Principles of Servicing Nuclear Medicine Systems

RADIOLOGICAL SERVICE TRAINING INSTITUTE

Introduction

The Principles of Servicing Nuclear Medicine Systems course is a hands-on course for service professionals new to the Nuclear Medicine modality. It is designed to teach the skills necessary to service to the subsystem level. Heavy emphasis is placed on basic Nuclear Medicine principles, image analysis, operation, safe laboratory practices, system troubleshooting, and preventive maintenance. The lectures, hands-on lab procedures, and documentation are designed to provide the student with the knowledge necessary to service Nuclear Medicine systems.

Prerequisites

Attendees must possess an associate degree in electronics or equivalent experience. A background in imaging, although not a requirement, will be helpful.

Objectives

At the conclusion of this course, participants will be able to:

- Demonstrate their understanding of Nuclear Medicine principles.
- Verify system operation.
- Verify system specifications.
- Troubleshoot system problems.
- Perform first and second level preventive maintenance procedures.

Course Outline

Day 1

- Introduction to Nuclear Medicine
  - Common Nuclear Medicine studies
    - Study Terminology
  - Radiation safety
    - Licensing
    - RAM & ICCAL
  - System basic operation
    - Front panel controls
    - System specifications
- Nuclear Medicine physics
  - Atomic structure
  - Radioactive isotopes
  - Types of radiation
- Radioactive measurements
  - Energy levels
  - Roentgen, Rad, Rem
  - Half life
- Quality assurance
  - Spatial resolution
    - FWHM (Full Width at Half Max)
  - Uniformity
    - Integral
    - Differential
  - Linearity
  - Energy resolution
    - FWHM
  - Phantoms
- **Lab Activities**
  - System operation
  - Component Location
  - Spatial resolution evaluation
  - Uniformity evaluation
  - Linearity evaluation
  - Statistical measurements

Day 2

- Collimators
  - Energy levels
  - Resolution/sensitivity
  - Slant hole
  - Pinhole
- Crystals
  - Shapes and sizes
  - Handling and care
- PMTs
  - Light coupling
  - Construction and purpose
  - Gain
- Power supplies
  - Low voltage
  - High voltage
- X,Y signal processing
  - Detector
  - X,Y summing
  - Z division
  - Sample and hold
- Lab Activities
  - PMT coupling
  - Power supply measurements
- Z signal processing
  - Detector
  - PHA window
- Quality assurance checks
- Uniformity correction methods
- PM Basics
  - Cleaning
  - Filters
  - Lubrication
  - Tuning
  - Backups/Cloning/Ghosting
- **Lab Activities**
  - Flood test/calibration
  - Z PHA calibration
  - Quality assurance checks

Day 3 (1/2-day, morning)

- Troubleshooting
  - Common Failures
  - System diagnostics
- Course evaluation

30745 Solon Road · Solon, OH 44139 · **P**440.349.4700 · **F**440.349.2053 · **Toll-Free** 1.833.229.7784
www.rsti-training.com · registration@rsti-training.com

Hands-On Training Course
Course Length: 1 Week
CEU's Awarded: 4 CEU's
State of Ohio Registration No. 93-09-1377T