SEMEM328

Carrying out preventative planned maintenance on engineered systems

Overview

This standard identifies the competences you need to carry out preventative planned maintenance activities on engineered systems, in accordance with approved procedures. You will be required to carry out the maintenance activities on engineered systems involving at least two of the following interactive technologies: mechanical, electrical, fluid power or process controller. You will need to organise and carry out the maintenance activities to minimise down time and ensure that the maintained system performs at optimal level and functions to the required specification.

Your responsibilities will require you to comply with organisational policy and procedures for the maintenance activities undertaken, and to report any problems with the maintenance activities, tools or equipment 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 maintenance activities are removed from the work area on completion of the work, and that all necessary job/task documentation is completed accurately and legibly. You will be expected to work with minimal supervision, taking personal 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 planned maintenance procedures within an engineered system. You will know about the integrated technologies within the system, how the system functions, and potential problems or defects that may occur. You will understand the process of developing planned maintenance, and its application, and will know about the maintenance criteria, in adequate depth to provide a sound basis for carrying out the activities safely and effectively, and for ensuring that the system is maintained to the required specification and remains compliant with all standards and regulations. In addition, you will be expected to report where the outcome of the maintenance activity identifies the need for further investigation or maintenance work.

You will understand the safety precautions required when carrying out the maintenance activities, especially those for isolating the equipment and taking the necessary safeguards to protect yourself and others in the workplace. You will be required to demonstrate safe working practices throughout.

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 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 timescale
5. report any instances where the maintenance activities cannot be fully met or where there are identified defects outside the planned schedule
6. complete and store all relevant maintenance 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 maintenance activity is to take place, and the responsibility these requirements place on you
2. the isolation and lock-off procedure or permit-to-work procedure that applies to the system being maintained
3. the specific health and safety precautions to be applied during the maintenance activities, and their effects on others
4. how to recognise and deal with victims of electric shock (to include methods of safely removing the victim from the power source, isolating the power source) including the difference of AC and DC electrical shock and how this affects the victim
5. how to reduce the risks of a phase to earth shock (such as insulated tools, rubber mating and isolating transformers))
6. the importance of wearing protective clothing and other appropriate safety equipment (PPE) during the maintenance activities, and where it may be obtained
7. hazards associated with carrying out maintenance activities on an integrated system (handling fluids, stored pressure/force, electrical supplies, process controller interface, using damaged or badly maintained tools and equipment, not following laid-down maintenance procedures), and how to minimise these and reduce any risks
8. how to obtain and interpret drawings, charts, specifications, manufacturers' manuals, history/maintenance reports, wiring regulations and other documents needed for the maintenance activities
9. the various planned maintenance schedules that are generally used (such as condition based maintenance, scheduled maintenance, and total preventative maintenance (TPM))
10. the basic principles of how the system functions, its operation sequence, the working purpose of individual units/components, and how they interact
11. the equipment operating and control procedures, and how to apply them in order to carry out the planned maintenance activities
12. the testing methods and procedures to be used to check that the system conforms to acceptable limits
13. how to make sensory checks by sight, sound, smell, touch

14. the procedure for obtaining consumables and `lifed' items that will require replacing during the maintenance activity
15. organisational policy on repair/replacement of components during the maintenance activities
16. methods of checking that components are fit for purpose, and the need to replace `lifed' items such as filters, seals, gaskets, belts, chains and bearings
17. how to make adjustments to components and assemblies to ensure they function correctly
18. the generation of maintenance documentation and/or reports on completion of the maintenance activity
19. the problems that can occur during the planned 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 a problem that you cannot resolve

Scope/range

1.

Carry out all of the following during the maintenance activities:

1.1 plan and communicate the maintenance activities to cause minimal disruption to normal working
1.2 obtain and use the correct issue of organisational and/or manufacturers' drawings and maintenance documentation
1.3 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 including the electricity at work regulations
1.4 ensure the safe isolation of equipment (such as mechanical, electricity, gas, air or fluids)
1.5 provide and maintain safe access and working arrangements for the maintenance area
1.6 carry out the maintenance activities using appropriate techniques and procedures
1.7 reconnect and return the system to service on completion of the maintenance activities
1.8 record the results of the maintenance activity and report any defects found
1.9 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 planned maintenance activities on engineered systems, involving all of the following interactive technologies, to sub-assembly/component level:

2.1 mechanical

Plus two from the following:

2. fluid power/gas
3. electrical
4. process control

1.

Follow planned maintenance activities based on one of the following types of maintenance schedule:

1.1 condition based maintenance
1.2 total preventative maintenance (TPM)
1.3 scheduled maintenance
1.4 preventative planned maintenance

2.

Carry out ten of the following planned maintenance activities:

2.1 visual examination and testing of the system against the maintenance schedule
2.2 checking operation of all gauges and sensors
2.3 removing excessive dirt and grime
2.4 monitoring component condition/deterioration
2.5 checking condition of belts, bearings, seals
2.6 making sensory checks (such as sight, sound, smell, touch)
2.7 making routine adjustments
2.8 check integrity of electrical connections
2.9 carrying out leak checks on all connections
2.10 replacing `lifed' consumables (such as filters, fluids)
2.11 testing and reviewing system operation
2.12 carrying out system self-analysis checks
2.13 recording the results of the maintenance activity and reporting any defects found
2.14 examination of information relating to faults (handover, operator)

3.

Ensure the maintained equipment/system meets all of the following:

3.1 all maintenance activities have been completed to the required schedule
3.2 equipment operates within acceptable limits for successful continuous operation to meet output specification
3.3 equipment remains compliant with appropriate regulations and safety requirements
3.4 any potential defects are identified and reported for future action

4.

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

4.1 job cards
4.2 permit to work/formal risk assessment and/or sign on/off procedures
4.3 maintenance log or report
4.4 organisational-specific documentation
4.5 electronic reports

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