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Organization, Procurement and Maintenance of Biomedical Equipment in a Medical Institution/Hospital/State

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ORGANISATION, PROCUREMENT AND MAINTENANCE OF BIOMEDICAL EQUIPMENT IN A MEDICAL INSTITUTION/HOSPITAL/STATE

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There are enormous variations between hospitals in different climates and locations, of different ages, sizes, types of physical plans and the form of care provided or kinds of patients treated still there are number of parameters common to almost every institution.

In order to establish and provide efficient engineering services to hospitals, it is important that a written plan or a guideline be developed especially when high-cost technology is involved and the funds are limited. Such a plan outlining biomedical engineering operations and procedures can be used to set and monitor how such services are delivered.

The outline of the plan shown in the following slides focuses the attention on the common elements in the organization, procurement and maintenance of bio-medical equipment in a medical institution to optimise and get the most out of limited amount of money, equipment and personnel available.

Attempts have also been made to highlight the importance of maintenance of biomedical equipment in a growing medical institution using all the latest equipment for better patient care.

SLIDE 1

-PLANNING
-PROCUREMENT
-INSTALLATION
-MAINTENANCE

-- 2

SLIDE 2

PLANNING

--REQUIREMENT

-- WORK LOAD IN TERMS OF PATIENTS

-- BUDGET

1. EQUIPMENT
2. MAINTENANCE

-- ENVIRONMENTAL INFRASTRUCTURE

A. ELECTRICITY
B. SPACE
C. ATMOSPHERIC CONDITION

-- MANPOWER INFRASTRUCTURE

-- LEVEL OF THE INSTITUTION

SLIDE 3

PROCUREMENT

-- IDENTIFICATION OF EQUIPMENT

a. MAKE
b. MODEL

-- IDENTIFICATION OF THE SOURCE

-- REPUTATION OF THE EQUIPMENT

a. PERFORMANCE
b. REGGEDNESS
c. TYPE OF TECHNOLOGY INVOLVED

-- REPUTATION OF SUPPLIER

-- AVAILABILITY OF THE SPARES

-- SERVICE AFTER PROCUREMENT

SLIDE 4

PROCUREMENT

PLACEMENT OF ORDERS

CARE SHOULD BE TAKEN OF

--MACHINE IS UNDER WARRANTY FOR A SUFFICIENT PERIOD TO TEST ITS PERFORMANCE

--SPARS FOR FIVE YEARS ARE INCLUDED IN THE ORDER

--THE MACHINE IS UNDER SERVICE CONTRACT FOR AT LEAST FIVE YEARS

--THE COMPANY UNDERTAKES TO SERVICE THE EQUIPMENT AFTER FIVE YEARS ALSO

--- 3

-- PENALITY CLAUSE OF THE COMPANY CHANGES THE LOCAL AGENT

-- TRAINING OF THE STAFF OF THE HOST INSTITUTION

--UNDERTAKING FROM THE SUPPLIER THAT THE MODEL SERVICES FOR 5-YEARS

SLIDE 5

--WHEN ORDERING EQUIPMENT THE NEED FOR BUILT-IN AUTOMATIC VOLTAGE STABILISER BE SPECIFIED

--PORTABLE INSTRUMENTS LIKE X RAY MACHINE SHOULD BE PROVIDED WITH AN AUTOMATIC VOLTAGE STABILISER ON THE CARRIER

--IN HIGHER PRIORITIES AREAS LIKE OPERATION THEATRES, RADIO-DIAGNOSIS NUCLEAR MEDICINE AND RADIOTHERAPY VOLTAGE STABILISATION SHOULD BE DONE AREAWISE

--IN AREAS WHERE THE FLUCTUATION IS VERY HIGH, A SINGLE POINT STABILISATION IS REQUIRED

--SEPARATE LINE SHOULD BE LAID WHERE VOLTAGE DROPS ARE CONSIDERABLE

--MORE THAN ONE TAPPING SHOULD NOT BE PERMITTED FOR A SINGLE POINT IN THE HIGH PRIORITY AREAS

-- TOMATIC SWITCH OVER FOR EMERGENCY SHOULD BE PROVIDED IN THE HOSPITAL WITH A DIESEL GENERATOR FOR EMERGENCY POWER SUPPLY

SLIDE 6

INSTALLATION

--MOVEMENT OF THE MACHINE IN AREA OF INSTALLATION

--DEFECTIVE MACHINE IN ANY RESPECT

--PHYSICAL INFRASTRUCTURE IN ACCORDANCE WITH THE LITERATURE ALREADY RECEIVED IS PROVIDED

--THE MACHINE IS IN ACCORDANCE WITH THE ORDER PLACED

-- VERIFICATION BY A COMPETENT PERSON

--MACHINE INSTALLED AT THE PLACE OF WORKING

LIDE 7

INSTALLATION

--VERIFICATION OF INDIVIDUAL COMPONENTS

--FUNCTIONAL VERIFICATION OF THE WHOLE EQUIPMENT

--ACCEPTANCE TESTS

--ROUTINE WORK

--DEMONSTRATION OF THE EQUIPMENT FOR ROUTINE WORK
  a. ROUTINE MAINTENANCE
  b. SIMPLE ADJUSTMENT
--PERFORMANCE ON SUFFICIENT DATA
--CERTIFICATE FROM THE COMPETENT AUTHORITY REGARDING THE ACCEPTANCE OF THE MACHINE

SLIDE 8

MAINTENANCE

--PLANNING
--POLICY
--TRAINING OF PERSONNEL
--WORKSHOP
--SPARES
--STORAGE
--MASTER MAINTENANCE PLAN FOR THE WHOLE YEAR SHOULD BE DRAWN IN CONSULTATION WITH THE HEAD OF THE DEPARTMENT
--HEAD OF THE ENGINEERING UNIT SHOULD BE COMPLETELY ACCOUNTABLE AND RESPONSIBLE FOR THE TASK UNDER HIS CONTROL
--HEAD OF THE ENGINEERING UNITS SHOULD HAVE SUFFICIENT POWERS TO TAKE ON SPOT DECISIONS REGARDING THE MAINTENANCE OF A PARTICULAR PIECE OF EQUIPMENT
--HE SHOULD HAVE SMALL PURCHASE AND STORE ORGANIZATION

SLIDE 9

MAINTENANCE PLANNING

--SHORT TERM
--LONG TERM
--MAINTENANCE WITHIN THE INSTUTION
--MAINTENANCE OUTSIDE THE INSTITUTION
--MAINTENANCE OUTSIDE THE STATE
--MAINTENANCE OUTSIDE THE COUNTRY
  SHORT TERM INCLUDES
--SKILLED MANPOWER
--A BANK OF SPARE PARTS AND CRUCIAL COMPONENTS
--ARRANGING TRAINING PROGRAMMES FOR THE PERSONNEL

SLIDE 9-A

MAINTENANCE OF EQUIPMENT

--MAINTENANCE WILL DEPEND UPON THE TYPE OF EQUIPMENT

1. CRITICAL
2. NON-CRITICAL
3. ESSENTIAL
4. NON-ESSENTIAL

SLIDE 10

MAINTENANCE

ORGANISATION

1. CENTRAL CELL INVOLVED IN
   a. PURCHASE
   b. PROCUREMENT
   c. MAINTENANCE
2. NUCLEUS OF COMMUNICATION BETWEEN THE USER AND SELLER
3. TRAINING/TEACHING PROGRAMMES
4. RECORD KEEPING
5. FOLLOW-UP OF THE SERVICE

SLIDE 11

MAINTENANCE

SMALL MAINTENANCE CENTRE

-FOUR LEVELS OF ENGINEERING STAFF FOR THE CENTRE

--HIGHLY SKILLED

--SKILLED

--SEMI SKILLED

--ORDINARY

-SEMI SKILLED SHOULD DO REPAIRING AND SERVICING OF SOPHISTICATED EQUIPMENT UNDER THE GUIDANCE OF A SKILLED PERSON AND CO-ORDINATE THE ACTIVITIES OF CENTRE

Slide 11-A

--IT SHOULD BE UNDER A UNIFIED CONTROL AND SHOULD BE MADE RESPONSIBLE FOR THE ENTIRE BIO-MEDICAL MAINTENANCE WORK

--THE EMPLOYMENT SERVICE CONDITIONS AND STATUS SHOULD BE IN CONFORMITY WITH THE PROFESSION ELSEWHERE

--THE PROPOSED SET UP SHOULD PROVIDE FOR INBUILT STRUCTURE FOR ADVANCE AND DEVELOPMENT

--THEY SHOULD BE CAUGHT YOUNG AT THE MIDELE AGE LEVEL SO THAT THEY ARE TRAINED IN INDIA

--AS TRAINING PROGRAMMES IN INDIA FOR BIO-MEDICAL MAINTENANCE EQUIPMENT ARE LACKING IN SERVICE TRAINING WHEREVER AVAILABLE SHOULD BE UTILISED

SLIDE 12

TRAINING

-- THE PERSONNEL IN THE MAINTENANCE CENTRE SHOULD BE TRAINED EITHER

BY THE INSTITUTION

BY THE COMPANY

ABROAD WHENEVER THERE IS OPPORTUNITY DEPENDING UPON THE LEVEL OF THE CASE AND NATURE OF THE EQUIPMENT

SLIDE 12-A

--SKILLED HANDS SHOULD BE SELECTED FOR EACH TASK AND RETAINED

--PETTY BUT IMPORTANT INSTRUCTIONS ARE ELIMINATED THUS REDUCING THE STRAIN FOR THE SUPERVISORY STAFF, FOR INSTANCE, TO ATTEND AN EMERGENCY CALL IN OPERATION THEATRE

--THE WORKER SHOULD BE CONVERSANT WITH THE NECESSARY DIRECTIONS

--CONTINUOUS HANDLING OF FAULTS IN EQUIPMENT LEADS TO QUICK ANTICIPATION OF THE AREAS OF TROUBLE AND EFFICIENT HANDLING. IT ALSO HELPS IN THE PURCHASE OF MINIMUM MAINTENANCE REQUIRING APPARATUS

SLIDE 13

MAINTENANCE

--WELL EQUIPPED WORKSHOP CONSISTING OF :

*MACHINE SHOP

*INSTRUMENT SHOP

*ELECTRIC SHOP

*ELECTRONIC SHOP

*CARPENTRY AND WOOD-WORK

*GLASS BLOWING

*AIR CONDITIONING AND REFRIGERATION

--ALL TECHNICIANS/TECHNOLOGISTS AND OTHER WORKERS SHOULD BE PROVIDED WITH A SEPARATE TOOL KIT WHICH CONSISTS OF ALL ESSENTIAL ITEMS REQUIRED FOR THE MAINTENANCE

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