SEMEM362

Carrying out scheduled servicing on medical equipment

Overview

This standard identifies the competences you need to carry out scheduled servicing activities on medical equipment, in accordance with approved procedures. You will be required to carry out scheduled servicing activities on a range of medical equipment such as cardiovascular equipment, physiological monitoring and infusion equipment, operating theatre and surgical equipment, anaesthetic and ventilation equipment, medical imaging equipment, laboratory equipment, dental equipment, therapeutic equipment and mechanical/electromechanical Assisted Technology (AT) equipment, in order to minimise down time caused by breakdowns, and to ensure that the equipment performs at optimal levels and functions to specification.

Your responsibilities will require you to comply with organisational policy and procedures for the scheduled servicing activities undertaken, and to report any problems with these activities, or with the tools and equipment that are used that you cannot personally resolve, or that are outside your permitted authority, to the relevant people. You must ensure that all tools, equipment and materials used in the servicing activities are removed from the work area on completion of the activities, and that all necessary job/task documentation is completed accurately and legibly. You will be expected to work with minimal supervision, taking full responsibility for your own actions, and for the quality and accuracy of the work that you carry out.

Your underpinning knowledge will provide a good understanding of your work, and will provide an informed approach to applying scheduled servicing procedures to medical equipment. You will understand the process of developing scheduled servicing systems, and their application, and will know about the servicing criteria in adequate depth to provide a sound basis for carrying out the servicing activities, correcting faults and ensuring that the serviced equipment functions to the required specification and remains compliant with all standards and regulations. In addition, you will be expected to report where the outcome identifies the need for further investigation or maintenance work.

You will understand the safety precautions required when carrying out the servicing activities, especially those for isolating the equipment. You will also understand your responsibilities for safety and the importance of taking the necessary safeguards to protect yourself and others in the workplace.

Note Corrective/breakdown servicing activities are the subject of other standards.

Performance criteria

You must be able to:

1. work safely at all times, complying with health and safety legislation and other relevant regulations, directives and guidelines
2. follow the relevant servicing schedules to carry out the required work
3. carry out the servicing activities within the limits of your personal authority
4. carry out the servicing activities in the specified sequence and in an agreed timescale
5. report any instances where the servicing activities cannot be fully met or where there are identified defects outside the planned schedule
6. complete and store all relevant servicing documentation in accordance with organisational requirements
7. dispose of waste materials in accordance with safe working practices and approved procedures and leave the work area in a safe condition

Knowledge and understanding

You need to know and understand:

1. the health and safety requirements of the area in which the scheduled servicing activity is to take place, and the responsibility these requirements place on you
2. the statutory and advisory documentation relating to medical devices (such as warnings and guidance from regulatory authority, British and European standards)
3. the importance of reporting any equipment adverse incidents to the regulatory authority
4. the isolation or permit-to-work procedure that applies to the servicing activities (such as electrical isolation, removal of fuses, placing of maintenance warning notices, proving that isolation has been achieved and secured)
5. the specific health and safety precautions to be applied during the scheduled servicing activities, and their effects on others
6. the importance of wearing protective clothing and other appropriate safety equipment (PPE) during the servicing activities
7. what constitutes a hazardous voltage and how to recognise victims of electric shock
8. how to reduce the risks of a phase to earth shock (such as insulated tools, rubber matting, isolating transformers)
9. the working practices of, and the need to respect, the hospital ward and/or patient environment
10. hazards associated with carrying out scheduled servicing activities on medical equipment (such as exposure to live conductors, misuse of tools), and how to minimise them and reduce any risks
11. how to obtain and interpret documents needed in the servicing activities (such as drawings, circuit and physical layouts, charts, specifications, manufacturers' manuals, history/maintenance reports, graphical electronic/electrical symbols)
12. the servicing schedules and methods to be followed, in order to comply with organisational procedures for scheduled servicing activities on medical equipment
13. the basic principle of operation of the medical equipment/circuits being serviced, and the function/purpose of individual components within the equipment/circuit
14. the human physiology directly associated with the medical equipment being serviced
15. the risks to the human body from external energy sources associated with the equipment being serviced
16. the different types of cabling (such as multicore cables, single core cables, steel wire armoured (SWA), mineral insulated (MI), screened cables, data cables) and their application

17. the different types of control system, their various components and maintenance requirements
18. the application and functions of a range of electrical components (such as plugs, switches, sockets, lighting and fittings, junction boxes, protection devices), and the types of checks required by each of them
19. methods of checking that components are fit for purpose, and the need to replace `lifed' items (such as hoses, seals, filters, masks, overload protection devices)
20. the procedures and precautions to be adopted to eliminate/protect against electrostatic discharge (ESD) when working on sensitive equipment or devices
21. how to make sensory checks (by sight, sound, smell, touch)
22. how to check that replacement components meet the required specification/operating conditions (such as values, tolerance, current carrying capacity, voltage rating, power rating, working temperature range)
23. the procedure for obtaining the consumables to be used during the scheduled servicing activity
24. the importance of carrying out electrical safety tests on medical equipment, and the implications if this is not carried out
25. how to complete servicing records/logs/reports that comply with organisational policy and procedures
26. the equipment operating and control procedures, and how to apply them in order to carry out scheduled servicing
27. the problems that can occur whilst carrying out the scheduled servicing activities, and how they can be avoided
28. the organisational procedure to be adopted for the safe disposal of waste of all types of material
29. the extent of your own authority and to whom you should report if you have problems that you cannot resolve

Scope/range

1. Carry out all of the following scheduled servicing activities:

    1. plan and communicate the servicing activities so as to minimise disruption to normal working
    2. obtain and use the correct issue of organisational and/or manufacturers' drawings and servicing documentation
    3. adhere to procedures or systems in place for risk assessment, COSHH, personal protective equipment and other relevant safety regulations and procedures to realise a safe system of work
    4. ensure that the correct equipment decontamination procedure has been adhered to before and after servicing
    5. ensure the safe isolation of equipment (such as mechanical, electricity, gas, air or fluids)
    6. provide and maintain safe access and working arrangements for the servicing area
    7. carry out the scheduled maintenance activity, using appropriate techniques and procedures
    8. re-connect and return the equipment to service on completion of the activities
    9. dispose of waste materials in accordance with safe working practices and approved procedures and leave the work area in a safe condition

2. Carry out scheduled servicing on three of the following types of medical equipment:

    1. cardiovascular equipment
    2. medical imaging equipment
    3. physiological monitoring and infusion equipment
    4. laboratory equipment
    5. anaesthetic and ventilation equipment
    6. dental equipment
    7. operating theatre and surgical equipment
    8. therapeutic equipment
    9. mechanical/electromechanical AT equipment

3. Carry out all of the following scheduled servicing activities:

    1. visual examination of condition and security of enclosures
    2. checking and replacing `lifed' items (such as batteries, bulbs, seals, masks, filters and hoses)
    3. removing excessive dirt from equipment
    4. checking the condition of cables and wires

5. checking the integrity of connections
6. making routine adjustments
7. inspecting and cleaning sensors
8. carrying out equipment self-analysis checks
9. monitoring the condition/deterioration of components
10. checking and reviewing the system function
11. making sensory checks (sight, sound, smell, touch)
12. checking the integrity and security of earth bonding
13. making insulation resistance checks
14. carrying out electrical safety checks
15. checking the operation of gauges (where appropriate)
16. carrying out leak checks on gas connections (where appropriate)
17. recording the results of the servicing and reporting any defects found

4. Ensure that the serviced equipment meets all of the following:

    1. organisational guidelines and codes of practice
    2. equipment manufacturer's operation range
    3. relevant and current documentation such as those provided by MHRA or the regulatory authority
    4. equipment and associated BSEN standards, CE marking and, where appropriate wiring regulations
    5. the equipment functions to specification
    6. the equipment remains compliant with all standards and regulations
    7. all potential defects are identified and reported for future action

5. Complete and store all relevant servicing documentation in accordance with organisational requirements, using one of the following:

    1. job cards
    2. servicing log or report
    3. permit to work/formal risk assessment and/or sign-on/off procedures
    4. organisational-specific documentation
    5. electronic reports

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