

## Applying failure modes and effects analysis (FMEA)

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### Overview

This standard covers the competences required for applying failure modes and effects analysis (FMEA). It involves applying the principles and processes of FMEA and determining the key features of FMEA required for the activity under investigation. The activities will include concepts, designs, systems, products, processes and machines.

You will be required to determine the key features of FMEA, co-ordinating and recording the information gathered in an appropriate format, and to make valid judgements about the activity, using FMEA principles. This will include calculating risk priority numbers (RPNs), identifying high RPNs and developing actions to improve them. Once actions have been completed, you will need to reassess the activity and re-score severity, occurrence and detection.

Your responsibilities will require you to comply with organisational policy and procedures for the activities undertaken, and to report any problems with the activities that you cannot solve, or that are outside your responsibility, to the relevant authority. You will need to ensure that all the necessary documentation is completed accurately and legibly. You will be expected to take full responsibility for your own actions within the activity, and for the quality and accuracy of the work that you produce.

Your underpinning knowledge will provide a good understanding of FMEA, and will provide an informed approach to the techniques and procedures used. You will need to understand the principles and application of FMEA, in adequate depth to provide a sound basis for carrying out the activities to the required criteria.

Applying safe working practices will be a key issue throughout.

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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. determine the key features of failure modes and effects analysis (FMEA) required for the activity under investigation
3. co-ordinate and produce a failure modes and effects analysis
4. record the information gathered in an appropriate format
5. make valid judgements about the activity using failure modes and effects analysis principles
6. calculate risk priority numbers (RPNs), identify high RPNs, and develop actions to improve them
7. reassess FMEA once actions have been completed, and re-score severity, occurrence and detection

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### Knowledge and understanding

#### You need to know and understand:

1. how to work safely at all times, complying with health and safety and other relevant regulations, directives and guidelines
2. the main features and benefits of carrying out a failure modes and effects analysis
3. who should be part of a team that constructs and updates a failure modes and effects analysis
4. system FMEA, Concept FMEA, Design FMEA and Process FMEA - what they are, and where you should use them
5. the meaning of failure mode, failure effect and failure cause
6. the rating scale used in failure modes and effects analysis projects, to include the severity rating scale, the occurrence rating scale and the detection rating scale
7. how to calculate a risk priority number (RPN)
8. how to use the risk priority numbers
9. how to apply a structured approach to risk reduction
10. when to start a failure modes and effects analysis
11. when to update a failure modes and effects analysis
12. the roles and responsibilities of individuals within a failure modes and effects analysis team
13. the extent of your own authority within the project, and to whom you should report in the event of problems that you cannot resolve

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### Scope/range related to performance criteria

1. Carry out a failure modes and effects analysis on **two** of the following:
  1. concept
  2. product
  3. design
  4. process
  5. system
  6. machine
2. Identify, for the activities analysed above **all** the following:
  1. the potential failure modes
  2. the potential effects from failure modes
  3. the potential causes of failure modes
3. Establish rating tables for **all** of the following:
  1. occurrence
  2. severity
  3. detection
4. Identify and score **all** of the following:
  1. the likely occurrence of a potential failure modes
  2. the severity of the potential failure modes
  3. the likelihood of detection of the potential failure modes

## Applying failure modes and effects analysis (FMEA)

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