SEMETS344

Planning engineering activities

Overview

This standard identifies the competences you need to plan engineering activities, in accordance with approved procedures. You will need to produce plans for significant engineering activities requiring multiple stages in their execution, and this will cover such items as component/product manufacturing, assembly activities, installation, materials processing and finishing, testing and trialling, commissioning, planned maintenance, lifting, moving and transporting of goods or materials, and plans for capability studies or equipment replacement programs. You will also be required to establish the activities that must be carried out, the methods and resources to be used, and to produce a detailed plan of operation. You will be required to complete the work within agreed timescales, whilst ensuring that the activities within your control conform to organisational and legal requirements.

Your responsibilities will require you to comply with organisational policy and procedures for planning the engineering activities, and to report any problems with the activities that you cannot personally resolve, or that are outside your permitted authority, to the relevant people. You will be expected to work with a minimum of 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 the techniques and procedures used when planning engineering activities. You will understand the engineering activities within your area of responsibility, including the availability of resources, in adequate depth to provide a sound basis for carrying out the planning process to the required standard. You will understand your organisation's methods of operation, in sufficient detail to enable you to make informed decisions.

You will be aware of any health, safety and environmental requirements applicable to your area of responsibility. You will be required to demonstrate safe working practices throughout, and will understand the responsibility you owe to yourself and others in the workplace.

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. collect the information needed to prepare the plan
3. identify health and safety issues and safe working practices and procedures that must be followed
4. identify the operations to be carried out and determine their sequence
5. establish which methods are required and what resources are to be used
6. identify any special requirements and incorporate them in the plan
7. estimate timescales required
8. prepare and produce the plan
9. record and present the plan to the appropriate people when the plan is completed
10. deal effectively with problems within your control and report those that cannot be solved

Knowledge and understanding

You need to know and understand:

1. how to access information on health and safety regulations and guidelines relating to the engineering activities to be used and plans being produced
2. the implications of not taking account of legislation, regulations, standards and guidelines when producing the engineering plans
3. how to obtain information on the engineering requirements, and the type of information that is available (such as customer order requirements and instructions, quality control requirements, product specification, manufacturing methods)
4. how to access and use the appropriate information and documentation systems
5. the types of data that should be included in the engineering plans (such as activities to be carried out, sequence in which they must be carried out, timescales, resource requirements, health and safety issues)
6. how to extract information from drawings, documents and related specifications (to include symbols and conventions to appropriate BS or ISO standards and, where appropriate regulations) in relation to work being planned
7. the materials, formats, codes and conventions that are used in preparing the plans
8. the main planning methods and techniques in use, and what problems could occur in them
9. the factors to be taken into account when preparing the plans, especially those covering working conditions and safety
10. the main types of resources involved with different types of engineering activity, and the typical timescales for providing them
11. the obvious (and hidden) costs of resources/activities
12. the normal timescales for carrying out specific engineering activities, and how and why they vary
13. the products (or assets) involved in the activity being planned, and their availability
14. the engineering activities associated with these products/assets, and the types of data relevant to them
15. the development of the engineering plans (to include both master documents and working instructions, along with their purpose, content and status)
16. how to prepare the plans (to include the structure, style, clarity and compliance with relevant standards)

17. the process used in the organisation to validate the plans produced
18. the control procedure for ensuring that the plans are maintained up to date
19. the procedures for changing the plans, and why control procedures are used
20. the importance of maintaining records; what needs to be recorded and where records are kept
21. why contingency plans need to be drawn up
22. who to inform about the plans
23. the different ways of presenting information to different people
24. the importance of providing the right information at the right time
25. the roles and responsibilities of key personnel in your organisation
26. problems that can occur during the implementation of the plan, and how these problems can be rectified
27. the extent of your own authority, and whom you should report to in the event of problems that you cannot resolve
28. the sources of technical expertise if you have problems you cannot resolve
29.

the organisational procedures for providing information to different people

Scope/range

1.

Carry out all of the following when determining and producing the engineering plans:

1.1 use the correct issue of company information
1.2 check that all essential information and data needed to produce the plans is available
1.3 collect relevant information on the engineering requirements, operations, methods and resources
1.4 determine the availability of resources required
1.5 ensure that the activities to be carried out fall within budget constraints
1.6 ensure that health and safety regulations and safe working practices are taken into account
1.7 ensure that the influence of working conditions is recognised and included in the plans
1.8 resolve any problems as they occur, within your level of responsibility
1.9 present the engineering plans in the appropriate formats

2.

Produce engineering plans for one of the following:

2.1 drawing/design activities (such as mechanical, electrical/electronic, motor vehicle, aerospace, marine)
2.2 manufacturing activities (such as machining, detail fitting, fabrication of components, pressing, implant, photolithography)
2.3 material processing activities (such as heat treatment, casting, injection moulding, purification)
2.4 composite manufacture (such as wet lay-up, pre-preg laminating, resin infusion, blow moulding)
2.5 finishing activities (such as stripping finishes, painting, plating, anodising, veneering, lacquering, etching, deposition, polishing, inking)
2.6 assembly activities (such as mechanical, structural, fluid power, electrical/electronic, woodworking)
2.7 installation activities (such as mechanical, electrical/electronic, avionic, structural, environmental equipment)
2.8 plant and equipment (such as site preparation, plant layout, equipment changeover, equipment replacement)
2.9 equipment capability studies/performance measurement
2.10 movement of materials, components or finished goods
2.11 engineering safety audits or risk assessments
2.12 business improvement activities
2.13 quality control/quality assurance
2.14 maintenance activities
2.15 modification and repair activities
2.16 commissioning/decommissioning
2.17 testing and trialling
2.18 research and development

2.19 engineering support services

3.

Prepare plans that include details for six of the following:

3.1 description of the activities to be carried out
3.2 the sequence in which the activities will take place
3.3 the documentation to be used (such as drawings, specifications, quality assurance, surveys, electronic specifications)
3.4 people required who have the necessary skills and knowledge
3.5 the raw materials required (such as type of material, form of material, amount of material)
3.6 consumable materials required (such as welding accessories, masking mediums, lubricants, chemicals)
3.7 bought-in standard components (such as bearings, electrical or electronic components, fluid power components, mechanical fasteners)
3.8 equipment required (such as hand tools, power tools, machinery, lifting and handling equipment)
3.9 measuring or test equipment (such as mechanical measuring, electrical measuring)
3.10 any outside support services required (such as material treatments, specialist lifting and moving equipment)
3.11 any special environmental/legislative requirements that must be met
3.12 special/specific safety equipment required (such as fume extraction, fire equipment)
3.13 space required
3.14 financial considerations
3.15 timescales to be met
3.16 utilities required

4.

Carry out all of the following on completion of the planning activities:

4.1 validation and evaluation of the planning systems and procedures used
4.2 suggested improvements to your process of planning
4.3 recommendations for improvements or changes to the engineering activities that were planned

5.

Ensure that the plans include any relevant regulations, standards and guidelines from one of the following:

5.1 organisational guidelines and codes of practice
5.2 customer standards and requirements
5.3 equipment manufacturer's operation specification/range
5.4 BS and/or ISO standards
5.5 health, safety and environmental requirements
5.6 recognised compliance agency/body's standards

6.

Record and present the plans to the appropriate people, using the following methods:

6.1 specific organisation documentation

Plus one more method from the following:

2. written or typed report
3. verbal report
4. electronic mail
5. computer based presentation

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