GE MRI Family (SIGNA EXCITE 16X-23X, Optima 450)

Introduction

The GE Signa Excite MRI Family course is an advanced MRI course centered on progressing both system knowledge and troubleshooting experience. This course builds on the knowledge acquired in RSTI's Phase 1 and Phase 2 MRI training courses.

The course teaches service engineers the advanced concepts of MRI system operations, system software GE features, System Hardware, System Connectivity, and Service Software (SUIF).

A strong emphasis will be placed on hands-on labs to support the presentation of advanced principles.

Prerequisites

To attend this course, the service professional must have completed MRI Phase 1 (MRI Principles) and Phase 2 (Advanced MRI Service) or have equivalent experience.

Objectives

At the conclusion of this course participants will be able to:
- Understand the advanced operations of GE MRIs.
- Understand GE MRI trouble shooting tools & techniques.
- Understand magnet functionality & monitoring.
- Deeper understanding of MRI subsystems such as the RF chain, the Gradient chain, the cooling system & the MRI network.
- Diagnose and correct image artifacts.
- Diagnose and correct system failures.

Course Outline

Day 1
- MRI Safety Review
- MRI System Review
  o RF Transmit Chain
  o RF Receive Chain
  o Gradient Chain
  o Cooling / Patient Handling
  o Image Quality / Artefacts
  o Specialty Coils

Day 2
- System Software
  o Global Operators Console (GOC)
  o Workstation Management
  o System Software Functionality
  o Scan Protocol Structure
- System Documentation
  o System Documentation
  o Workstation Management

Day 3
- Service Software
  o Service Software Access
  o Event Log
  o Service Tools (SUIF)
  o Shimming Overview
- System Bootup / Shutdown

Day 4
- Multi-Generational Data (Rack)
  o Auto Pre-Scan Board (APS)
  o Applications Gateway Processor (APS)

  o Sequencing/Trigger Functions (SRF/TRF)
  o SRF/TRF Interface (STIF)
  o Interface Remote Functions (IRF)

Day 5
- Hardware: RF Transmit Chain
  o RF Transmit Chain Hardware
  o Radio Frequency Interface (RFI)
  o RF Driver Module
  o RF Power Amp (RFPA)
  o RFPA Configurations
  o Transmit (T/R) Coils
  o RF Power Monitoring

Day 6
- RF Receive Chain Coils
  o Body Coil Functions
  o Matrix Coils
  o Other Local Coils
- RF Receive Chain Hardware
- Multiplexer (MUX)
  o RF DIF boards
  o Universal Transient Noise Suppressor (UTNS)
  o Receiver Cards (RCVR)
  o Image Compute Node (ICN)
  o Image Reconstruction
  o Volume Recon Engine (VRE)

Day 7
- Hardware: Gradient Chain
  o Gradient Overview
  o Gradient Power Distribution
  o Gradient Processor Board (GP3)
  o High Fidelity Amplifiers (HFA)
  o Switchable Gradient Amplifiers (SGA)

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- o High Order Shims (HOS)
- o Gradient Filters
- o Gradient Monitors

Day 8
- Hardware: Cooling System
- o Indoor / Outdoor Cooling
- o Air / Water Cooling
- o Twin Speed Cooling Cabinet (TSCC)
- o Gradient Cooling
- o RF Amplifier Cooling
- o General Cooling
- Hardware: Patient Handling System (PHS)
- o PHS Overview
- o PHS Vertical Drive
- o PHS Horizontal Drive
- o Physiological Measuring Units (PMU)
- o PHS Controls & Monitors

Day 9
- Planned Maintenance(PM)
- o PM Schedule
- o PM Scheduler Software
- o Validating Results
- o Record Keeping
- General Troubleshooting
- o System Level Testing
- o Image Quality Issues

Day 10
- Magnet: General Information
- o Super Conducting Magnets
- o How Super Conducting works
- o GE Magnets
- o Refrigeration: Compressor
- o Refrigeration: Cold Head
- o Magnet Monitoring

- Course Review
- Final Student Evaluation

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