3D Tomo Digital Mammography: Siemens Inspiration (3 Days)

RADIOLOGICAL SERVICE TRAINING INSTITUTE

Introduction

The Siemens Inspiration 3D Tomo training course will provide engineers with the necessary knowledge to maintain Dimensions 2D or 3D Tomo systems. This course is designed to give the service professional the insight to evaluate image quality problems, determine if the mammographic unit is the source of the image problem and take the appropriate steps to correct the deficiency.

Given today's regulatory environment maintaining the system at peak performance is of the utmost importance.

At the completion of this course students will be able to perform all Dimensions system maintenance procedures including:

- Calibration (including Tomo)
- Gantry maintenance
- AWS (Acquisition Workstation) maintenance
- Imaging chain maintenance
- Detector pixel calibration
- Troubleshooting

Prerequisites

To attend this course, the service professional must have attended Phase I and possess fundamental knowledge and understanding of the principles of X-ray and basic electronics.

Objectives

- Identify the major components of the Inspiration 3D Tomo system
- Describe the functional characteristics of each sub-system of the Inspiration 3D Tomo system
- Describe the factors that affect digital mammographic image quality
- Describe how those factors are optimized to produce the highest quality digital mammographic images
- Complete all operator, administration, and application/Syngo tasks
- Describe the function of the basic components of the Inspiration 3D Tomo mammographic unit
- Perform the necessary tests to reproduce the results of the physicist's report to confirm corrective action
- Perform all system calibrations and adjustments to maintain the highest quality images and compliance with MQSA requirements
- Perform detector related maintenance and Pixel calibration procedures to maintain detector image quality
- Demonstrate OS competence to be able to handle AWS maintenance, backup, restore, and calibrations
- Perform complete Preventive Maintenance procedures as performed by the OEM
- Evaluate circuit functions to facilitate troubleshooting

Course Outline

Day 1

- Course introduction
- Inspiration 3D Tomo system
  - Components
  - Terms/acronyms
  - System documentation
  - Manual set overview
- System logins
- Mammographic regulatory overview
- Digital mammography technology overview
- Direct vs. indirect digital capture
- Digital image quality factors:
  - DQE
  - Noise/SNR
  - Contrast
  - MTF
  - Spatial resolution
- Documentation
- Service Access & Service Keys (AIAT)
- Inspiration 3D Tomo quality control
- Functional checks
- Lab Activities
  - Major system component identification
    - STU – Single Tank Unit
    - MFI – Multi Freq Inverter
    - CBA - Controller Board Arm
    - CBS - Controller Board Stand
    - PSU – Power Supply Unit
- Inspiration 3D Tomo basic operation

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

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- System power-on
- System logins
- Technologist QC checks
  - Image quality
  - Flat field/Phantom IQ
- Physicist QC checks
- Lab Activities
  - X-Ray to light congruence
  - kVP accuracy
  - HVL
  - AEC accuracy
  - Tube output
  - Phantom image quality
- System power
- System communications
  - AWS
  - Syngo computer
  - Fiber optic interface
  - Gantry
  - Detector
  - X-Ray controls
- Inspiration 3D Tomo operations
- AWS acquisition software
- Operators console
- User interface/application/Syngo
- Lab Activities
  - Remove and replace covers and system panels
  - Component identification
    - AWS
    - Gantry
    - Detector
  - Component location
    - Schematic location
    - Physical location
    - Connector locations
    - Fuse location/identification
  - Selecting output devices
  - Acquiring images
- Calibration overview
- Required tools and test equipment
- Required software
- Site planning/pre-installation
- AWS configuration
- Network configuration
- Output devices
- Lab Activities
  - Configure AWS
  - Configure output devices

Day 2

- Backups
  - AWS
  - User preferences
  - Gantry/tubehead calibration data
  - Generator/AEC calibration data
- Restore system components from backup
- Operating system installation procedure
- AWS application/Syngo installation procedure
- Lab Activities
  - Backup AWS
  - Backup user preferences
  - Backup gantry/tubehead calibration data
  - Backup generator/AEC calibration data
  - Complete restore from backup
  - Clean OS install
  - Application/Syngo install
  - System restore from previous backup
- System service
- System calibration
  - kV regulation
  - Filament control
  - Motor controls
  - Collimator
- AEC calibration
- Detector calibration
- Lab Activities
  - kV calibration
  - mA calibration
  - Tubehead Adjustments
  - AEC calibration
  - Detector flat field calibration
  - Pixel mapping

Day 3

- Preventive maintenance
- Review system diagrams and communication
- Review workstation utilities and service tools
- System schematics
  - AWS
  - Gantry
  - Imaging chain
- Lab Activities
  - PM worksheet
- Troubleshooting
  - Detector troubleshooting
- Error codes
  - Download error logs from generator to service laptop
- System diagnostics
- Lab Activities
  - Troubleshooting using defective/bug boards
- Course review
- Course evaluation
- Final exam

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