

## CLASS 2 SERVICE ENGINEER TRAINING PROGRAM

- 1.0 PURPOSE: To develop a staff of trained individuals capable of maintaining customer equipment in good operating condition.
- 2.0 SCOPE: This program is applicable to all individuals who work independently on teletherapy equipment at customer facilities, in accordance with proper service and assembly procedures.
- 3.0 OBJECTIVES: Upon completion of training, the candidate will be approved by the U.S. NRC as a qualified service engineer, and will be able to perform the following tasks:
- A. Service procedures specified in ISP-25, Cobalt Service Procedures Manual (as limited by certificate of training).
  - B. Installation and dismantling of teletherapy equipment.
  - C. Packaging and transportation of radioactive material.
  - D. Use radiation safety instrumentation and basic tools and equipment associated with service work.
- 4.0 REQUIREMENTS:
- 4.1 The training program shall consist of (1) approximately 5 days (40 hours) of classroom instruction on basic radiation theory and safety practices, (2) approximately 6 weeks of job-specific training on the procedures methods, etc. required to perform service tasks, and (3) approximately 3 months of on-the-job training.
  - 4.2 A trained health physicist and/or other qualified instructors under the direction of the RSU shall provide the classroom instruction. The job specific training shall be coordinated by the RSU and supervised by the Production Manager or a qualified assembly supervisor. Job specific laboratories and on-the-job shall be coordinated by the RSU and supervised by an NRC qualified service engineer.
  - 4.3 For the classroom instruction, a written examination(s) shall be administered to determine comprehension of the material presented. The examination shall be prepared, administered, and scored by the instructor. The minimum passing grade shall be 80%.
  - 4.4 Throughout the course of the job specific training, oral (which may be supported by written essay responses) walk-through, job understanding

and performance exams will be administered. The examinations will be prepared by the RSU with guidance from the Production Manager and Service Engineers. The minimum passing grade shall be 80%.

- 4.5 For on-the-job training, the candidate will perform the tasks at least two times under the supervision of an NRC approved service engineer. The service engineer will write a performance evaluation and submit it to the RSU for review and file.
- 4.6 Upon completion of all facets of this program, the RSU will submit the candidate's name and qualifications to the Isotope Committee. Upon approval of the Isotope Committee, the candidate's name and qualifications will be submitted to the U. S. NRC for approval.
- 4.7 Candidates who are approved by the NRC will be awarded a certificate of training. In addition, the individual will be issued an additional badge or wallet card which includes Company name and address, individual's name, NRC license number. AMS retains the right to change the form of this identification.
- 4.8 Candidates will continue their training until all of the above criteria has been met.
- 4.9 Refresher training shall be provided on an annual basis and whenever there is a change in procedures, regulations, or the license.
- 4.10 Documentation of all training shall be maintained by the RSU.

## 5.0 PROGRAM OF INSTRUCTION

### 5.1 Basic Radiation Therapy and Safety Practices

#### 5.1.1. Radiation Safety Training Course (24 hours) by outside Consultant

See TAB 2.

#### 5.1.2 Supplemental Radiation Training (16 hours) by RSU (See TAB 3)

### 5.2 Job Specific Training

The job specific training outlined below will be conducted at the Geneva or Cleveland facilities of Advanced Medical Systems, utilizing actual machines and equipment as available.

#### 5.2.1 Assembly of teletherapy Units (135 hours)

Blueprint reading - mechanical & schematic

QA procedures and unit acceptance criteria

- Electrical circuitry - head tilt, rotation switches
- Part number system - manuals
- Operation of control console
- 5.2.2 Unit teardown for shipment (9 hours)
  - Packing, crating, and marking
  - Disassembly procedures
  - Documentation
- 5.2.3 Unit Installation (34 hours)
  - Unpacking, assembly, and adjustment
  - Rigging equipment and installation tools
  - Radiation safety considerations regarding source loaded heads
  - Unit acceptance criterion and documentation requirements
  - Accessory names, uses, installation, and adjustment
  - Laser alignment
- 5.2.4 Machine Models (4 hours)
  - Comparison of different models
  - Operating and maintenance manuals
- 5.2.5 Basic Troubleshooting (8 hours)
  - Cobalt heads, units, tables, controls
- 5.2.6 Laboratory Exercises
  - LAB 1 - Preventive Maintenance Checks - Rotational/ Vertical Units (8 hours)
  - LAB 2 - 3706 Collimator removal and contamination check (1 hour)
  - LAB 3 - 3347 Collimator removal and contamination check (1 hour)
  - LAB 4 - 3347 Mirror replacement (3 hours)

LAB 5 - Isocenter determination and adjustment	(1 hour)
LAB 6 - Head leakage surveys	(1 hour)
LAB 7 - Loaded head installation and removal	(3 hours)
LAB 8 - Shutter bearing lubrication (590 series and 581 series)	(4 hours)
LAB 9 - Unit checkout, service tickets & customer forms	(1 hour)
LAB 10 - Leak testing	(1 hour)
LAB 11 - Radiation light field congruency check	(1 hour)

5.2.7 Emergency Procedures (3 hours)

Stuck shutter closing - laboratory exercise

Response to radiation workplace accidents

Contamination control measures (leaking source)

Incident reporting

Obligation to report non-compliance activities

5.3 On-the-Job Training

5.3.1 Performance of each task as outlined in 5.2.6 a minimum  
of two times under supervision.

5.4 Copies of written quizzes, exams, and evaluation forms are attached.

5.5 Documentation forms for job specific and on-the-job training  
are attached.

5.6 A certificate of training issued to Class 2 Service Engineer  
candidates who successfully complete the training program  
is attached.