

Carrying out maintenance on environmental control equipment

Overview

This standard identifies the competences you need to carry out corrective maintenance activities on fixed and portable environmental control equipment, in accordance with approved procedures. This will involve dismantling, removing and replacing or repairing faulty components, in line with company procedures, on environmental control equipment such as air pollution, effluent treatment, noise and vibration control, waste and used product storing or recycling equipment.

You will be expected to cover a range of maintenance activities, such as labelling/markings to aid reassembly, dismantling components to the required level, setting, aligning and adjusting components, replacing 'lived' items, replenishing oils, greases or other fluids, torque loading components, and making 'off-load' checks before testing and starting up the maintained equipment, using appropriate techniques and procedures.

Your responsibilities will require you to comply with organisational policy and procedures for the maintenance activities undertaken, and to report any problems with these activities, or with the tools and equipment used, that you cannot personally resolve, or are outside your permitted authority, to the relevant people. You must ensure that all tools, equipment and materials used in the maintenance 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 to instructions, alone or in conjunction with others, taking personal responsibility for your own actions, and for the quality and accuracy of the work that you carry out.

Your underpinning knowledge will be sufficient to provide a sound basis for your work, and will enable you to adopt an informed approach to applying maintenance procedures to environmental control equipment. You will have an understanding of dismantling and reassembly methods and procedures, and their application. You will know how the environmental control equipment functions and the purpose of individual components, in adequate depth to provide a sound basis for carrying out any repair or adjustment. In addition, you will have sufficient knowledge of these components to ensure that they are fit for purpose and meet the specifications, thus providing a sound basis for carrying out reassembly.

You will understand the safety precautions required when carrying out the maintenance 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.

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Performance criteria

You must be able to:

1. work safely at all times, complying with health and safety and other relevant regulations, directives and guidelines
2. follow the relevant maintenance schedules to carry out the required work
3. carry out the maintenance activities within the limits of your personal authority
4. carry out the maintenance activities in the specified sequence and in an agreed time scale
5. report any instances where the maintenance activities cannot be fully met or where there are identified defects outside the planned schedule
6. complete relevant maintenance records accurately and pass them on to the appropriate person
7. dispose of waste materials in accordance with safe working practices and approved procedures

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Knowledge and understanding

You need to know and understand:

1. the health and safety requirements of the area in which the maintenance activity is to take place
2. the isolation and lock-off procedure or permit-to-work procedure that applies to the environmental control equipment being maintained
3. the specific health and safety precautions to be applied during the maintenance procedure, and their effects on others
4. the hazards associated with carrying out maintenance activities on environmental control equipment (including the use of lubricants, cleaning materials, power tools, the use and misuse of hand tools, and the consequences of not following laid-down good-practice maintenance procedures), and how they can be minimised
5. the importance of wearing protective clothing and other appropriate safety equipment (PPE) during the maintenance process
6. associated hazardous substances, their monitoring and exposure limits
7. how to obtain and interpret information from job instructions and other documentation used in the maintenance activities (such as drawings, specifications, manufacturers' manuals, BS7671/IET regulations, symbols and terminology)
8. the procedure for obtaining replacement parts, materials and other consumables necessary for the maintenance activities
9. the sequence to be adopted for the dismantling/reassembly of various types of assemblies
10. the methods and techniques used to dismantle/assemble environmental control equipment (unplugging, de-soldering, removal of screwed, clamped and crimped connections, removing bolted components and assemblies)
11. methods of checking that components are fit for purpose, how to identify defects and wear characteristics, and the need to replace 'lived' items (such as filters, seals and gaskets)
12. how to make adjustments to components/assemblies to ensure that they function correctly
13. the basic principles of how environmental control systems function, their operating sequence, the working purpose of individual units/components and how they interact
14. methods of removing and replacing components and units, without damaging the system and infrastructure
15. how to check that tools and equipment are free from damage or defects, are in a safe and usable condition, and are configured correctly for their intended purpose
16. the generation of maintenance documentation and/or reports following the maintenance activity
17. the equipment operating and control procedures to be applied during the maintenance activity

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18. how to use lifting and handling equipment correctly and safely in the maintenance activity
19. the problems associated with the maintenance activity, and how they can be overcome
20. the organisational procedure to be adopted for the safe disposal of waste of all types of materials
21. the extent of your own authority and to whom you should report if you have problems that you cannot resolve

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Scope/range related to performance criteria

1. Carry out **all** of the following during the maintenance activity:
 1. undertake the maintenance activities to cause minimal disruption to normal working
 2. use the correct issue of maintenance documentation (such as drawings, manuals, maintenance records, schedules)
 3. adhere to procedures or systems in place for risk assessment, COSHH, personal protective equipment and other relevant safety regulations
 4. ensure the safe isolation of equipment (such as mechanical, electricity, gas, air or fluids)
 5. ensure that safe access and working arrangements have been provided for the maintenance area
 6. carry out the scheduled maintenance tasks, using appropriate techniques and procedures
 7. re-connect and return the equipment to service on completion of the maintenance activities
 8. dispose of waste items in a safe and environmentally acceptable manner
 9. leave the work area in a safe and tidy condition
2. Carry out maintenance activities on **one** of the following types of environmental control equipment:
 1. air pollution control equipment (such as decarbonisation (CO₂ reduction), de-nitrification, deodorising, desulphurisation, dust collectors, smoke filters, scrubbers, and removal of refrigerant gases)
 2. effluent treatment equipment (such as aerobic and anaerobic biochemical treatment, filter screens and presses, liquid separators, waste oil treatment, sewage treatment, industrial waste water treatment)
 3. noise and vibration equipment (such as vibration prevention and isolation, noise attenuation and acoustic enclosures)
 4. waste and used product handling, storing and recycling equipment (such as appliance recycling, battery recycling, incinerators, ash handling, heat recovery, shredders and crushers, conveyors and sorters, compaction)
3. Carry out **all** of the following maintenance activities:
 1. dismantling equipment to the required level
 2. marking/labelling of components

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3. checking components for serviceability
4. replacing 'lived' items (such as filters, seals, gaskets)
5. replacing damaged/defective components
6. setting, aligning and adjusting components
7. checking the correct operation of all safety devices
8. replenishing oils, greases or other fluids
9. tightening fasteners to the required torque
10. functionally testing the completed system
- 11.

recording the results of the maintenance activity

12.

reporting or taking action with regard to any defects that require immediate attention (such as replacing non-'lived' components)

4. Maintain and/or replace **six** of the following environmental control **mechanical** components:

1. actuators
2. bearings
3. burners
4. pipework
5. couplings
6. geared drives
7. conveyor belts
8. dampers
9. chains and sprockets
10. levers and linkages
11. pulleys and belts
12. seals and gaskets
13. containment booms
14. enclosures and guards
15. exhaust components
16. lubrication components
17. mechanical isolators
18. mechanical overloads
19. flow measurement and control
20. pollution samplers
21. sorting screens
22. noise attenuation devices
23. filters (individual)
24. safety devices
25. pumps
26. valves
27. storage tanks
28. fasteners

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- 29. gauges
- 30. spill kits

or

maintain and/or replace **six** of the following environmental control **electrical** components:

- 31. wires and cables
- 32. switches and contactors
- 33. circuit boards
- 34. electrical isolators
- 35. electrical trips
- 36. motor starters
- 37. flow measurement devices
- 38. infra-red monitoring devices
- 39. interlocks
- 40. inverters
- 41. level floats and indicators
- 42. meters
- 43. relays
- 44. pollution samplers
- 45. resistors
- 46. safety devices
- 47. switchgear
- 48. sensors solenoids
- 49. switches
- 50. thermistors
- 51. thermocouples
- 52. thermostats
- 53. timers
- 54. transducers
- 55. transformers

- 5. Maintain environmental control equipment, in accordance with **one** of the following:

- 1. organisational guidelines and codes of practice
 - 2. equipment manufacturer's operation range
 - 3. company regulations
 - 4. BS, ISO and/or BSEN standards

- 6. Complete **one** of the following maintenance records, and pass it to the appropriate person:

- 1. job cards
 - 2. permit to work/formal risk assessment
 - 3. maintenance log and action report
 - 4. company-specific documentation

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