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| government of the people’s republic of bangladesh.    National Electro-Medical Equipment Maintenance Workshop & Training Center (NEMEMW & TC)  Ministry of Health & Family Welfare, Mohakhali, Dhaka-1212  Land phone:  Fax: |
| Maintenance Management of Medical X-ray Machine |
| For Assistant & Sub-Assistant Engineer of NEMEW & DEMEW |
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| **Training section** |
| **22/10/2014** |

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| This guide book deals with Maintenance Management of Medical X-ray machine of different brands. In this book authors included X-ray Physics, X-ray hazards require basic Electric power, Basic electronics components, X-ray production, X-ray components such as X-ray tube, X-ray high voltage generator, collimator, Grid, operator consol control, different types of anode, X-ray focus X-ray Bucky Table. X-ray tube stand, Auto film processor and X-ray protecting devices and dosimeter |

Background: Technological development is a continues process and to synchronize with the technology in this year training section of the said organization has arranged four days training on Maintenance Management for Medical X-ray Machine. Here Training Executive Committee of this Organization selected four brands of X-ray Machine such as SIEMENS, LISTEM, SWEHA & ALLENGERS. In this Training committee has given more attention for the conventional medical X-ray machine with GOB funding. Chairman and Member Secretary of the training committee has made a bridge between NEMEMW & TC local agents and of the said manufactures and local agents has given the good concurrence for the bright success of the desire training. This training will be conducted through the experts of NEMEMW & TC & Local agents of foreign manufactures. Long time training was discontinuing due to vacant posts of two managers such as Technical Manager Training and Technical Repair. Besides this Organization had some limitation such training funds, training room and training logistic support.

**Outcomes of the training:** After completion of the design training the following outcome can be achieved:

1. Participants will be achieved

* Radiation hazards and radiation safety
* Proper handling of the x-ray machine
* Installation procedure
* Room environment or room preparation
* Orientation with Electronics components
* Importance of Electrical stable power supply for medical X-ray system
* Calibration and dose calibration
* Radiation protection procedure
* Understand the X-ray System
* Trouble shooting or fault detection procedure
* Preventive and periodic Maintenance
* Break down repairing technique
* Importance of Air cooler and de-humidifier for X-ray room

1. National Goal: Medical X-ray machine will be well and safe operation and ensure preventive maintenance

* Ensure radiation safety
* Patient will receive good medication support from the X-ray equipment
* Decrease the rate of breakdown maintenance and safe the government money

Table of index

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# Training course overview

# Chapter 1. Medical X-ray Physics

* 1. Atomic structure
  2. Signal, wave length , frequency , noise, filter
  3. Secondary electron emission
  4. Historical background invention of X-ray
  5. Conductor, semiconductor and Insulator
  6. Resistor, Capacitor, Inductor Diode, Trimester, rectifier,
  7. AC and DC power supply of X-ray machine

# Chapter II. X-ray basic

2.1. Fundamental of X-ray radiation

2.2. X-ray radiation Protection

2.2. X-ray production procedure

2.3. System over view of a medical X-ray machine and function of the different major component of X-ray

2.4. Different types of X-ray tube, anode, filament, Rotor, collimator, large and small focus, cooling system

2.5. High voltage X-ray Generator and High tension cable, X-ray control system and dose calibration

2.6. X-ray film, Cassette, Table Bucky, Stand Bucky and function of X-ray Grid

2.7. X-ray film processing, Auto film processor and regent for X-ray image developer

# Chapter III. Installation and Maintenance Technique of Medical X-ray machine

3.1. Room preparation or room renovation

3.2. X-ray operator consol room and patient examination room

3.3. Room shielding and Temperature and humidity control

3.4. Logic of fault detection or trouble shooting of medical X-ray machine and its prevention procedure

3.5. Preventive and periodic maintenance of X-ray machine

3.6. Module of X-ray inventory form A1 and Report writing form A2

# Chapter IV. Practical session

4.1. X-ray protecting device presentation to the participant and procedure of use

4.2. Hospital Visit with four groups and each group consist of 7 participants with two instructor one from local agent another of NEMEMEW & TC

4.3. Basic concept on computer or intelligence of computer medical X-ray machine

4.4. Office Management and Government rules and regulation for Job.

4.5. Definition of corruption and its preventive rules and regulation / procedure

Appendix / annexure

# Abbreviations or nomenclature

# Chapter 1. Medical X-ray Physics

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