on the workplace immediately prior to scan

Pre-registration of patients at any time prior to scan

Special emergency patient registration (allows examination without entering patient data before scanning)

Transfer of patient information from HIS/RIS via DICOM Get Worklist

IVR (Interleaved Volume Reconstruction)

IVR enables utilization of the measured data as effectively as possible. By using IVR, the system extracts the maximum amount of diagnostic information from measured data, thereby improving spatial sampling in z-direction, independent of pitch.

HD FOV[1]

Designed to enable visualization of the human body parts and skin line located outside of the 50 cm standard scan field of view up to the bore size, based on the algorithmic complement of missing detector

syngo System Security

Modern way of guarding against malware, viruses and malicious attacks, comprising a bundle of solutions:

- Provides functionality for user Management and flexible access control for patient data
- Improves IT security
- Avoids system breakdowns due to malware installations which results in higher system uptimes and reliability
- Reduces risk of unwanted software installations
- Supports local IT personel
- Improves system performance and robustness
- Improves security for the use of external storage devices

Standard System Software and Applications

syngo Archiving & Networking

Screen Recorder

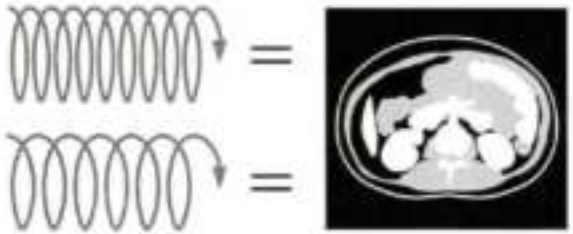
Integrated solution for imaging and visualization of 4D information, allowing the generation and editing of video files for improved diagnoses, recording, and teaching. A wide range of multimedia formats are supported, e.g., AVI, Flash (SWF), GIF, QuickTime (MOV), streaming video.

Image Transfer / Networking

- Interface for transfer of medical images and information using the DICOM standard. Facilitates communication with devices from different manufacturer.
- DICOM Storage (Send/Receive)
- DICOM Query/Retrieve
- DICOM Basic print
- DICOM Get Worklist (HIS/RIS)
- DICOM SR viewer
- DICOM Storage Commitment
- DICOM Viewer on CD/DVD
- DICOM MPPS

SureView: Siemens Healthineers' Patented Solution for Multislice CT Reconstruction

Pitch independent image quality



Sureview ensures that image quality is kept constant for all scan speeds, independent of the selected volume pitch.

There is higher pitch accuracy with settings available in steps of 0.1, simplifying processes by handling complex parameter settings.

Auto Field of View Adaption

When positioning the scan range, the width of the range is automatically adapted to cover the whole body of the patient.

CINE Display

Display of image sequences

Automatic or interactive with mouse control
Max. image rate: 30 frames/s

Standard GO Technologies

Scan&GO[1]

The operator can reduce walking time and potentially accelerate patient preparation and positioning with the Scan&GO tablet application. At the same time, they can stay close to the patient for most of the examination time.

Post the scan, the operator can preview images after the scan thanks to wireless image transfer to tablet. They can also finalize the exam and trigger pre-configured reconstruction tasks.

With the Scan&GO workflow, the operator can stay mobile and prepare the entire protocol next to the patient in time critical situations. They have the choice to leave the room only when triggering the radiation and spend the rest of the time with their patient.

Check&GO

Check&GO is an intelligent algorithm, based on big data, that monitors and flags problems with scan coverage, contrast distribution or the presence of wearable metal objects as they occur, for immediate action or correction. This allows you to correct issues on the go, avoid subsequent errors as well as stop the archival sub-optimal images.

Quality-control images are sent wirelessly to the tablet, so you can review them directly.

Check&GO detects the center and the radius of the arteries, based on different landmarks depending on the scanned body region the arterial enhancement is measured at relevant locations.

Standard GO Technologies

Recon&GO

Recon&GO enables the creation of Inline results, a set of fully automated advanced postprocessing applications as an alternative to the regular syngo.via algorithms.

This reduces postprocessing to zero-clicks with Recon&GO and its automatically corrected orientations.

Benefit from Recon&GO's standardized and consistent orientations, in typically challenging situations where patients can be mispositioned or uncooperative.

Recon&GO including

Multi-recon
Automatic generation of multiple series in different orientations (coronal / sagittal / axial) or image impressions (soft tissue / air / bone / ...)

Inline Anatomical Ranges
Automatic generation of radial and parallel ranges in any anatomical orientation and thickness. This automation saves time by avoiding manual workflow steps. Just configure your required results once and Recon&GO will always create them like a conventional reconstruction.

Inline Table and Bone Removal
Zero-click bone-free VRT reconstruction that facilitates a precise vascular assessment by visualizing blood vessels without interfering anatomical structures

Inline Vessel Ranges
Zero-click vessel centerline extraction and anatomical labeling of the main vessels (aorta, run-offs and carotids) with display of Curved Planar Reconstruction to simplify reporting of findings and stenosis assessment

Standard GO Technologies

CT View&GO

This viewing application available at the AWP provides you with intuitive and customizable cross-specialty tools for 3D visualization, filming and printing, as well as several post processing applications.

Customizable user interface, through a Favorite Toolbox

Automatic distribution and filming of images and results

Window width and center freely selectable

Single window

Multiple window settings for multi-image display

Organ-specific window settings, e.g., for soft tissue and bones

Image zoom and pan

Evaluation Tools @ CT View&GO

Parallel evaluation of more than 10 Regions of Interest
- Circle
- Irregular
- Polygonal

Statistical evaluation
- Area / volume
- Standard deviation
- Mean value
- Min. / max. values

Profile cuts
- Horizontal
- Vertical
- Oblique

Distance measurement

Angle measurement

Online measurement of a 5 x 5 pixel size ROI

Freely selectable positioning of coordinate system

Crosshair

Image annotation and labeling

Filming and Printing @ CT View&GO

Filming
- Digital film documentation, connection to a suitable digital camera
- Connection via DICOM Basic print
- Automatic filming
- Interactive virtual film sheet
- Customizable film formats with up to 64 images
- Filming parallel to other activities
- Independent scanning and documentation

Standard GO Technologies

3D Visualization @ CT View&GO

Real-time MPR
- Real-time multiplanar reformatting of secondary views
- Variable slice thickness (MPR thick, MPR thin) and distance with configurable default values
- Viewing perspectives
  - Sagittal
  - Coronal
  - Oblique
  - Double oblique
  - Freehand (curvilinear)

MIP and minIP
- MIP: Maximum Intensity Projection
- MinIP: Minimum Intensity Projection
- Thin MIP function for projection within a small slab to focus on particular vascular structure

***syngo* VRT (Volume Rendering Technique)**
Advanced 3D application package for the optimal display and differentiation of different organs through independent control of color, opacity, and shading

Postprocessing applications @ CT View&GO

Table and Bone Removal
Fast accurate presentation of subtracted CT Angiographic data sets

Vessel Extension
- Set of tools and layouts for guided creation of CPR (Curved Planar Reconstructions) for enhanced vascular assessment
- Comprehensive length and diameter measurements

Spine Ranges
- Guided reconstructions of anatomically aligned spine Curved Planar Reconstructions (CPR)
- Automatic detection and labeling of vertebrae

Endoscopic View
Virtual Endoscopy software enabling visualization of airways and intestines

Diameter/WHO area
Longitudinal lesion measurements and WHO for enhanced clinical decisions in oncology

ROI HU Threshold
Evaluation and display of tissue densities within a certain HU range

Lung Lesion Segmentation
The Lung Lesion Segmentation tool in CT View&GO performs an automated segmentation of solid and subsolid lesions in lungs, providing the volume and diameter according to the LungRADS guidelines.

Standard FAST Applications

FAST Planning @ AWP

FAST Planning is an AI machine learning powered set of algorithms that allow fast, organ-based setting of scan and reconstruction ranges. This enables consistent and reproducible acquisitions in Single and Dual Energy scans. By automating the workflow, users increase efficiency due to reduced manual steps and effort in scan preparation.

This Machine learning algorithm is trained with several hundreds of patient datasets in order to overcome even the most challenging anatomies (e.g., bypass). Landmark detection technology recognizes known "human anatomy anchors" on the topogram and the scan range automatically snaps to the correct region.

It prevents the range from being set too short or too long, so no parts of the organ are cut off or over-radiated.

FAST Planning @ Scan&GO tablet

In addition to the Acquisition Workplace (AWP), FAST Planning is also part of the Mobile Workflow as it is integrated in the Scan&GO tablet user interface including all described features above.

FAST Contact[1]

FAST Contact is an easy way to contact our service experts directly from the scanner console for technical and clinical application support. teamplay Fleet – our fleet management tool – also tracks and archives service tickets generated with FAST Contact.

FAST ROI

Optional FAST Applications

FAST 3D Camera

The AI-powered FAST 3D Camera enables an automated workflow to safeguard precision and consistency in patient positioning – enabling high efficiency, increased image quality, and an optimized isocenter for an optimal dose, regardless of individual skills.

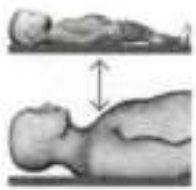
The algorithms of the FAST 3D Camera support accurate and reproducible positioning based on 3D image and infrared measurements, which even recognize body contours, for example, when people are wearing thicker clothes. The following specialized applications are included:

- FAST Isocentering, at the push of a button, provides the correct isocenter position, enabling the right dose modulation and consistent images.
- FAST Range supports scanning the correct body region with no cut-off – by aligning the automatically identified anatomical position with the protocol.
- FAST Direction helps safeguard the right scan direction, which is crucial when moving the table with infused patients.
- FAST Topo enables faster scan speeds in topograms, which prevents breathhold artifacts. It also has the potential to decrease the topogram dose.

The smart communication between the tablet and the FAST 3D Camera helps reduce mistakes even with non-cooperative patients between planning and scanning the topogram, thanks to reactive algorithms that will adapt the topogram planning even if patients move.

Standard and Optional CARE Applications

CARE kV



CARE kV automatically tailors tube voltage according to patient size and clinical task.

Simplify processes by automatically aligning mAs with the kV setting.

With the selection of optimal kV level between 70 and 140 kV, CARE kV minimizes dose. It further simplifies the process by automatically aligning the tube current with the selected kV.

10 kV Steps

Adapt your kV selection more precisely to reduce radiation dose at maintained image quality for a broad range of patient sizes.

Benefit from patient-specific and user-independent selection of the optimal kV setting with CARE kV in 10 kV steps.

More patient-specific dose management thanks to finer kV selection in 10 kV steps for individual dose management.

CARE Child

CARE Child offers scan parameters to be adapted to even small patient sizes. Dedicated pediatric protocols automatically set a low tube voltage – in most cases 70 kV – while CARE Dose4D optimizes dose distribution and offers special modulation curves.

CARE Bolus CT

Scan mode for contrast bolus triggered data acquisition

The procedure is based on repetitive low dose monitoring scans at one slice level and analysis of the time density curve in an ROI (Region of Interest).

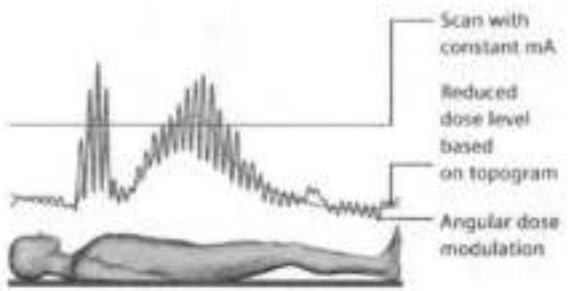
CARE Bolus CT allows the planning and the execution of contrast workflows within the Scan&GO user interface.

CARE Topo

Real-time topogram

Manual interruption possible once desired anatomy has been imaged

CARE Dose4D



Fully automated dose modulation solution. The algorithm automatically modulates tube current for optimum image quality.

This results in deduced dose levels, depending on patient size and anatomy, i.e. there is automatic patient- and organ-specific tube current adaption.

X-CARE

Standard and Optional CARE Applications

Protocol Password Protection

Prevent unauthorized access to scan protocols and avoid unauthorized modifications.

DICOM SR Dose Reports

DICOM structured file allows for the extraction of dose values ($CTDI_{vol}$, DLP) to create transparency and document dose values.

DoseLogs

Whenever the set reference dose levels are exceeded automatically a report is created on the system. The report can for example be used for audit purposes.

Dose Notification

The software checks the dose values per chronicle entry. May help to protect from over-radiation and warn the operator in case set dose thresholds are exceeded.

Dose Alerts

The software checks the accumulated dose per z-position. May help to protect from over-radiation and warn the operator in case set dose thresholds are exceeded.

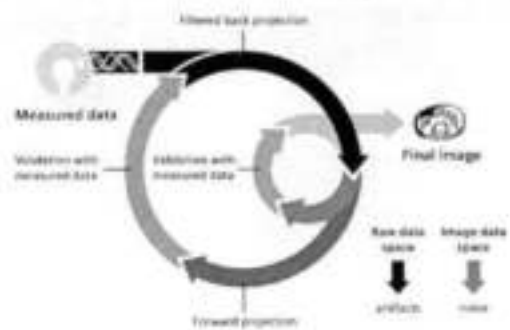
CARE Contrast[1]

CARE Contrast increases process efficiency and standardizes quality of care with technology that lets you synchronize and manage CT scan and contrast media injection, with the interchange of contrast injection protocols (including parameters like phase, flow, duration, volume).

Define and manage contrast media protocols on the scanner console.

Combined scan and contrast media protocols

SAFIRE (Sinogram Affirmed Iterative Reconstruction)

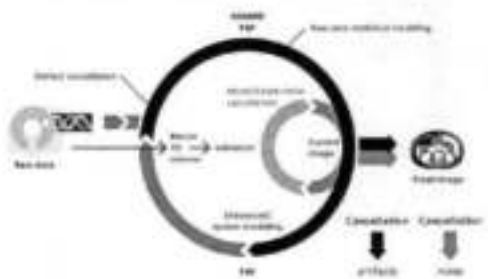


Equipped with SAFIRE, a model-based iterative reconstruction, SOMATOM go. scanners achieve up to 60% dose reduction while maintaining image quality and detail visualization combined with fast image reconstruction[2]. By this, equivalent results can be achieved at less dose, filling up the heat storage of the system more slowly and therefore, additionally, increasing the heat storage capacity.

The comprehensive iterative reconstruction method SAFIRE brings real model-based raw data based iterative reconstruction to the SOMATOM go. Dose reduction with CT has been limited by the currently used filtered back projection (FBP) reconstruction algorithm. When using this conventional reconstruction of acquired raw data into image data, a trade-off between spatial resolution and image noise has to be considered. Higher spatial resolution increases the ability to see small details; however, it is directly correlated with increased image noise in standard filtered back projection reconstructions as they are used in CT scanners today.

Standard and Optional CARE Applications

ADMIRE (Advanced Modeled Iterative Reconstruction)[1,2]



With ADMIRE – Siemens Healthineers' Advanced Modeled Iterative Reconstruction – clinical images additionally benefit from higher resolution at organ borders and improved edge delineation. As demonstrated using SOMATOM Force CT data, ADMIRE may simultaneously enable[2]

- 80% to 85% dose reduction at the same image quality, and
- 73% to 77% image noise reduction at the reduced dose, and
- up to 42% improved high-contrast spatial resolution at reduced dose and reduced image noise compared to images reconstructed with WFBP[3].

Alternatively, ADMIRE may enable[2]

- up to 150% improved low-contrast detectability (factor 2.5) at the same dose, or
- up to 90% image noise reduction at a constant dose, or
- up to 87% improved high-contrast spatial resolution at 85% reduced dose and constant image noise, or
- up to 38% improved high-contrast resolution at 90% reduced image noise and constant dose.

Flex Dose Profile

For long scan ranges, Flex Dose Profile works in combination with CARE Dose4D and FAST Planning to allow a more optimal modulation of the dose. In longer scans, some organs require more dose than the rest of the scan, i.e. there are different target dose levels needed for different anatomical regions, e.g. in regular thoracoabdominal examinations or in chest pain or TAVI procedures. FAST Planning automatically detects individual patient landmarks and anatomies, while Flex Dose Profile adjusts the tube currents for more personalized and accurate dose handling. Flex Dose Profile is displayed on the AWP and the Scan&GO tablet with the same visual logic as any other procedure, so users of any level of experience can utilize it right away.

Optional High Performance Package

Benefit from additional operational and clinical flexibility by configuring your SOMATOM go.Top with the High Performance package, a bundle of software and hardware options to boost your performance.

High Power 70 & 80

High Power 70 and the Athlon X-ray tube allow you to scan at 70 kV with the highest tube current of this CT class, up to 825 mA.

Scanning with low kV has the potential to lower the dose, improve image impression and reduce contrast media. Using less contrast media can reduce expenses for the hospital.

As demonstrated by phantom tests, the contrast of iodine achieved by scanning with low kV is higher than with other tube voltages. Image contrast is based on the mass attenuation coefficient. For lower photon energies, the mass attenuation coefficient of iodine increases, whereas soft tissue is less energy dependent. This means that the iodine-to-soft-tissue contrast in the CT image will increase at low-kV imaging and lower average photon energy. Publications have also shown a positive impact on contrast-enhanced studies.

High-speed 0.33 s

This option provides a rotation speed of down to 0.33 sec per rotation, for very high scan speeds. Fast gantry rotation times are the prerequisite for highest temporal resolution and are therefore essential for motion free cardiovascular imaging. With the temporal resolution of 165 ms, this CT is especially suitable for cardiac examinations and fast scanning.

CARE Contrast

CARE Contrast increases process efficiency and standardizes quality of care with technology that lets

Transfer contrast media protocol to patient protocol.

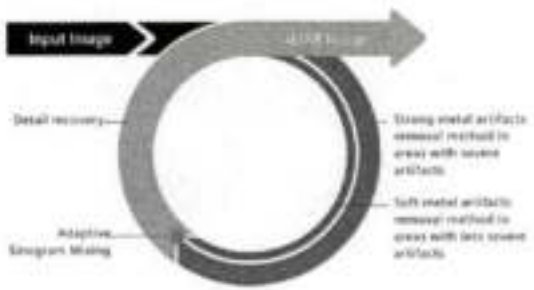
Selected pre-defined factory protocols[1] including quantified parameterization of flow and concentration for the contrast media, calculated for the average patient.

Basic Cardio Package

The SOMATOM go.Top with the High Performance Package is equipped with the basic cardio package boosted by myExam Compass. Based on patient characteristics such as e.g. heart rate and variability, myExam Compass suggests the most appropriate combination of acquisition and reconstruction parameters. Furthermore, it includes the adaptive Cardio Spiral and a new specific reconstruction kernel which enables Agatston equivalent scores even at lower kV settings. Together with the known GO Technologies this makes more advanced procedures like coronary CTAs easy. With real time feedback of ECG signal and electrode placement quality at the tablet, Scan&GO enables you to plan your entire scan close to the patient and also train the crucial breathing commands. Check&GO automatically checks for any removable metal, the correct organ coverage and contrast media distribution in real time. And Recon&GO inline CaScoring and syngo.CT Calcium Scoring provide you with total and relative Calcium Scoring including Coronary Age calculation – allowing you to include calcium scoring in every cardiac scan with almost no impact on workflow. The adaptive retrospective ECG-gated CT cardio spiral obtains CT images of the heart in defined phases of the cardiac cycle and let's you react flexibly to arrhythmia. Retrospective ECG gating also allows functional imaging of the heart and can be combined with ECG pulsing, reducing the dose beyond the regular dose plateau by ECG-based dose modulation.

Optional High Performance Package

iMAR



iMAR (iterative Metal Artifact Reduction) reduces metal artifacts for better image quality with no increase in dose.

The high-end algorithm can handle a wide variety of metal implants. By reducing metal artifacts, it improves visualization of soft tissue. It even allows you to address more challenging cases, such as those involving dental fillings, coils, implants, and pacemakers. Since metal can often be an issue in trauma cases, our iMAR algorithm is a key advantage for this clinical field too.

Diagnostic value can be further strengthened with the combination of iMAR with iterative reconstruction to further reduce dose. A strong imaging combination which is smoothly integrated into your daily orthopedic workflow. Reduce metal artifacts for higher image quality in trauma situations with iMAR.

iMAR is designed to yield images with a reduced level of metal artifacts compared to conventional reconstruction if the underlying CT data is distorted by metal being present in the scanned object. The exact amount of metal artifact reduction and the corresponding improvement in image quality achievable depends on a number of factors, including

Recon&GO

Inline Spine Ranges

Zero-click reconstruction of anatomically aligned spine reconstructions. The software detects and labels vertebrae within a predetermined scan area, and calculates their position for anatomically correct image reconstructions.

Inline Radial and Parallel Rib Ranges

- Zero-click reconstruction of radial and parallel rib specific visualization that adapts the rib cage anatomy displaying all ribs spread out in one plane
- Automated rib labelling and numbering

Inline CaScoring

For the first time, Inline CaScoring makes the Calcium Score available as zero-click reconstruction. With the known functionality of Recon&GO, Inline CaScoring calculates automatically the total Agatston Score as well as the Coronary Age (based on trial data) and archives them directly in the PACS. Results can be opened in *syngo*.CT CaScoring directly at the AWP and further processed if needed.

Optional System Software and Packages

Neuro Imaging

Flex 4D Spiral – Neuro[1]

- Continuously repeated bi-directional table movement during spiral acquisition enables an extended range for 4D information
- Facilitates volume perfusion studies in head applications for a perfusion range of up to 8.5 cm covering the entire supratentorial brain
- Facilitates dynamic angiographies for head and neck with a coverage of up to 26.5 cm
- These dynamic procedures are handled at the AWP with the same visual logic as any other procedures, so users of any level of experience can perform them right away

Recon&GO Inline ASPECTS

Inline ASPECTS automatically calculates the ASPECT score of a non-contrast CT head scan and highlights the affected brain regions as an overlay on the CT image. The images and results are automatically calculated in the background and can be directly sent to PACS without any user interaction. This makes Inline ASPECTS routine ready by providing consistent results independent of the user and always available especially in urgent situations when time is a scarce resource.

Neuro Package

The Neuro Package of your SOMATOM go.Top provides you with tools for the full stroke assessment

- Neuro DSA (Digital Subtraction Angiography) @CT View&GO for bone-free evaluation of the neuro vasculature
- syngo.CT Neuro Perfusion for dynamic 4D quantification and visualization of perfusion data

In addition, Recon&GO automatically produces standardized orientations to overcome challenging situations where patients might be wrongly positioned or unable to cooperate.

Neuro DSA @ CT View&GO
The Neuro DSA tool within CT View&GO provides a bone-free view of the cerebral vasculature based on the subtraction of an additional non-enhanced CT (NECT) scan that is three-dimensionally registered to the CTA data set.

Optional System Software and Packages

4D Imaging

Flex 4D Spiral – Body[1]

- Continuously repeated bi-directional table movement during spiral acquisition enables an extended range for 4D information.
- Facilitates volume perfusion studies in body applications for a perfusion range of up to 18.5 cm
- Facilitates dynamic studies up to a scan range of 40 cm
- These dynamic procedures are handled on the AWP with the same visual logic as any other procedure, so users of any level of experience can perform them right away

Cardio Imaging

Advanced Cardio Package[2]

The Advanced Cardio Package allows for comprehensive cardiac assessment. Optimized, fully tablet-operated scan preparation, fast scanning, and standardized results enabled by the integrated GO technologies allow you to devote more time to your patient.

It features:

- Adaptive Cardio Sequence for even more dose conscious cardiac scanning
- Bi-segment Cardio Spiral for improving temporal resolution in case of higher heart rates
- Inline cardio ranges with zero-click CPR creation, inline Heart Isolation and inline Coronary Tree with Recon&GO
- Intuitive and straightforward reading of challenging cases with the Cardio Ranges functionality at the CT View&GO

Optional System Software and Hardware for CT-guided Interventions

myNeedle Companion for CT-guided interventions

myNeedle Companion is the first Siemens Healthineers solution that harmonizes planning and guidance for percutaneous needle procedures across modalities. myNeedle Companion supports the interventionalist by utilizing the standard system tablet to interact with the system software and the images with touch-gestures from inside the examination room to stay close to the patient during a procedure. In addition the intervention user interface myNeedle Guide is displayed on a 24" or 32" in-room monitor[1] either mounted at the ceiling or on a cart. On the SOMATOM go.Top myNeedle Companion features:

myNeedle Guide 2D

Assists you in planning and guiding the needle during in-plane percutaneous CT-guided interventions. Dedicated tools support the planning of a needle path by providing distance and angle measurements from the target to the needle entry point in one or several axial CT slices. It includes i-Sequence scan mode referred to as FAST i-Sequence as it allows for quick scan repetitions, e.g. for dynamic monitoring of the needle.

myNeedle Guide 3D[2,3]

Supports all kind of percutaneous procedures, from simple in-plane interventions, to complex, double-angulated procedures. myNeedle Guide 3D supports planning of multiple needle paths by measuring distances and angles from the target to the needle entry point on one or several axial CT slices and as well on Multi Planar Reconstructions.

It includes:

- i-Sequence scan mode referred to as FAST i-Sequence as it allows for quick scan repetitions,

i-Fluoro[1,2]

Allows for real-time CT fluoroscopic image guidance. The scan mode i-Fluoro CT is completely integrated in the interventional workflow of myNeedle Guide. i-Fluoro lets you scan continuously, and view images in real time at up to 10 frames/s on an additional in-room monitor and as well on the second control room monitor. The acquired images have an image matrix of 512 x 512.

HandCARE

For i-Fluoro scans HandCARE can be applied enabling real-time dose modulation to avoid direct X-ray exposure to the physician's hands. HandCARE switches off the x-ray exposure for a 100° angle between three user selectable positions (10:00, 12:00 and 2:00 o'clock).

X-Ray Footswitch

Footswitch for triggering scans from the examination room

i-Joystick

The i-Joystick supports the table movement in z-direction (in and out of the gantry) directly from the table side. The i-Joystick can be flexibly mounted along both sides of the table designed for an ergonomic set-up during CT-guided minimal invasive procedures. It is connected via cable and can be mounted on both sides of the CT-table.

Tablet dock for patient table

The tablet dock for the patient table is fully adjustable for an ergonomic independent in-room operation during minimal invasive procedures. Optionally the table dock can be plugged in for an uninterrupted power supply for long interventions.

Optional System Software and Packages

Precision Matrix[1]

Reconstructions of images with matrix sizes of up to 1024 x 1024 and 768 x 768, useful to keep spatial resolution high even at full scan FOV

Powered by myExam Companion, the right image matrix size for axial and 3D reconstructions is automatically selected depending on FOV offering a balance between storage demand, reconstruction time and spatial resolution.

Lung CAD Package

Recon&GO

Inline Lung CAD
- Zero-click Lung CAD (Computer Aided Detection) series reconstruction, designed as second reader tool to assist radiologists in the detection of pulmonary nodules during review of CT examinations of the chest
- Designed to assist in the detection of solid pulmonary nodules

CT View&GO

- Lung CAD (Computer Aided Detection) is a fully automated, computer assisted second reader tool, designed to assist radiologists in the detection of pulmonary nodules during review of CT examinations of the chest.
- Designed to assist in the detection of solid pulmonary nodules

CT Dental

syngo.CT Dental

Allows reformatting panoramic views and paraxial slices through the upper and lower jaw, and enables

CT Osteo

CT View&GO

Non-invasive measurement of the bone mineral density of the lumbar spine to help early diagnosis of osteopenia and osteoporosis, and to assess the effectiveness of treatment. Osteo CT measurements are standardized to the ESP Phantom (ESP: European Spine Phantom). Includes table mat and reference phantom for Osteo CT studies.

Emergency Imaging

This package includes dedicated CT View&GO and Recon&GO applications to speed up the workflow in emergency procedures.

Recon&GO

Inline Brain Hemorrhage
Automatic detection and PACS notification of suspected intracranial hemorrhage

Inline Skull Unfolding
Automatic curved MIP images of skull and brain surface to support detection of skull fractures and thin surface hematoma

Results can be automatically sent to PACS

CT View&GO

Trauma layouts
Predefined layouts are automatically loaded and filled with corresponding data for head, neck, thorax and abdomen and pelvis. Data from Skull Unfolding and Brain Hemorrhage is automatically displayed within the layouts.

Optional System Software and Packages

Spectral imaging with Dual Energy

By allowing you to characterize, highlight, and quantify different materials this produces rich diagnostic information that a conventional single source scan cannot deliver. It does this without dose penalty in comparison to a standard 120 kV scan, and even allows you to further minimize radiation with any of our existing dose-reduction technologies.

Dual Energy procedures are handled at the AWP or at the Scan&GO tablet with the same visual logic and automation as any other procedures, so users of any level of experience can perform them right away.

Specially useful for users less experienced with the DE technique, this holistic approach, powered by the new myExam Compass, suggests which DE settings are more appropriate for every patient based on the procedure and patient characteristics, finding the optimal combination of acquisition and reconstruction parameters for excellent image quality, standardized results and always the right dose.

TwinSpiral Dual Energy[1]

A new holistic solution for spectral imaging is introduced. The TwinSpiral scan mode offers the possibility to acquire two consecutive spiral data sets at different energies used for non-contrast scans and the two different kV levels with independent mAs modulation deliver a combination of both morphological and functional information within one examination.

The robustness of the spectral separation is a key factor for the quality of the final images. The spectral properties of the Tin Filter lead to better spectral separation and therefore, amongst other benefits, potentially results in better tissue characterization. Leverage the power of the Mobile Workflow with end-to-end Spectral imaging protocols running from the tablet. Now users of any level of experience can perform

CT View&GO – Dual Energy ROI
Basic evaluation of the behavior of different tissues at different energies as an indication of their atomic composition

TwinSpiral Spectral Viewing

TwinSpiral Spectral Viewing allows for comprehensive assessment of non-contrast Dual Energy acquisitions with the most common applications. No matter if you would like to do your postprocessing directly at the AWP or rather have it sent automatically to PACS by Recon&GO – it offers a solution for all clinical workflows.

Recon&GO – Inline DE results for Mixed and Monoenergetic Plus[2]
Standardize results by automatically generating Mixed and Monoenergetic Plus Inline results in any required orientation, thickness or keV level e.g. for metal artifact reduction.

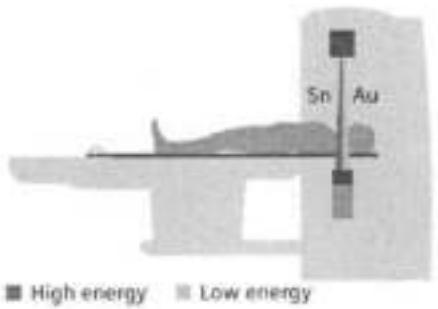
CT View&GO – Interactive Spectral Imaging for Mixed and Monoenergetic Plus[2]
- Start your postprocessing directly at the scanner within CT View&GO by the click of one button.
- Interact with Dual Energy information and select the energy level at which implants, clamps or screws have small impact on image quality.

syngo.CT Dual Energy – Advanced applications for AWP
Take advantage of advanced DE postprocessing directly at the scanner.
syngo.CT Dual Energy:
- Preparing and viewing of Dual Energy data
- Monoenergetic

syngo.CT DE Monoenergetic Plus[2]:
Compare lesions and tissues by displaying multiple ROIs and associated attenuation curves.

Optional System Software and Packages

TwinBeam Dual Energy



TwinBeam Dual Energy is an innovative, high-end approach that allows simultaneous acquisition of high and low kV spectra in a single spiral scan mode – with no dose penalty.

All dose reduction technologies such as CARE kV, CARE Dose4D and iterative reconstruction apply. Additionally, further dose may be saved with the elimination of non-contrast scans.

To create two X-ray spectra (high and low) simultaneously from one tube, the powerful Athlon tube assembly generates a prefiltered X-ray beam before it reaches the patient. Spectral separation is achieved with the integrated gold and tin filter.

Image acquisition is possible for all rotation times. High and low energy image series are reconstructed separately. Composed reconstruction delivers a single energy image dataset using the full information by directly combining the low and high energy data from the detector. With the full number of projections available for both spectra, there is no compromise on image quality.

TwinBeam Spectral Viewing[1]

Recon&GO – Inline DE results for Virtual Unenhanced (incl. iodine map)/Liver VNC/Fat map
Standardize results by automatically generating non-contrast images optimized for the respective organ tissue, iodine maps and fat maps and use Monoenergtic Plus also for further contrast enhancement.

CT View&GO – Interactive Spectral Imaging for Virtual Unenhanced (incl. iodine map)/Liver VNC/Fat map
- Expand the interaction with Dual Energy information to contrast media enhanced scans
- Toggle easily between different postprocessing visualizations and answer your clinical questions in just one work flow directly at the scanner

***syngo*.CT Dual Energy – Advanced applications for AWP**
Take advantage of advanced DE postprocessing directly at the scanner.
syngo.CT Dual Energy:
- Mixed image calculation
- Optimum Contrast

syngo.CT DE Virtual Unenhanced:
- Iodine uptake quantification
- Calculation of virtual unenhanced images (incl. Liver VNC)
- Calculation of fat map in the liver

Recon&GO – Spectral Recon[2]

- Benefit from the speed of Spectral Imaging reconstructions calculated directly at the IRS based on the spectral information available in the raw data, while reducing the amount of data and transfer times to PACS.
- Handle Spectral Imaging results seamlessly, evaluate and manipulate these volumetric data in

Optional System Software and Packages

Dual Energy Gout

Conventional methods of diagnosing gout, e.g. the aspiration of the joint are limited to feasibility especially in acute cases where the joint is inflamed and painful. In these cases an aspiration may not be performable. Amongst this gout can be difficult to diagnose, as there are various forms of arthritis that have similar symptoms.

Dual Energy Gout is overcoming these limitations allowing you visualize deposits of uric-acid crystals in peripheral extremities or periarticular soft tissue (e.g. tendons and ligaments) non-invasively – even in areas that cannot be reached with a conventional aspiration using:

- Zero-click PACS ready Recon&GO DE Gout
- Advanced syngo.CT DE Gout application directly at the AWP

Dual Energy Calculi Characterization

Identify and characterize different kinds of kidney stones with Dual Energy Calculi Characterization. Visualize and characterize kidney stones using:

- Zero-click PACS ready Recon&GO DE Calculi Characterization
- Advanced syngo.CT DE Calculi Characterization application directly at the AWP

Dual Energy Brain Hemorrhage[1,2]

Dual Energy Brain Hemorrhage helps to distinguish between contrast agent and hemorrhage lesions show significant iodine uptake, while hemorrhages do not enhance and are only visible in the virtual non-contrast image.

- Zero-click PACS ready Recon&GO DE Brain Hemorrhage
- Advanced syngo.CT DE Brain Hemorrhage application directly at the AWP

Dual Energy Bone Marrow[1]

Bone marrow can be affected by various pathologies, such as bone bruises after trauma and diffuse tumor infiltrations. Dual Energy Bone Marrow allows for the segmentation and color-coded visualization of bone marrow based on a material decomposition into bone marrow and calcium and by that helps to visualize e.g. edema.

- Zero-click PACS ready Recon&GO DE Bone Marrow
- Advanced syngo.CT DE Bone Marrow application directly at the AWP

Dual Energy Direct Angio[1]

Use Dual Energy to provide a bone free view of the vessel system on CT angiography (CTA) datasets by suppressing bone structures, e.g. at the base of the skull where CTA's can be difficult to interpret. Furthermore, it enables the visualization and evaluation of vessel stenosis or occlusion.

- Zero-click PACS ready Recon&GO DE Direct Angio
- Advanced syngo.CT DE Direct Angio application directly at the AWP

Dual Energy Lung Analysis[1]

Broaden your Dual Energy assessment and use the help of dedicated applications to detect pulmonary embolism and its related lung perfusion defects with:

- Zero-click PACS ready Recon&GO DE Lung Analysis
- Advanced syngo.CT DE Lung Analysis application directly at the AWP

Dual Energy Rho/Z[1]

One factor for the attenuation of X-rays is the electron density and the effective atomic number. Obtain the chemical characterization of different materials by:

- Zero-click PACS ready Recon&GO DE Rho/Z
- Advanced syngo.CT DE Rho/Z application directly

Fleet Management Applications

Shui® – the Siemens Healthineers Design System

Shui® is the new framework for all digital user interfaces in the Siemens Healthineers product and service portfolio, creating a coherent brand perception and user experience while making it easy to learn how to use, operate, and switch between multiple modalities.

teamplay performance management applications

teamplay applications for performance management in healthcare help you make quick and well-informed decisions by offering a clear overview of your clinical and operational performance data. The set of teamplay performance management applications gives you instant, centralized access to operational, technical and clinical data to help you optimize your operations and to deliver higher quality of care. Smart connections between the applications amplify the data insights and provide a seamless user experience.

teamplay Dose
teamplay Dose is an enterprise-wide radiation dose management solution providing you with easy access to dose data, supporting the quality assurance process

teamplay Usage
teamplay Usage provides you with a transparent view of your radiology department as well as in-depth insights into workflow and clinical processes. Our vendor neutral[1] solution displays key performance indicators (KPIs) for imaging device utilization. Smart filter settings support you in locating the data of interest. Patient change time, exam duration, and table occupancy are performance indicators that help you to understand your workflow and increase efficiency. Figures such as "exams per patient" or "total patients" can give you an insight into the financial side of your department.

teamplay Protocols
Identify best-practice scan protocols for imaging devices and use them for the optimization of your radiology workflow with teamplay Protocols[2]. Keep track of recent protocol changes and improvements – simply explore the version history of your protocols and add annotations for later reference. View all deviations from all your CT scan protocols at a glance – even across scanners or institutions. Save time and resources in your fleet network by distributing protocols remotely to compatible scanners.[2]

teamplay Insights[1]
With teamplay Insights, you get broad access to your radiology department data to discover insights you could not have found before. Build highly flexible, personalized, and interactive data visualization boards for both a monitoring view of your radiology department as well as for a deep dive analysis in specific use cases. Create trackers to check and report whether you will reach your set goals. Analyze and better understand numbers of no-shows and requirement patterns for priority cases. Take deep dives into your dose data to help better understand reasons

Radiation Therapy System Software and Hardware

HD FOV

Designed to enable visualization of the human body parts and skin line located outside of the 50 cm scan field of view up to the bore size, based on an algorithmic complement of missing detector data outside of the 50 cm scan FOV.

The image quality for the area outside the 50 cm scan field of view does not meet the image quality of the area inside the 50 cm scan field of view. Image artefacts may appear, depending on the patient setup and anatomy scanned. HD FOV cannot be used for scan FOV smaller than 50 cm.

Radiation Therapy Basic[1]

Radiation Therapy Basic is a dedicated virtual simulation tool designed for RT available under the CT View&GO platform. Contain Sim&GO.

General features

- Concurrent display of up to a total of 2 image series (1 single or 1 fused series)
- Data pre-fetching from DICOM nodes and imaging devices, simple import from CDs and DVDs, patient data reconciliation
- Image preview function
- Drag&Drop image loading
- Automatic data transfer to TPS configuration
- DICOM, HL7 and IHE-RO standard compliance
- Create annotations and measurements and share them

Patient Marking

- Single or multiple reference points or isocenters
- Absolute and relative patient marking
- Automatic marking of structure centroids
- Direct Laser Steering for compatible lasers[2]
- DICOM and text file data exchange with lasers

Contouring Features

- User configurable organ templates based on a subset of the FMA (Foundation Model of Anatomy) for interoperability between IT systems
- Parallel contouring: contouring performed on any image is reflected on all other images
- Semi-automatic freehand contouring 2D, 3D
- Smart 2D/3D Nudge
- Contour on any arbitrary plane including oblique planes
- Organ algebra (union, intersection, exclusion)
- Symmetric and asymmetric structure growth or contraction
- Multiple structure set support (1 per image series)
- Molecular imaging data such as PET, thresholdbased and skin, gray value-based segmentation
- Visualization of previously drawn structures on the current image series

4D data management

- 4D phase splitting
- tMinIP, tMIP, AverageCT generation
- Cine-loop
- ITV generation
- Quantitative assessment of 3D tumor trajectory and amplitude and semi-automatic calculation of the midventilation phase
- Control the patient marking workflow with the RT dedicated tablet and avoid unnecessary switching between different interfaces to enter laser coordinates.

Beam Placement

- Beam Placement including DRR, Source to Distance and beam templates
- Automated beam shaping based on RT structure

Radiation Therapy System Software and Hardware

DirectDensity[1,2]

DirectDensity images enable kV-independent dose calculation on the treatment planning system. Personalize your scan and benefit from a patient-specific kV selection with improved soft-tissue contrast while keeping a standardized workflow without the need for additional calibration curves.

RT table and overlay[1]

- 227 kg patient table RT with 227 kg multi-index RTP overlay
- Multi-indexing with Varian and Elekta indexing
- Light weight overlay
- TG-66 compliant

- 307 kg patient table RT with 307 kg multi-index RTP overlay
- Multi-indexing with Varian and Elekta indexing
- Light weight overlay
- TG-66 compliant

Respiratory Motion Management[1,2]

- Various acquisition modes and protocols accommodate for a wide range of respiratory patterns and workflows.
- Extended scan time capabilities up to 300 seconds
- Supports retrospective modes including phase and amplitude reconstructions
- Supports the automatic creation of temporal MinIP (tMinIP), temporal MaxIP (tMaxIP) and the easy generation via reconstruction of an Average CT, to evaluate respiratory motion
- Ability to automatically detect synchronization points
- User-selectable number and placement of reconstruction bins up to 1% recon
- Quantitative 4D assessment of 3D tumor trajectory

FAST 4D[1,2]

FAST 4D streamlines your 4D CT workflow by automatically setting the optimal scan parameters based on the patient's breathing rate. The direct online connection between the CT and a gating device over the Varian RGSC online interface or the ANZAI interface allows to display and analyze the breathing rate in real time.

Gating interfaces[1]

Varian RGSC interface
The online mode allows for retrospective gating

ANZAI interface
The online mode allows for retrospective gating

Open interface
For retrospective gating with a number of supported gating systems

Image Quality

Low-contrast Resolution

Low-contrast resolution is the ability to see ...

- a small object
- with a certain contrast difference
- on a particular phantom
- with a particular dose ($CTDI_{vol}$)

Phantom CATPHAN (20 cm)

Object size
5 mm

Contrast difference
3 HU

$CTDI_{vol}$ (32 cm)
10.75 mGy

Technique
1.0 s, 10 mm, 120 kV

Isotropic Resolution

Isotropic voxels using Siemens Healthineers' proprietary SureView technology

Isotropic resolution
0.33 mm

High-contrast Resolution

- 2% MTF 15.1 lp/cm (± 10%)
- 10% MTF 14.6 lp/cm (± 10%)
- 50% MTF 12.0 lp/cm (± 10%)

Technique

- Tungsten wire in air
- 160 mA, 120 kV, 1 s, 5 mm

Homogeneity

Cross-field uniformity in a 20 cm water phantom

- Max. ± 4 HU[1]
- Typ. ± 2 HU

Phantom positioned near center of rotation

Dose, $CTDI_{100}$ Values mGy/100 mAs

Phantom		kV	kV	kV	kV
Ø		70	80	110	140
16 cm	A	3.8	5.9	14.6	25.8
	B	4.3	6.4	15.3	26.6
32 cm	A	0.9	1.5	4.3	8.3
	B	2.2	3.3	8.5	15.3

A: at enter

B: 1 cm below surface

Technique

- PMMA-Phantom
- Absorbed dose for reference material air
- Expected deviation:
  ± 10% without Split Filter
  ± 20% with Split Filter
- Max. deviation:
  ± 20% without Split Filter
  ± 30% with Split Filter

The actual exposure values, such as $CTDI_{100}$, $CTDI_{vol}$, $CTDI_{vol}$, and DLP, may deviate from the values displayed at the scanner and from the values stated here.

The linearity of the radiation output (linearity of measured dose related to displayed mAs) is ± 10%

Installation

Components

Dimensions	Height (mm / inch)	Width (mm / inch)	Length (mm / inch)	Weight (kg / lbs)
Gantry	≤ 1,860 / 73.2	≤ 2,250 / 88.6	≤ 840 / 33.1	≤ 1,400 / 3,086
CT patient table (227 kg)	≤ 950 / 37.4	≤ 700 / 27.6	≤ 2,480 / 97.6	≤ 500 / 1,102
CT patient table (307 kg)[1]	≤ 950 / 37.4	≤ 700 / 27.6	≤ 2,560 / 100.8	≤ 500 / 1,102
RT patient table[1]	≤ 950 / 37.4	≤ 700 / 27.6	≤ 2,480 / 97.6	≤ 500 / 1,102

Power Supply

Nominal voltage ± 10%
380–480 V

Nominal line frequency ± 10%
50; 60 Hz

Power Consumption

Max. power consumption
- ≤ 115 kVA
- ≤ 100 kVA with Cos Phi Inductor[1]

Standby
≤ 3 kVA

Power Consumption according to COCIR and GPP

Use scenario 24-hour power consumption[4]

Off[2]
16.6 kWh

Low power[2]
17.5 kWh

Idle (stand-by)
32.4 kWh

Protection Against Input Power Instability

Sound Design

Standby
55 dB(A)

Peak
67 dB(A)

Electromagnetic Compatibility

This product is in compliance with IEC 60601-1-2 and fulfills CISPR 11 Class A.

Room Environment

Temperature range
18–30 °C / 64.4–86 °F

Relative air humidity without condensation
20–75%

Heat dissipation (gantry, table and integrated computers)
≤ 7.4 kW scanning

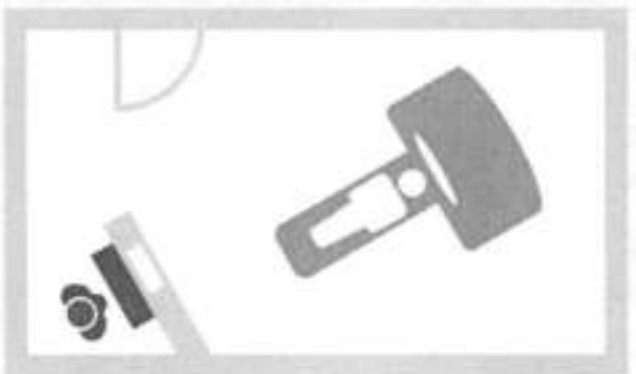
Surface Area for Installation[2]

System footprint (surface area covered by gantry and moving table top)
4 m² / 43 ft²

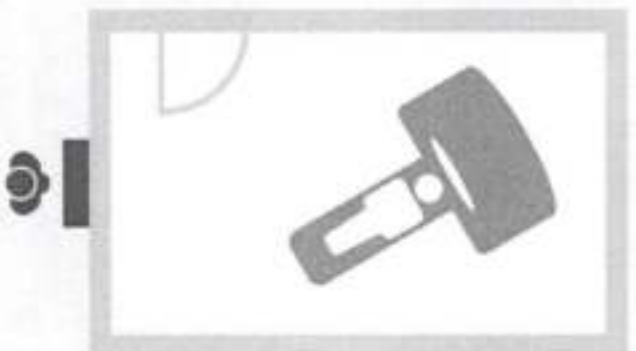
Flexible room design minimum requirement

Installation

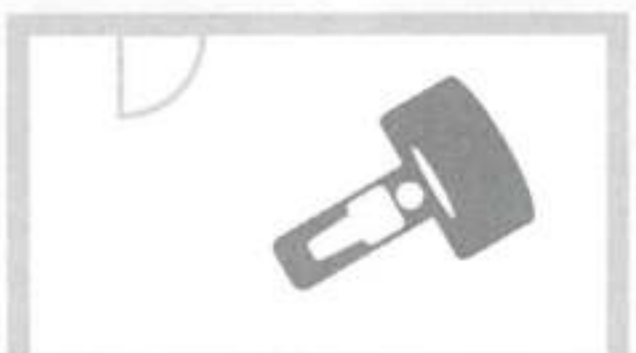
Flexible Room Concepts[1]



Follow the "niche" concept to work in the examination room.



Position the workstation outside the room, e.g., in the corridor.



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SIEMENS Healthineers

Siemens Healthcare GmbH, SHS EMEA DES 85, Karlheinz Kaske-Str. 5, 91052 Erlangen

Name Dr. Michael Klug
Department SHS EMEA DES 85

Telephone +49 (172) 6347870
E-mail emea_des_bs.team@siemens-healthineers.com
Our reference TZ2204
Date February 21, 2022

TENDER BOARD SECRETARY
MUHIMBILI NATIONAL HOSPITAL
P.O.BOX 65000
KALENGA STREET UPANGA
DAR ES SALAAM
TANZANIA

Reference | FT No. PA/009/2021-22/ HQ/G/06 LOT 15

MANUFACTURER'S AUTHORIZATION FORM

We, Siemens Healthcare GmbH ("Siemens Healthineers"), who are official manufacturer and manufacturer through affiliates of

- SOMATOM go.Top, SOMATOM go.All
- MAGNETOM Altea, MAGNETOM Sempra, MAGNETOM Free.Max
- Multix Impact, Multix Impact C
- ACUSON NX3, ACUSON NX3 Elite, ACUSON Juniper, ACUSON Redwood
- Artis zee
- Teamplay
- Syngo Virtual Cockpit

and manufacturer through contracted factory of

- Mobilett Elara Max

having its principal place of business at Henkestraße 127, 91052 Erlangen, Germany and having factories in Germany, China, Spain, Republic of Korea and USA, do hereby authorize:

PACIFIC DIAGNOSTICS LTD.
Plot 46-48, Mikocheni Light Industrial Area
Coca Cola Road
DAR ES SALAAM
PO BOX: 34056
UNITED REPUBLIC OF TANZANIA

to submit a bid in relation to the Invitation for Bids indicated above, the purpose of which is to provide the above Goods, manufactured by us, and to subsequently negotiate and sign the Contract, in its own name and on its own account.

SIEMENS Healthineers

We hereby extend our standard warranty with respect to the goods manufactured by us offered for supply by the above firm against this Invitation for Tenders.

Sincerely yours,

Siemens Healthcare GmbH

Carole Millet-Perry
Controlling Manager Direct Export Sales

Dr. Michael Klug
Head of Business Services Direct Export Sales

Siemens Healthcare GmbH
Henkestr. 127
Postfach 3260
91050 Erlangen
+49 (9131) 84-0

FORM OF TENDER AND PRICE SCHEDULES SUBMITTED BY THE CONTRACTOR

Pacific Diagnostics
medical imaging solutions

Plot 46- 48, Mikocheni Industrial Area, Opposite Coca-cola Kwanza Factory Dar es Salaam, Tanzania.
Email: info@pacificafrica.com, Tel:+255 22 2701032 Fax: +255 22 2773440

Form of Tender

Date: 21st February 2022

IFB No: PA/009/2021-22/ HQ/G/ 06 LOT 15

SUPPLY, INSTALL, TEST, TRAIN AND COMMISSION OF MEDICAL EQUIPMEMNTS

To:
TENDER BOARD SECRETARY,
MUHIMBILI NATIONAL HOSPITAL
P.O.BOX 65000
KALENGA STREET UPANGA
DAR ES SALAAM

Ladies and/or Gentlemen,

Having examined the Tendering documents, including Addendum Nos. NONE, the receipt of which is hereby acknowledged, we, the undersigned, offer to design, manufacture, test, deliver, install, pre-commission and commission the Facilities under the above-named Contract in full conformity with the said Tendering documents for the sum of: Tanzanian Shillings, Four Billion, TZS 4,000,000,000.00 or such other sums as may be determined in accordance with the terms and conditions of the Contract. The above amounts are in accordance with the Price Schedules attached herewith and are made part of this Tender.

We undertake, if our Tender is accepted, to commence the supply and installation of Facilities and to achieve Completion within the respective times stated in the Tendering documents.

If our Tender is accepted, we undertake to provide an advance payment security and a performance security in the form, in the amounts, and within the times specified in the Tendering documents.

We declare that our tendering price did not involve agreements with other tenderers for the purpose of tender suppression.

PACIFIC DIAGNOSTICS LTD

We are not participating, as tenderers, in more than one Tender in this tendering process other than alternative tenders in accordance with the tendering documents.

We hereby confirm Tanzania Institute Of Arbitrators, to be the Appointing Authority, to appoint the adjudicator in case of any arisen disputes in accordance with ITT 45.1

We agree to abide by this Tender, for a period of 120 days from the date fixed for submission of Tenders as stipulated in the Tendering documents, and it shall remain binding upon us and may be accepted by you at any time before the expiration of that period.

We declare that, as tenderer(s) we do not have conflict of interest with reference to ITT clause 3.7

Commissions or gratuities, if any, paid or to be paid by us to agents relating to this Tender, and to contract execution if we are awarded the contract, are listed below

Name and address of agent	Amount and Currency	Purpose of Commission or gratuity
NONE	NONE	NONE
(if none, state "none").		

Until a formal contract is prepared and signed between us, this Tender, together with your written acceptance thereof and your notification of award, shall constitute a binding contract between us.

We understand that you are not bound to accept the lowest or any Tender you may receive.

PACIFIC DIAGNOSTICS LTD

Dated this 21st day of February, 2022.

PACIFIC DIAGNOSTICS LIMITED
DAR-ES-SALAAM

[signature]

In the capacity of CHIEF OPERATING OFFICER

[position]

Duly authorized to sign this Tender for and on behalf of PACIFIC DIAGNOSTICS LIMITED.

[name of Tenderer]

Pacific Diagnostics

[illegible]
Dar es Salaam, Tanzania.
[illegible]
[illegible]

Muhimbili national Hospital
Schedules of Rates and Prices

QUOTE FOR 64 SLICE CT SCANNER MACHINE

TENDER No. PA/009/2021-22/HQ/G/06 LOT 15

S/N	Item Description	Model	Qty	Unit price TZS, DDP	Total Price
1	CT Scan 64 slices	SIEMENS Somatom GO TOP	2	2,000,000,000	4,000,000,000
	64 Slice CT Scan machine as specified in your requirements Somatom GO. TOP 64 slice CT system with 2 years warranty and 3 years comprehensive maintenance included	INCLUDED			
	Total Price for supply of 64 Slice CT scanner machine				4,000,000,000.00

Name NAFTAL PHILLIP in the capacity of CHIEF OPERATING OFFICER

Signature of Tenderer: ______________________

Duly authorized to sign the Tender for and on behalf of PACIFIC DIAGNOSTICS LIMITED

Dated on 21st day of February 2022

PACIFIC DIAGNOSTICS LIMITED
DAR-ES-SALAAM

Pacific Diagnostics

Plot 46-48, Mikocheni Industrial Area, Opposite Coca-cola Kwanza Factory
Dar es Salaam, Tanzania
Email: info@pacificafrica.com
Tel: [illegible] Fax: [illegible]

TENDER No. PA/009/2021-22/HQ/G/06 LOT 15

CMC VALUES FOR 5 YEARS

Item No.	Description of Goods		Qty	Unit Price	Total Price
				US DOLLARS	US DOLLARS
	CMC VALUES AFTER 5 years warranty for 64 Slice CT Scan machine. Price indicated is per machine				-
	6th year			88,000.00	-
	7th year			92,400.00	-
	8th year			92,400.00	-
	9th year			97,020.00	-
	10th year			97,020.00	-
	The above prices are on the assumption that there shall be no changes in Import Duty OR VAT on the cost of spare parts, or any addition to the current taxes and their levels as of Feb 2022.				
	The CMC Prices are subject to VAT. The same is to be added as per Government rate				-
	The payment may be made in equivalent TZS at the beginning of each year				-
					-

Signature of Tenderer: ____________________

Duly authorized to sign the Tender for and on behalf of PACIFIC DIAGNOSTICS LIMITED.
Dated on 21st day of February 2022

PACIFIC DIAGNOSTICS LIMITED
DAR-ES-SALAAM

Pacific Diagnostics

[illegible]

TENDER No. PA/009/2021-22/HQ/G/86 LOT 15

SITE PREPARATION PLAN

Item No.	Description of Goods		Qty.	Unit Price TZS
	SITE PREPARATION PLAN. Price indicated is per			
	Temeke RRH	[illegible]		196,000,000.00
	Tumbi RRH	Room needs renovation		151,287,900.00
	Prices indicated are VAT exclusive			

Name of Tenderer : PACIFIC DIAGNOSTICS LTD

Signature of tenderer:

PACIFIC DIAGNOSTICS LIMITED
DAR-ES-SALAAM

NEGOTIATION MINUTES

Form No. 14B

RECORD OF NEGOTIATION

Name of the Procuring Entity: Muhimbili National Hospital
Subject of Procurement: Supply, Install, Test, Train and Commission of Medical Equipments (CT SCAN machine for Tumbi RRH)
Tender No: PA/009/2021 - 2022/HQ/G/06 LOT 15
Date of Negotiation: 8th March, 2022

SN	Issue	Description	Before Negotiation	Negotiation Agreement
1	Negotiation on possible price reduction of the CT SCAN Machine	To discussing on price reduction of the CT SCAN machine.	The price needs further discussion for reaching a reasoble price with a win - win situation.	The Supplier agreed to reduce tender price from **TZS 2,000,000,000** to **TZS 1,850,000,000.** Amount saved is **TZS 150, 000,000.00** The estimated cost is **TZS 2,180,000,000** including construction cost. Therefore, the balance remained for construction is **TZS 330, 000,000.00**
2	Clarification on vertical table movement of 28.3mm/sec offered by the Bidder instead of 50mm/sec requested by PE.	The assurance of PE on vertical table movement of 28.3mm/sec offered if will meet the intended purpose.	Assurance of vertical table movement of 28.3 to perform the intended purpose.	Bidder clarified, and for technical point of view, all parties agreed that the vertical table movement of 28.3mm/sec offered by the Bidder is suitable and safe for all patients regarding their age and sex.
3	Clarification on 2 years manufacturer warranty, 5 years comprehensive maintenance service including spare parts offered by the Bidder. PE requested 2years manufacturer warrant and 3 years comprehensive maintenance services.	Need to understand if the added time in comprehensive maintenance service has a cost implication to PE.	Understanding if the added time in a comprehensive maintenance service has a cost implication to PE.	Bidder accepted to offer as per user requirements and there will be no extra cost to PE.

10

SN	Issue	Description	Before Negotiation	Negotiation Agreement
4	Clarification on certified comprehensive service training for the Biomedical Engineers at the PE site offered one week instead of 3 weeks requested by PE.	Need to understand why the bidder offered one week (1) training for biomedical engineers at manufacturer site instead of 3 weeks requested by PE.	It was not clearly known/stated why the bidder offered one (1) week training at the manufacturer site instead of 3 weeks requested by PE.	Both parties agreed that the training to biomedical engineers will be offered in three (3) weeks where; two (2) weeks training will be done to biomedical engineers at PE site and One week (1) at the manufacturer's site.
5	Clarification if PACS of at least 30T will be offered to PE.	PACS is required by PE	The need of PACS by PE.	Bidder accepted to offer as per PE request.
6	Payment plan	Discussing and agreeing on terms and modality of payment.	Agreement between two parties on payment terms was not clearly known.	Parties agreed on the following payment plan: i. Advance payment of 30% at the initial stage upon submission of payment claim and advance payment guarantee. ii. 60% on delivery at site (Tumbi RRH) upon submission of delivery documents. iii. The remaining 10% after installation, testing, training and commissioning of the machine. **NB** Apart from advance payment, the remaining 70% will be done through irrevocable letter of credit. Bidder will be liable for the Bank charges.

Form No. 14B

We hereby certify that the above is a true and accurate record of the negotiations:

For the Procuring Entity	**For the Tenderer/Supplier**
Signature: J.S.O.	Signature:
Name: KEBA MOHAMED.	Name: NAFIAL PHILIP
Position: RADIOGRAPHER. KEBA MOHAMED.	Position: C.O.O
Date: 08/03/2022.	Date: 08-March-2022

RECORD OF NEGOTIATIONS

Name of the Procuring Entity: MUHIMBILI NATIONAL HOSPITAL
Tender ID No.: PA/009/2021-22/HQ/G/06 LOT 15
Subject of Procurement: Supply, Install, Test, Train and Commission of Medical Equipments (CT scan Machine for Tumbi RRH)
Method of Procurement: Single Source Tendering

PART 2: RECORD OF ATTENDANCE AT NEGOTIATIONS

SN	Name	Position	Name of Tenderer /Firm/Organization	Signature
1	TIMOTHY SANDARA	PROCUREMENT	MUHIMBILI NATIONAL HOSPITAL	
2	DEOGRATIAS CHAGULA	MEDICAL - ENG	TUMBI - RRH	
3	MDJD K. MSEMO	RADIOGRAPHER	MNH	
4	KEBA MOHAMED	RADIOGRAPHER	TUMBI-RRH	
5	NAFTAL PHILIP	C.O.O	PACIFIC	
6	IKUPA MWASUMBI	Radiologist	Temeke RRH	
7				

POWER OF ATTORNEY

STANDARD POWER OF ATTORNEY

TO ALL IT MAY CONCERN

THAT BY THIS POWER OF ATTORNEY given on the 19th February 2022,
WE the undersigned PACIFIC DIAGNOSTICS LIMITED of Plot 46-48, Mikocheni Industrial Area, Coca-Cola road, P.O. Box 34056, Dar es Salaam, Tanzania , by virtue of authority conferred to us by the Board Resolution No of 2019, do hereby ordain nominate and appoint NAFTAL PHILLIP of P.O. Box 34056, Dar es Salaam, Tanzania to be our true lawful Attorney and Agent, with full power and authority, for us and in our names, and for our accounts and benefits, to do any, or all of the following acts, in the execution of tender No. **PA/009/2021-22/ HQ/G/06 LOT 15** that is to say;

> To act for the company and do any other thing or things incidental for **PA/009/2021-22/ HQ/G/06 LOT 15** of **SUPPLY, INSTALL, TEST, TRAIN AND COMMISSION OF MEDICAL EQUIPMEMNTS** for the **MUHIMBILI NATIONAL HOSPITAL;**

AND provided always that this Power of Attorney shall not revoke or in any manner affect any future power of attorney given to any other person or persons for such other power or powers shall remain and be of the same force and affect as if this deed has not been executed.
AND we hereby undertake to ratify everything, which our Attorney or any substitute or substitutes or agent or agents appointed by him under this power on his behalf herein before contained shall do or purport to do in virtue of this Power of Attorney.

SEALED with the common seal of the said PACIFIC DIAGNOSTICS LIMITED and delivered in the presence of us this 19th of February 2022

IN WITNESS whereof we have signed this deed on this 19th of February 2022 at Dar es Salaam for and on behalf of PACIFIC DIAGNOSTICS LIMITED

SEALED and **DELIVERED** by the
Common Seal of PACIFIC DIAGNOSTICS LIMITED
This 19th February 2022

.....
DONOR

BEFORE ME:

HELLEN A. MREMA
ADVOCATE
P. O. Box 7318
DAR-ES-SALAAM

.....
COMMISSIONER FOR OATHS

ACKNOWLEDGEMENT

I NAFTAL PHILLIP doth hereby acknowledge and accept to be Attorney of the said PACIFIC DIAGNOSTICS LIMITED under the terms and conditions contained in this POWER OF ATTORNEY and I promise to perform and discharge my duties as the lawfully appointed Attorney faithfully and honestly.

SIGNED AND DELIVERED by the said **NAFTAL PHILLIP,** Who is known to me personally This 19th February 2022

.....
DONEE

BEFORE ME

.....
COMMISSIONER FOR OATHS

HELLEN A. MREMA
ADVOCATE
P. O. Box 7318
DAR-ES-SALAAM

Appendix 1: Terms and Procedures of Payment

The following Terms and Procedures of Payment are given as a guideline suitable for Supply and Installation Contracts. In the event that the Employer wishes to introduce different terms of payment to the following, it shall first obtain the written approval of the Bank for the terms it intends to use. If additional Price Schedules are introduced, suitable terms of payment in respect of such additional schedules must be added.

In accordance with the provisions of GCC Clause 12 (Terms of Payment), the Employer shall pay the Contractor in the following manner and at the following times, on the basis of the Price Breakdown given in the section on Price Schedules. Payments will be made in the currencies quoted by the Tenderer unless otherwise agreed between the parties. Applications for payment in respect of part deliveries may be made by the Contractor as work proceeds.

TERMS OF PAYMENT

Schedule No. 1. Goods Supplied from Abroad

In respect of goods supplied from abroad, the following payments shall be made:

Ten percent (10%) of the total CIF or CIP amount as an advance payment against receipt of invoice and an irrevocable advance payment security for the equivalent amount made out in favor of the Employer. The advance payment security may be reduced in proportion to the value of the goods shipped FOB or delivered to the site, as evidenced by shipping and delivery documents.

Eighty percent (80%) of the total or pro rata FOB or FCA amount upon *Incoterm* "FOB" or "FCA," within forty-five (45) days after receipt of invoice and shipping documents. In the event that shipping is delayed upon the written instruction of the Employer for more than twenty-eight (28) days beyond the date shown in the Programme of Performance provided in accordance with GCC sub-Clause 18.2, the Contractor may make application for this part of the payment against warehouse receipts, provided always that the goods are ready for shipment on the date shown in the said Programme.

Eighty percent (80%) of the total or pro rata CIF or CIP amount upon *Incoterm* "CIF or "CIP," upon delivery to Site within forty-five (45) days after receipt of invoice, less eighty percent (80%) of the FOB amount already paid or authorized for payment.

Five percent (5%) of the total or pro rata CIF or CIP amount upon issue of the Completion Certificate, within forty-five (45) days after receipt of invoice.

Five percent (5%) of the total or pro rata CIF or CIP amount upon issue of the Operational Acceptance Certificate, within forty-five (45) days after receipt of invoice.

Schedule No. 2. Goods Supplied from within the United Republic of Tanzania

In respect of goods supplied from within the, United Republic of Tanzania the following payments shall be made:

Ten percent (10%) of the total EXW amount as an advance payment against receipt of invoice, and an irrevocable advance payment security for the equivalent amount made out in favor of the Employer. The advance payment security may be reduced in proportion to the value of the goods delivered to the site, as evidenced by shipping and delivery documents.

Eighty percent (80%) of the total or pro rata EXW amount upon *Incoterm* "Ex-Works," upon delivery to the site within forty-five (45) days after receipt of invoice.

Five percent (5%) of the total or pro rata EXW amount upon issue of the Completion Certificate, within forty-five (45) days after receipt of invoice.

Five percent (5%) of the total or pro rata EXW amount upon issue of the Operational Acceptance Certificate, within forty-five (45) days after receipt of invoice.

Schedule No. 3. Local Transportation

In respect of local transportation for both the foreign currency (where applicable) and the local currency portions, the following payments shall be made:

Ten percent (10%) of the total local transportation amount as an advance payment against receipt of invoice, and an irrevocable advance payment security for the equivalent amount made out in favor of the Employer. The advance payment security may be reduced in proportion to the value of the Goods delivered to the site, as evidenced by shipping and delivery documents.

Ninety percent (90%) of the total or pro rata local transportation amount upon delivery to the site within forty-five (45) days after receipt of invoice.

Schedule No. 4. Installation Services

In respect of installation services for both the foreign and local currency portions, the following payments shall be made:

Ten percent (10%) of the total installation services amount as an advance payment against receipt of invoice, and an irrevocable advance payment security for the equivalent amount made out in favor of the Employer. The advance payment security may be reduced in proportion to the value of work performed by the Contractor as evidenced by the invoices for installation services.

Eighty percent (80%) of the measured value of work performed by the Contractor, as identified in the said Programme of Performance, during the preceding month, as evidenced by the Employer's authorization of the Contractor's application, will be made monthly within forty-five (45) days after receipt of invoice.

Five percent (5%) of the total or pro rata value of installation services performed by the Contractor as evidenced by the Employer's authorization of the Contractor's monthly applications, upon issue of the Completion Certificate, within forty-five (45) days after receipt of invoice.

Five percent (5%) of the total or pro rata value of installation services performed by the Contractor as evidenced by the Employer's authorization of the Contractor's monthly applications, upon issue of the Operational Acceptance Certificate, within forty-five (45) days after receipt of invoice.

In the event that the Employer fails to make any payment on its respective due date, the Employer shall pay to the Contractor interest (On the rate of the Bank of Tanzania on the date of signing of the contract) on the amount of such delayed payment at the rate of 0.0001% per monthfor period of delay until payment has been made in full.

PAYMENT PROCEDURES

The procedures to be followed in applying for certification and making payments shall be as follows:

Appropriate procedures, normally through letters of credit, are to be inserted (including forms and certificates annexed as appropriate) by the Employer in the Tendering documents.