Introduction
The GE VCT maintenance course is a skills development course designed as a continuation of the GE BrightSpeed & LightSpeed CT courses. Through attending this course, the service professional will become self-confident in working on the gantries, patient transports, detector assemblies, 32 & 64 slice DAS systems, image processing systems, X-ray control systems, rotor controls, and operator console types of the GE VCT. Hands-on lab time is emphasized, and makes up approximately 80% of the overall course content.

Prerequisites
To attend this course, the service professional must have an extensive knowledge of CT physics, physical principles and service procedures gained through attendance at the RSTI GE BrightSpeed & LightSpeed CT courses, or equivalent training and experience.

Objectives
Following attendance of this course, participants will be able to:
- Perform scheduled maintenance on GE VCT systems
- Change the X-ray tube, realign and recalibrate the X-ray generator
- Calibrate, replace and align the collimator
- Calibrate, service, align, and use diagnostic tools to evaluate performance of the DAS and detector assembly
- Calibrate, replace and align the hardware associated with the gantry and patient transport
- Diagnose and correct problems in the scanning sequence
- Troubleshoot gantry, patient transport and X-ray system problems
- Diagnose and correct problems in the digital acquisition system and detector array
- Diagnose and correct problems in the image generation system
- Troubleshoot the operator workstation problems

Course Outline
Day 1
- System Overview & Specifications
  - Documentation
  - Terms & Acronyms
  - Patient Support
    - Types & Lab
    - Generator
    - Hercules Tube
    - JEDI Generator
  - VCT DAS Types
    - 32/64
    - VDAS
    - HDAS
    - HDAS Saturn
- System operation and power distribution
  - Systems operational parameters
  - Major system component identification

Lab Activities
- Scheduling an exam
  - Patient registration
  - Selecting technique parameters
    - Scout view
    - Axial views
    - Helical views
- Power distribution cont’d
  - Verify AC power supplies
    - Main power distribution
    - Gantry power
    - Table power
    - Console Power
  - Verify DC power supplies
    - Control system power supplies
    - Gantry power supplies
      - Stationary
      - Rotating
    - Table power supplies
    - X-ray system power supplies
      - X-ray generator
      - X-ray tube rotor control
      - Collimator
    - Detector/DAS area DC power supplies
Servicing the GE VCT System
32/64 Slice

Day 2
- Console Types
  - GOC 5
  - GOC 6
  - GOC 6.5
  - GOC 6.6
- Motor verification and replacement
  - Gantry rotation
    - Axial speed control
    - Axial motor driver
    - Harmonization/encoding
  - Patient transport/table movement and indexing
    - Tabletop horizontal control
      - Speed control
      - Motor drivers
      - Harmonization/Encoding
    - Table vertical travel
      - Speed control
      - Motor drive
      - Position indication
  - Laser position indicators
    - Operation
    - Alignment

Lab Activities
- Command line troubleshooting
- Functional Checks
- Daily QA
- Gantry rotation
  - Axial driver verification
    - Axial motor driver waveforms
    - Rotational speed tests
  - Drive assembly mechanical adjustments
  - Encoder verification
  - Patient transport
    - Vertical motor driver waveforms
  - Vertical position indication
  - Horizontal motor driver waveforms
  - Encoder verification
  - Laser adjustments

Day 3
- X-ray generation
  - High voltage control
  - Filament controls
    - Filament drive
    - Rotor controller
    - Collimator controls
    - Filter control
  - Hercules X-ray tube change
    - Tube selection
    - De-install/install issues
    - Required calibrations and alignment

Lab Activities
- Hercules X-ray tube change
  - De-install procedures
  - Installation procedures
- High voltage control waveforms
  - Intermediate voltage verification
  - kV demanded
  - kV actual
  - VCO frequency
  - IGBT/SCR gate drive
  - kV calibration
  - Filament drive waveforms
  - Filament drive demanded
  - Filament drive actual
  - mA demanded
  - mA actual
  - mA calibration

Day 4
- Detector and DAS
  - Detector architectures
    - Maintenance issues
    - Detector replacement
  - DAS architectures
    - Pre-amp/channel boards
    - DAS control
    - Data convolution
  - Data transmission
    - Fiber optics
  - Slip ring data transfers
    - Brushes
    - RF transmitters
- Image processing and handling
  - Front end processing
  - Temporary preprocessed data storage
  - Image reconstruction
  - Processed image handling
    - Image generation for display
    - Image storage
      - System disk
      - MOD
      - CD/DVD ROM
      - Print services
      - DICOM

Lab Activities
- SUIF
  - Diagnostics
  - Error Reporting
- Pre-amp/channel board verification
  - Detector output mapping
  - Pre-amp measurements
- Detector/DAS replacement
  - Removal procedures
  - Installation and alignment
Servicing the GE VCT System
32/64 Slice

Hands-On Training Course
Course Length: 2 Weeks
CEU’s Awarded: 8 CEU’s
State of Ohio Registration No. 93-09-1377T

Day 5
- System control and image quality
  - System host computer
    - Field replaceable units
    - System hard drives
  - System to gantry control
    - Stationary controls
    - Rotating controls
  - System to x-ray system control
    - X-ray generation
    - Collimation/filter
  - System to image processing/handling
  - Image quality control tests

Lab Activities

- Calibration
  - Data transfer verification
  - DAS data output
  - Data transfer verification
  - Data to image processing verification
- Image reconstruction system testing
  - Image processor
  - Image generator
- Image reconstruction testing
  - Real time reconstruction
  - Retro-reconstruction
- Manage image files
  - Image disks
    - Replacement
    - Managing storage space
  - MOD
  - DICOM setup
  - Printer setup

- System control communications verification
  - System state back-up and restore
- QC phantom image evaluation
  - Resolution
  - Contrast
  - CT number tracking
  - Image noise
- System troubleshooting
  - Electronic
  - Software assisted
- Course review
- Final exam
- Course evaluation

30745 Solon Road • Solon, OH 44139 • P440.349.4700 • F440.349.2053 • Toll-Free 1.833.229.7784
www.rsti-training.com • registration@rsti-training.com