APPENDIX 3A

LOT 1 SPECIFICATION
COMPUTED TOMOGRAPHY (CT) SCANNERS AND ASSOCIATED OPTIONS AND RELATED SERVICES

1. Introduction

1.1. This Lot is for the supply of Computed Tomography (CT) scanner systems capable of fast sequential and helical scanning and reconstruction, producing high quality, essentially artefact-free images. Mobile systems suited to use in patient care areas, outside of a Radiology department and within an operating theatre are also required.

1.2. The core product lines within this Lot are as follows:

Line Number	
1	General CT scanner
2	Advanced CT scanner
3	Premium CT Scanner
4	Wide bore CT scanner for radiotherapy simulation
5	Mobile CT scanner for whole body studies
6	Mobile CT scanner for head and neck studies

1.3. All product line(s) must be supplied with a minimum 7 year expected lifecycle under proper use and maintenance.

2. Line 1 – General CT Scanner

2.1. This is the core specification for the supply, delivery, installation and commissioning of a 16 to 80 slice CT scanner system capable of fast sequential and helical scanning and reconstruction, producing high quality, essentially artefact-free images at dose levels which are as low as reasonably practicable.

2.2. The core components of a 16 to 80 slice CT scanner system:
- 2.2.1 CT gantry with X-Ray generator and X-Ray tube.
- 2.2.2 Patient table.
- 2.2.3 Image reconstruction computer.
- 2.2.4 User control terminal.
- 2.2.5 Ancillary equipment/Contrast injector connection.

2.3. CT gantry with X-Ray generator and X-Ray tube:
- 2.3.1 The X-Ray generator must have a minimum power of 32 kW.
- 2.3.2 The detector must have between 16 and 80 rows of slices.
- 2.3.3 The minimum image thickness must be <= 0.75 mm.
- 2.3.4 The minimum rotation time must be at least 0.8 seconds.

2.3.5 The CT system must include an automatic dose control system.
2.3.6 The gantry aperture must be at least 70 cm.
2.3.7 The gantry must include patient positioning lasers in both the PA and lateral planes.
2.3.8 The coincidence of the laser beam and scan plane must be <= 2 mm.
2.3.9 The kVp (peak Kilovoltage) range must be at least 80 to 135 kVp.
2.3.10 The X-Ray tube must have a heat capacity of at least 3.5 MHU.
2.3.11 The X-Ray tube must have a maximum cooling rate of at least 567 kHU/min.
2.3.12 The X-Ray tube must contain at least two automatically selectable focal spots.
2.3.13 The X-Ray tube must contain automatically selectable filtration based on selected field of view.
2.3.14 The maximum field of view must be at least 50 cm.
2.3.15 The CT system must be able to acquire 2D projection radiographic images for scan planning in both PA, AP and lateral projections.
2.3.16 It must be possible for SPR to be acquired of manually determined scan ranges of up to 1.5m.
2.3.17 Limiting high contrast spatial resolution, scan plane (lp/cm @10% modulation transfer function (MTF)) must be at least 13 lp/cm.
2.3.18 Limiting high contrast spatial resolution, scan plane (lp/cm @0% MTF) must be at least 15 lp/cm.
2.3.19 Deviation of the image thickness from nominal value in sequential and helical scanning must be less than 40% for nominal thickness < 0.625 mm.
2.3.20 Deviation of the image thickness from nominal value in sequential and helical scanning must be less than 30% for nominal thickness > 0.625 mm.
2.3.21 Low contrast resolution must be at least 2.5mm diameter @ 0.25% contrast in Catphan for maximum 25 mGy surface dose (32 cm diameter computed tomography dose index (CTDI) phantom).
2.3.22 The uniformity of CT numbers must be within 4 HU across a 25 cm diameter water filled phantom.

2.4. Patient table must meet the below requirements:
2.4.1 The total scannable range must be at least 1.5 metres.
2.4.2 The table positioning accuracy must be at least +/- 0.25 mm.
2.4.3 The table must lower to within 65 cm of the floor.
2.4.4 The maximum patient weight at specified table positioning accuracy must be at least 200 kg.

2.5. Image reconstruction computer:
2.5.1 The image reconstruction rate must be at least 8 images per second (512 x 512 matrix).
2.5.2 Raw data storage capacity must be at least 128 GB.
2.5.3 The system must have advanced iterative reconstruction available specifically designed to reduce image noise.

2.6. User control terminal:

2.6.1 The user control must include a graphic user interface.

2.6.2 The User control terminal must meet the minimum Picture Archiving and Communication System (PACS) requirements.

2.6.3 The user control panel must display the expected dose and actual dose (CTDI and DLP) for every series.

2.6.4 The user control panel must display the total dose (CTDI and DLP) delivered during a patient study.

2.6.5 The user control must enable the automation of routine workflow steps.

2.6.6 The user interface must include a flat panel monitor with a minimum screen size of 19" when measured diagonally corner to corner.

2.6.7 The user control must include pre-recorded patient instructions in English and in other languages.

2.6.8 The user control must include an intercom for communication with the patient.

2.6.9 Access to configuration settings, including scanning protocols must be based on user login rights.

2.6.10 The user control must include contrast concentration monitoring (for contrast enhanced studies).

2.7. Ancillary Equipment/Contrast injector Connection:

2.7.1 It must be possible to connect a CT injector at a basic level (handshaking) so that it impossible to initiate contrast administration unless the CT system is ready.

2.7.2 Ancillary equipment for CT operation must be available as an option to purchase and may include, power distribution and conditioning, a chiller and an uninterruptable power supply (for computer).

2.7.3 During the lifetime of the Framework Agreement, ancillary equipment requested by NHS Supply Chain customers will be subject to change dependent upon their final specification and individual requirements.

3. Line 2 - Advanced CT Scanner

3.1. This is the core specification for the supply, delivery, installation and commissioning of an advanced CT scanner system, capable of fast sequential and helical scanning and reconstruction, producing high quality, essentially artefact-free images, at dose levels which are as low as reasonably practicable. In addition, the system must be capable of an advanced application such as cardiac imaging, wide coverage dynamic studies, and dual energy imaging.

3.2. The core components of an advanced CT system:

3.2.1 CT gantry with X-Ray generator and X-Ray tube.

3.2.2 Patient table.

3.2.3 Image reconstruction computer.

3.2.4 User control terminal.

3.2.5 Contrast injector connection and ancillary equipment.

3.3. CT gantry with X-Ray generator and X-Ray tube:

3.3.1 The X-Ray generator must have a minimum power of 50 kW.

3.3.2 The detector must have at least 64 rows of slices.

3.3.3 The z-axis coverage of the detector must be at least 35 mm for a single axial rotation.

3.3.4 The minimum image thickness must be <= 0.625 mm.

3.3.5 The minimum rotation time must be at least 0.5 seconds.

3.3.6 The CT system must include an automatic dose control system.

3.3.7 Patient table and gantry movement controls must be located on either side of the gantry opening.

3.3.8 The gantry aperture must be at least 70 cm.

3.3.9 The gantry must include patient positioning lasers in both the PA and lateral planes.

3.3.10 The coincidence of the laser beam and scan plane must be <= 2 mm.

3.3.11 The kVp range must be at least 80 to 135 kVp.

3.3.12 The X-Ray tube must have a heat capacity of at least 5 MHU.

3.3.13 The X-Ray tube must have a maximum cooling rate of at least 800 kHU/min.

3.3.14 The X-Ray tube must contain at least two automatically selectable focal spots.

3.3.15 The X-Ray tube must contain automatically selectable filtration based on selected field of view.

3.3.16 The maximum field of view must be at least 50 cm.

3.3.17 The CT system must be able to acquire 2D projection radiographic images for scan planning in both PA, AP and lateral projections.

3.3.18 Planning radiographs must be acquired for a minimum of 1.5 metres.

3.3.19 Limiting high contrast spatial resolution, scan plane (lp/cm @10% MTF) must be at least 13 lp/cm.

3.3.20 Limiting high contrast spatial resolution, scan plane (lp/cm @0% MTF) must be at least 15 lp/cm.

3.3.21 Deviation of the image thickness from nominal value in sequential and helical scanning must be less than 40% for nominal thickness < 1 mm.

3.3.22 Deviation of the image thickness from nominal value in sequential and helical scanning must be less than 30% for nominal thickness > 1 mm.

3.3.23 Low contrast resolution must be at least 2.5mm diameter @ 0.25% contrast in Catphan for maximum 25 mGy surface dose (32 cm diameter CTDI phantom).

3.3.24 The uniformity of CT numbers must be at least 4 HU across a 25 cm diameter water filled phantom.

3.4. Patient table:

3.4.1 The total scannable range must be at least 1.5 metres.

3.4.2 The table positioning accuracy must be at least +/- 0.25 mm.

3.4.3 The table must lower to within 65 cm of the floor.

3.4.4 The maximum patient weight at specified table positioning accuracy must be at least 200 kg.

3.5. Image reconstruction computer:

3.5.1 The image reconstruction rate must be at least 16 images per second (512 x 512 matrix).

3.5.2 Raw data storage capacity must be at least 250 GB.

3.5.3 The system must have available advanced iterative reconstruction specifically designed to reduce image noise if required.

3.5.4 Increased specification computing hardware must be available to provide iterative reconstruction rates of 15 images per second if required.

3.6. User control terminal:

3.6.1 The user control must include a graphic user interface.

3.6.2 The User control terminal must meet the minimum PACS requirements.

3.6.3 The user control panel must display the expected dose and actual dose (CTDI and DLP) for every series.

3.6.4 The user control panel must display the total dose (CTDI and DLP) delivered during a patient study.

3.6.5 The user control must enable the automation of routine workflow steps.

3.6.6 The user interface must include a flat panel monitor with a minimum screen size of 19" when measured diagonally corner to corner.

3.6.7 The user control must include pre-recorded patient instructions in English and other languages.

3.6.8 The user control must include an intercom for communication with the patient.

3.6.9 Access to configuration settings, including scanning protocols must be based on user login rights.

3.6.10 The user control must include contrast concentration monitoring (for contrast enhanced studies).

3.6.11 The user control must have available prospective and retrospective ECG gated X-Ray tube modulation.

3.7. Contrast injector connection and ancillary equipment:

3.7.1 It must be possible to connect a CT injector at a basic level (handshaking) so that it impossible to initiate contrast administration unless the CT system is ready.

3.7.2 Ancillary equipment for CT operation must be available as an option to purchase and may include, power distribution and conditioning, a chiller and an uninterruptable power supply (for computer).

3.7.3 During the lifetime of the Framework Agreement, ancillary equipment requested by NHS Supply Chain customers will be subject to change dependent upon their final specification and individual requirements.

4. Line 3 – Premium CT Scanner

4.1. This is the core specification for the supply, delivery, installation and commissioning of a premium CT scanner system, capable of fast sequential and helical scanning and reconstruction, producing high quality, essentially artefact-free images, at dose levels which are as low as reasonably practicable. In addition, the system must be capable of an advanced application such as cardiac imaging, wide coverage dynamic studies, and dual energy imaging.

4.2. The core components of an advanced CT system:

4.2.1 CT gantry with X-Ray generator and X-Ray tube.
4.2.2 Patient table.
4.2.3 Image reconstruction computer.
4.2.4 User control terminal.
4.2.5 Contrast injector connection and ancillary equipment.

4.3. CT gantry with X-Ray generator and X-Ray tube:

4.3.1 The X-Ray generator must have a minimum power of 72 kW.
4.3.2 The detector must have at least 128 rows of slices.
4.3.3 The z-axis coverage of the detector must be a minimum of 38mm for a single axial rotation.
4.3.4 The minimum image thickness must be <= 0.625 mm.
4.3.5 The minimum rotation time must be at least 0.35 seconds.
4.3.6 The CT system must include an automatic dose control system.
4.3.7 Patient table and gantry movement controls must be optionally located on both sides of the gantry opening.
4.3.8 The gantry aperture must be at least 70 cm.
4.3.9 The gantry must include patient positioning lasers in both the PA and lateral planes.
4.3.10 The coincidence of the laser beam and scan plane must be <= 2 mm.
4.3.11 The kVp range must be at least 80 to 135 kVp.
4.3.12 The X-Ray tube must have a heat capacity of at least 8 MHU.
4.3.13 The X-Ray tube must have a maximum cooling rate of at least 1000 kHU/min.
4.3.14 The X-Ray tube must contain at least two automatically selectable focal spots.
4.3.15 The X-Ray tube must contain automatically selectable filtration based on selected field of view.
4.3.16 The maximum field of view must be at least 50 cm.
4.3.17 The CT system must be able to acquire 2D projection radiographic images for scan planning in both PA, AP and lateral projections.
4.3.18 Planning radiographs must be acquired for a minimum of 1.5 metres.
4.3.19 Limiting high contrast spatial resolution, scan plane (lp/cm @10% MTF) must be at least 13 lp/cm.
4.3.20 Limiting high contrast spatial resolution, scan plane (lp/cm @0% MTF) must be at least 15 lp/cm.
4.3.21 Deviation of the image thickness from nominal value in sequential and helical scanning must be less than 40% for nominal thickness < 1 mm.

4.3.22 Deviation of the image thickness from nominal value in sequential and helical scanning must be less than 30% for nominal thickness > 1 mm.

4.3.23 Low contrast resolution must be at least 2.5mm diameter @ 0.25% contrast in Catphan for maximum 25 mGy surface dose (32 cm diameter CTDI phantom).

4.3.24 The uniformity of CT numbers must be at least 4 HU across a 25 cm diameter water filled phantom.

4.4. Patient table:

4.4.1 The total scannable range must be at least 1.5 metres.

4.4.2 The table positioning accuracy must be at least +/- 0.25 mm.

4.4.3 The table must lower to within 65 cm of the floor.

4.4.4 The maximum patient weight at specified table positioning accuracy must be at least 200 kg.

4.5. Image reconstruction computer:

4.5.1 The image reconstruction rate must be at least 22 images per second (512 x 512 matrix).

4.5.2 Raw data storage capacity must be at least 500 GB.

4.5.3 The system must have available the most advanced iterative reconstruction specifically designed to reduce image noise if required.

4.5.4 Increased specification computing hardware must be available to provide iterative reconstruction rates of 20 images per second if required.

4.6. User control terminal:

4.6.1 The user control must include a graphic user interface.

4.6.2 The User control terminal must meet the minimum PACS requirements.

4.6.3 The user control panel must display the expected dose and actual dose (CTDI and DLP) for every series.

4.6.4 The user control panel must display the total dose (CTDI and DLP) delivered during a patient study.

4.6.5 The user control must enable the automation of routine workflow steps.

4.6.6 The user interface must include a flat panel monitor with a minimum screen size of 19” when measured diagonally corner to corner.

4.6.7 The user control must include pre-recorded patient instructions in English.

4.6.8 The user control must include an intercom for communication with the patient.

4.6.9 Access to configuration settings, including scanning protocols must be based on user login rights.

4.6.10 The user control must include contrast concentration monitoring (for contrast enhanced studies).

4.6.11 The user control must have available prospective and retrospective ECG gated X-Ray tube modulation.

4.7. Contrast injector connection and ancillary equipment:

4.7.1 It must be possible to connect a CT injector at a basic level (handshaking) so that it impossible to initiate contrast administration unless the CT system is ready.

4.7.2 Ancillary equipment for CT operation must be available as an option to purchase and may include, power distribution and conditioning, a chiller and an uninterruptable power supply (for computer).

4.7.3 During the lifetime of the Framework Agreement, ancillary equipment requested by NHS Supply Chain customers will be subject to change dependent upon their final specification and individual requirements.

5. Line 6 - Wide Bore CT Scanner for Radiotherapy Simulation

5.1. This is the core specification for the supply, delivery, installation and commissioning of a wide bore CT scanner system for radiotherapy simulation, specifically configured to meet the needs of radiotherapy treatment simulation and planning. In general, the system will be capable of sequential and helical scanning and reconstruction, producing high accuracy, essentially artefact-free images, at dose levels which are as low as reasonably practicable.

5.2. The core components of a wide bore CT scanner system for radiotherapy simulation:

5.2.1 CT gantry with X-Ray generator and X-Ray tube.

5.2.2 Patient table.

5.2.3 Room laser alignment system.

5.2.4 Image reconstruction computer.

5.2.5 User control terminal.

5.3. CT gantry with X-Ray generator and X-Ray tube:

5.3.1 The X-Ray generator must have a minimum power of 50 kW.

5.3.2 The detector must have at least 16 rows of slices.

5.3.3 The minimum image thickness must be <= 0.75 mm.

5.3.4 The minimum rotation time must be at least 1.0 seconds.

5.3.5 The CT system must include an automatic dose control system.

5.3.6 The gantry aperture must be at least 80 cm.

5.3.7 The gantry must include patient positioning lasers in both the PA and lateral planes.

5.3.8 The coincidence of the laser beam and scan plane must be <= 2 mm.

5.3.9 The kVp range must be at least 80 to 135 kVp.

5.3.10 The X-Ray tube must have a heat capacity of at least 3 MHU.

5.3.11 The X-Ray tube must have a maximum cooling rate of at least 800 kHU/min.

5.3.12 The X-Ray tube must contain at least two automatically selectable focal spots.

5.3.13 The X-Ray tube must contain automatically selectable filtration based on selected field of view.

5.3.14 The maximum field of view must be at least 60 cm.

5.3.15 The CT system must be able to acquire 2D projection radiographic images for scan planning in both PA, AP and lateral projections.
5.3.16 Planning radiographs must be acquired for a minimum of 1.5 metres.
5.3.17 The option to integrate respiratory gating must be available.
5.3.18 The uniformity of CT numbers must be at least 5 HU across the entire extended field of view.
5.3.19 The range of HU numbers must be at least -1000 to 4000 HU.
5.3.20 Metal artefact reduction and correction features must be provided.
5.3.21 The system must be supplied with phantoms to enable testing of position and CT number accuracy.
5.3.22 Limiting high contrast spatial resolution, scan plane (lp/cm @10% MTF) must be at least 13 lp/cm.
5.3.23 Limiting high contrast spatial resolution, scan plane (lp/cm @0% MTF) must be at least 15 lp/cm.
5.3.24 Deviation of the image thickness from nominal value in sequential and helical scanning must be less than 40% for nominal thickness < 1 mm.
5.3.25 Deviation of the image thickness from nominal value in sequential and helical scanning must be less than 30% for nominal thickness > 1 mm.
5.3.26 Low contrast resolution must be at least 2.5mm diameter @ 0.25% contrast in Catphan for maximum 25 mGy surface dose (32 cm diameter CTDI phantom).
5.3.27 The uniformity of CT numbers must be at least 4 HU across a 25 cm diameter water filled phantom.

5.4. Patient table:
5.4.1 The total scannable range must be at least 1.5 metres.
5.4.2 The table positioning accuracy must be at least +/- 0.25 mm.
5.4.3 The table must lower to within 65 cm of the floor.
5.4.4 The patient weight at specified table positioning accuracy must be at least 200 kg.
5.4.5 The table must have a flat top with indexing matching standard radiation therapy treatment systems.
5.4.6 Radiation therapy patient positioning aids must be available.

5.5. Room laser alignment system:
5.5.1 Sagittal plane ceiling mounted lasers must be available with positioning accuracy of at least 2 mm at isocentre.
5.5.2 Coronal plane wall mounted lasers must be available with positioning accuracy of at least 2 mm at isocentre.
5.5.3 Axial plane vertical wall mounted lasers must be available with positioning accuracy of at least 2 mm at isocentre.

5.6. Image reconstruction computer:
5.6.1 The image reconstruction rate must be at least 16 images per second (512 x 512 matrix).
5.6.2 Raw data storage capacity must be at least 250 GB.

5.7. User control terminal:

5.7.1 The user control must include a graphic user interface.

5.7.2 The User control terminal must meet the minimum PACS requirements.

5.7.3 The user control panel must display the expected dose and actual dose (CTDI and DLP) for every series.

5.7.4 The user control panel must display the total dose (CTDI and DLP) delivered during a patient study.

5.7.5 The user control must enable the automation of routine workflow steps.

5.7.6 The user interface must include a flat panel monitor with a minimum screen size of 19" when measured diagonally corner to corner.

5.7.7 The user control must include pre-recorded patient instructions in English.

5.7.8 The user control must include an intercom for communication with the patient.

5.7.9 Access to configuration settings, including scanning protocols must be based on user login rights.

5.7.10 The image manipulation tools must include DRR and MPR reconstruction.

5.7.11 The user control must offer tools specific to radiation therapy simulation if required by the customer.

5.7.12 The user control must meet the DICOM RT (Digital Imaging and Communications in Medicine) conformance standards.

6. Line 7 - Mobile CT Scanner System for Whole Body Studies

6.1. This is core specification for the supply, delivery, installation and commissioning of a mobile CT scanner system, suitable for whole-body studies outside a radiology department.

6.2. The core components of a mobile CT scanner system, suitable for whole-body studies:

6.2.1 The system must incorporate an emergency stop button for use by the operator.

6.2.2 CT gantry with X-Ray generator and X-Ray tube.

6.2.3 Patient table.

6.2.4 User control terminal.

6.2.5 Radiographers workstation.

6.2.6 IT connectivity.

6.3. CT gantry with X-Ray generator and X-Ray tube:

6.3.1 The system must include a high frequency X-Ray generator.

6.3.2 The X-Ray generator must have a minimum power of 30 kW.

6.3.3 The z-axis coverage of the detector must be at least 30 mm.

6.3.4 The minimum image thickness must be <= 2 mm.

6.3.5 The minimum rotation time must not be longer than 2 seconds.

6.3.6 The CT system must include an automatic dose control system.

6.3.7 The gantry aperture must be at least 85 cm.

6.3.8 The gantry must include patient positioning lasers in both the PA and lateral planes.
6.3.9 The coincidence of the laser beam and scan plane must be <= 2 mm.
6.3.10 The kVp range must be at least 80 to 120 kVp.
6.3.11 The X-Ray tube must have a heat storage of at least 1.7 MHU.
6.3.12 The maximum field of view must be at least 50 cm.
6.3.13 The CT system must be able to acquire 2D projection radiographic images for scan planning.
6.3.14 The system must have a CT number accuracy within +/-7 HU.
6.3.15 The uniformity of CT numbers must be at least 5 HU across the entire extended field of view.
6.3.16 The range of HU numbers must be at least -1000 to 4000 HU.
6.3.17 Limiting high contrast spatial resolution, scan plane (4lp/cm @10% MTF) must be at least 5 lp/mm.
6.3.18 Limiting high contrast spatial resolution, scan plane (6lp/cm @2% MTF) must be at least 6 lp/mm.
6.3.19 Deviation of the image thickness from nominal value in either sequential or helical scanning must be less than 10% for nominal thickness <1.5mm +/- 0.4mm.
6.3.20 The uniformity of CT numbers must be at least +/-4 HU across a 25 cm diameter water filled phantom.
6.3.21 The system must weigh less than 1700kg.
6.3.22 The system must be motorised allowing it to be mobile and readily movable.
6.3.23 The system must have a foot print smaller than 3 square metres.
6.3.24 The system must be battery powered and supplied with batteries that provide continuous power to the detector and computers for a minimum of 12 hours.
6.3.25 The system must be supplied with a UK standard power connector.
6.3.26 The system must have a drive system that translates the gantry slowly across a smooth floor with accurate movements for axial scan.

6.4. Patient table:
6.4.1 The table must be designed for use in the operating theatre.
6.4.2 The total scannable range must be at least 1 metre.
6.4.3 The maximum patient weight at specified table positioning accuracy must be at least 180 kg.
6.4.4 The table must have at least two positioning speeds.
6.4.5 The table must lower to within 80 cm of the floor.

6.5. User control terminal:
6.5.1 The user control must include a graphic user interface.
6.5.2 The system be supplied and supported to allow integration with the workflow and image management system run by the Healthcare Enterprise e.g. Hospital's PACS.

6.5.3 The user control panel must display the expected dose (CTDI and DLP) for every series.

6.5.4 The user control panel must display the total dose (CTDI and DLP) delivered during a patient study.

6.5.5 The user control must enable the automation of routine workflow steps.

6.5.6 The user control must include a means to store images on portable media (DVD or USB).

6.5.7 Access to configuration settings, including scanning protocols must be based on user login rights.

6.6. Radiographers Workstation:

6.6.1 The image reconstruction rate must be at least 10 images per second (512 x 512 matrix).

6.6.2 Image storage must be at least 750GB.

6.6.3 A secondary workstation must be available that enables access to previously acquired patient images without interrupting workflow.

6.6.4 Additional software tools must be available as an option to purchase.

6.6.5 The system must export images in conformance to DICOM 3.0.

6.7. IT Connectivity:

6.7.1 The following SOP classes must be available (minimum or preferred – Service Class User (SCU) and/or Service Class Provider (SCP) as indicated):

6.7.1.1 Computed radiography image storage (SCU minimum, SCU/SCP preferred).

6.7.1.2 Digital X-Ray (DX) image storage (SCU minimum, SCU/SCP preferred).

6.7.1.3 Modality work list (minimum SCU).

6.7.1.4 Verification (minimum SCU/SCP).

7. Line 8 - Mobile CT scanner system for head and neck studies

7.1. This is the core specification for the supply, delivery, installation and commissioning of a mobile CT scanner system, suitable for head and neck studies outside a radiology department.

7.2. The core components of a mobile CT scanner system, suitable for head and neck studies.

7.2.1 The system must incorporate an emergency stop button for use by the operator.

7.2.2 CT Gantry containing X-Ray generator and X-Ray tube.

7.2.3 User control terminal.

7.2.4 Patient head positioner and radiation shields.

7.2.5 IT connectivity.

7.3. CT gantry with X-Ray generator and X-Ray tube:

7.3.1 The system must include a high frequency X-Ray generator.

7.3.2 The X-Ray generator must have a minimum power of 1 kW.
7.3.3 The z-axis coverage of the detector must be at least 10 mm.
7.3.4 The minimum image thickness must be <= 1.25 mm.
7.3.5 The minimum rotation time must be at least 2 seconds.
7.3.6 The CT system must include an automatic dose control system.
7.3.7 The gantry aperture must be at least 32 cm.
7.3.8 The gantry must include patient positioning lasers in both the PA and lateral planes.
7.3.9 The coincidence of the laser beam and scan plane must be <= 2 mm.
7.3.10 The kVp range must be at least 80 to 120 kVp.
7.3.11 The X-Ray tube must have a heat storage of at least 400 kHU.
7.3.12 The maximum field of view must be at least 25 cm.
7.3.13 The CT system must be able to acquire 2D projection radiographic images for scan planning.
7.3.14 The system must have a CT number accuracy within +/-7 HU.
7.3.15 The uniformity of CT numbers must be at least 5 HU across the entire extended field of view.
7.3.16 The range of HU numbers must be at least -1000 to 4000 HU.
7.3.17 Limiting high contrast spatial resolution, scan plane (4lp/cm @10% MTF) must be at least 5 lp/mm.
7.3.18 Limiting high contrast spatial resolution, scan plane (6lp/cm @2% MTF) must be at least 6 lp/mm.
7.3.19 Deviation of the image thickness from nominal value in sequential or helical scanning must be less than 10% for nominal thickness < 1.5 +/- 0.4mm.
7.3.20 The uniformity of CT numbers must be at least 2 HU across a uniform phantom.
7.3.21 The system must be motorised allowing it to be mobile and readily moved.
7.3.22 The system must be supplied with a UK standard power connector.

7.4. User control terminal:
7.4.1 The user control must include a graphic user interface.
7.4.2 The system be supplied and supported to allow integration with the workflow and image management system run by the Healthcare Enterprise e.g. Hospital's PACS.
7.4.3 The user control panel must display the expected dose (CTDI and DLP) for every series.
7.4.4 The user control panel must display the total dose (CTDI and DLP) delivered during a patient study.
7.4.5 The user control must enable the automation of routine workflow steps.
7.4.6 The user control must include automatic contrast triggering.
7.4.7 The user control must include a means to store images on portable media (DVD or USB).
7.4.8 Access to configuration settings, including scanning protocols must be based on user login rights.

7.4.9 The user control panel must include individual user log in and configurable auto log-off time.

7.4.10 The image reconstruction rate must be at least 10 images per second (512 x 512 matrix).

7.4.11 Image storage must be at least 750GB.

7.4.12 The system must export images in conformance to DICOM 3.0.

7.5. Patient head positioner and radiation shields:

7.5.1 The system must have patient positioning aid accessories, such as head holders, that are straightforward to use and requiring minimal assistance.

7.6. IT Connectivity:

7.6.1 The following SOP classes must be available (minimum or optional - SCU and or SCP as indicated):

7.6.1.1 Computed Radiography Image Storage (SCU minimum, SCU/SCP preferred).

7.6.1.2 Digital X-Ray (DX) Image Storage (SCU minimum, SCU/SCP preferred).

7.6.1.3 Modality Work list (minimum SCU).

7.6.1.4 Verification (minimum SCU/SCP).