SEMEM430

Investigate incidents relating to engineering activities

Overview

This standard identifies the competences you need to carry out an investigation of incidents relating to engineering activities, in accordance with approved procedures. You will be required to obtain evidence and information, to identify the potential cause(s), and to recommend improvements to the affected engineering activities. You will also be expected to communicate the outcome of the investigation, in the most appropriate manner, to the relevant people.

Your responsibilities will require you to comply with organisational policy and procedures for investigating incidents, 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. You will have a substantial knowledge of risk analysis and assessment and, in particular, the techniques and procedures for investigating and reporting accidents or `near misses'. This knowledge will allow you to take an informed approach to carrying out such investigations, to resolve related problems and to make sound decisions.

You will be familiar with various presentation and communication methods, and will know how to choose the appropriate ones to use for different target audiences.

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 investigating the incident
3. obtain sufficient relevant and accurate information from valid sources relating to the incident
4. identify the potential causes of the incident
5. evaluate all relevant information relating to the incident
6. specify the contributory factors that led to the incident
7. provide clear and justifiable conclusions on the causes of the incident
8. recommend improvements to the engineering product or process associated with the incident
9. record and present the results of the investigation to the appropriate people

Knowledge and understanding

You need to know and understand:

1. the engineering activities within your organisation where incidents could occur
2. the types of incident that could occur
3. the factors that should be taken into account when planning an investigation
4. how to prepare an investigation plan, and the appropriate company format to use
5. the methods that could be used for obtaining information on an incident
6. the valid and relevant sources if information to use when investigating incidents
7. the amount of information that should be collected
8. the methods that are available for evaluating information on incidents
9. the potential contributory factors to consider when determining the cause of incidents
10. how to assess the impact of each of the different contributory factors
11. the importance of providing clear and justifiable conclusions on the causes of an incident
12. the type and amount of evidence necessary to support your conclusions
13. the type of impact the investigation could have on the organisation
14. who requires the information, and the procedures for informing them
15. how to instigate training, special instructions or procedures as a result of incident investigations
16. the types of recommendation that could emerge from an investigation
17. methods for error proofing or mistake proofing (such as Poke Yoke)
18. how to present your recommendations
19. 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.

Investigate incidents related to **three** of the following engineering activities:

1.1 production activities (such as processing materials, fabrication, finishing, assembly, joining)
1.2 installation activities (such as commissioning/decommissioning, site preparation, equipment installation)
1.3 operational activities (such as movement of materials, quality systems and audit, scheduled safety audits and risk assessments)
1.4 maintenance activities (such as planned preventive maintenance (PPM), part or sub-assembly exchange, breakdown response maintenance records systems, line setting)
1.5 design and research

2.

Produce an investigation plan that includes **all** of the following:

2.1 the (possible) severity of an injury
2.2 who will carry out the investigation
2.3 the damage to equipment
2.4 estimated cost of the investigation
2.5 potential business loss
2.6 ethical considerations
2.7 community (public) opinion
2.8 the nature of the incident potential
2.9 employee concerns
2.10 involvement of emergency services
2.11 mandatory responsibilities
2.12 staff representation
2.13 breach of health and safety
2.14 the immediate process effect
2.15 legal implications
2.16 equipment supplier (such as responsibilities, implications)

3.

Gather and evaluate information using **five** of the following sources:

3.1 cctv or photographic evidence
3.2 personnel records
3.3 material or substance data sheets
3.4 legislative information
3.5 health and safety executive accident statistics
3.6 re-enactment
3.7 shift reports
3.8 site history of incidents and `near misses'
3.9 incident reports

3.10 dangerous occurrence reports
3.11 maintenance history
3.12 process change records
3.13 operational procedures
3.14 drawings or diagrams
3.15 equipment detail
3.16 expert statements
3.17 witness statements

4.

Consider **all** of the following when investigating the possible cause of the incident:

4.1 workplace environment (such as housekeeping, activities, products and materials)
4.2 management quality (such as supervision, policy, discipline)
4.3 work hours (such as overtime, shift patterns)
4.4 nature of the incident (such as an explosion, gas discharge or hot metal discharge)
4.5 equipment (such as ergonomics, malfunction or a safety function failure)
4.6 skill levels (such as competence, instruction, training)
4.7 human related (such as deliberate misconduct, sabotage, error of judgement or fatigue)
4.8 other specific factor

5.

Consider **all** of the following when identifying contributory factors that led to the incident:

5.1 care and welfare of employees
5.2 maintenance
5.3 discipline
5.4 general conditions and facilities
5.5 level of supervision
5.6 work demands
5.7 skills, experience and knowledge
5.8 housekeeping
5.9 stress
5.10 use of direct or indirect labour
5.11 morale
5.12 provisions and aids

6.

Review **all** of the following information during an investigation:

6.1 health and safety standards
6.2 extent of any injuries and their affects
6.3 events leading up to and associated with the incident
6.4 post incident risk prevention recommendations
6.5 foreseeable and preventative incident risk conjecture
6.6 actual and potential effect of an incident
6.7 actual immediate incident management

6.8 improvements to the engineering activity
6.9 responsibilities
6.10 equipment damage
6.11 contributory factors
6.12 business cost
6.13 time lost
6.14 role of the emergency services
6.15 the (likely) cause(s)

7. Record and communicate the results of the investigation to the appropriate people, using:

7.1 a verbal report

plus **one** from the following:

2. electronic mail
3. computer-based presentation
4. computer generated report
5. specific company document
6. other appropriate media

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

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