SEMEM409

Evaluate engineering designs

Overview

This standard identifies the competences you need to evaluate engineering designs, in accordance with approved procedures. You will be required to plan the most effective way to evaluate the design, to establish the criteria for evaluation, and to obtain relevant information from the appropriate sources. You will then present the results of the evaluation, together with any recommendations, to the appropriate people.

Your responsibilities will require you to comply with organisational policy and procedures for carrying out the evaluation process, and to report any problems that you cannot personally resolve to the relevant authority. You will be expected to work unsupervised, either on your own or as part of a team, which you may lead or direct, taking full responsibility for your actions, and possibly for the work of colleagues or subordinates.

Your underpinning knowledge will provide a good understanding of general and discipline-specific engineering principles and processes. You will be fully conversant with organisational procedures and systems, and with the methods of evaluation. You will also be able to use various presentation methods for conveying results and recommendations.

You will be fully aware of any health, safety and environmental requirements, and the appropriate legislative and regulatory frameworks applicable to your area of responsibility. You will be required to ensure that safe working practices are maintained 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 and other relevant regulations, directives and guidelines
2. plan the most appropriate way for evaluating the design of the engineering product or process
3. establish clear and precise criteria for evaluating the designs
4. obtain accurate information on the designs from all valid sources
5. verify the designs by using the most appropriate methods
6. assess the designs against the evaluation criteria
7. highlight the strengths and weaknesses of the designs
8. identify the designs that are the most effective at meeting the client's requirements
9. present the results of the evaluation to the appropriate people according to agreed procedures
10. recommend options for the designs

Knowledge and understanding

You need to know and understand:

1. the various methods that are used for evaluating designs
2. how to select the most appropriate evaluation method
3. the evaluation criteria that could be used for different types of design
4. how to obtain the different types of design information
5. where to obtain the design information
6. who should be involved in the evaluation process
7. how to determine what additional resources may be required for the evaluation process
8. how to obtain additional resources
9. the methods that could be used for verifying different types of result
10. the type of impact the evaluation could have on the organisation
11. who requires information on evaluations, and the procedures for informing them
12. the types of recommendation that could emerge from evaluations
13. how to present recommendations, and the various ways in which this can be achieved
14. the extent of your own responsibility, and to whom you should report if you have problems that you cannot resolve

Scope/range related to performance criteria

1.

Carry out **all** of the following activities when evaluating the design:

1.1 plan the most appropriate way to evaluate the design
1.2 obtain clear criteria on which to base the evaluation
1.3 obtain the necessary information from the appropriate sources
1.4 evaluate the design against the established criteria, using appropriate evaluation methods
1.5 make recommendations on various design options, and communicate the results of the evaluation to the appropriate people

2.

Establish the criteria for evaluating the design, considering **twelve** of the following:

2.1 function
2.2 financial constraints
2.3 manufacturing requirements
2.4 installation or commissioning requirements
2.5 building redundancy into the design
2.6 appropriate materials
2.7 technology
2.8 aesthetics
2.9 performance/capability
2.10 reliability
2.11 life cycle of product, system or process
2.12 servicing, maintenance or repair
2.13 product features
2.14 availability of resources
2.15 characteristics
2.16 corporate branding
2.17 components or systems to be used
2.18 functional requirements
2.19 any interface requirements
2.20 future client support
2.21 timescales
2.22 diversity/alternatives
2.23 safety
2.24 environmental and sustainability factors
2.25 other specific criteria

3.

Obtain information to assist the evaluation, from the design brief to include **two** of the following:

3.1 design options created
3.2 design presentations

3.3 any previous modelling/mock ups or simulations
3.4 equipment manufacturers
3.5 technical specialists
3.6 design documentation
3.7 general or specialised media
3.8 colleagues
3.9 suppliers
3.10 consultation/research data
3.11 operational staff/users
3.12 the client/customer

4.

Evaluate engineering designs, using:

4.1 analysis of the design documentation

plus **one** of the following:

2. simulation
3. pilot trial/test
4. prototype assessment
5. small-scale production
6. model/mock-up
7. software simulation/modelling
8. consultation/market research

1.

Evaluate **all** of the following in engineering designs:

1.1 performance against design criteria
1.2 options for improvement
1.3 how effectively they meet the design brief
1.4 conformity with organisational/ industry standards, directives or codes of practice
1.5 advantages/disadvantages
1.6 conformity with relevant health, safety and environmental standards

2.

Present the results of the evaluation, and your recommendations, to **two** of the following:

2.1 the design team
2.2 the client
2.3 colleagues
2.4 other stakeholders

Behaviours

Additional Information

You will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as:

- strong work ethic
- positive attitude
- team player
- dependability
- responsibility
- honesty
- integrity
- motivation
- commitment

SEMEM409

Evaluate engineering designs

Developed by	Enginuity
Version Number	3
Date Approved	30 Mar 2017
Indicative Review Date	31 Mar 2020
Validity	Current
Status	Original
Originating Organisation	Semta
Original URN	SEMEM4-09
Relevant Occupations	Corporate Managers and Senior Officials, Engineering, Engineering and Manufacturing Technologies, Functional Managers
Suite	Engineering and Manufacture Suite 4
Keywords	Engineering; leading; design; process; maintenance; quality; customer; function; features; objectives; manufacturing; installation; commissioning; testing; carrying out; problems; specifications; quality; research; evaluate