

# Failure Mode and Effects Analysis

When designing products and processes it is necessary to take into consideration the possibility of failure and either take action to eliminate the cause or minimise the effects.

FMEA is basically a preventive action technique for assessing risks and defining action to eliminate, reduce and contain potential modes of failure. FMEA has the following features

- Performed during product/process development stage
- Also performed when seeking any subsequent improvement
- Identifies what could go wrong
- Records the effects of potential failure
- Ranks the severity of failure effects and so serves to prioritise action
- Records the cause of failure and the frequency of occurrence
- Identifies existing controls to prevent or detect the cause and their probability of detecting, containing or eliminating failure
- Computes a Risk Priority Number (Severity x Occurrence x Detection)
- Records additional actions needed to reduce the risk (e.g. risk can be reduced by increasing probability of detection while decreasing severity and probability of occurrence)
- Records responsibility for action
- Used to track results of actions taken

Typical problems that arise in the use of FMEA are

- The recommendations are not acted upon
- The analysis is performed too late and results in it being a record of the status quo and not an aid to improvement
- Often treated as a tick in the box – We've done an FMEA rather than we have improved the product/process design
- The rankings are subjective and inject bias
- The analysis is not performed by the designer and thus does not drive the design
- The analysis is not repeated when changes are made
- The analysis is not used when actual failures occur to discover why they were not detected
- It is only used when required by contract and not as a useful tool for risk reduction

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