Waterford Institute of Technology

RIKON DIFFERENTTHINKSBETTER

Failure Mode Effects Analysis (FMEA)

FMEA is a brainstorming exercise that emerged from quality management with the purpose of identifying the greatest number of potential failures within a product or process, in order to take actions through which they can be eliminated or reduced. The underpinning rationale of the approach is that problems identified earlier in a development cycle are easier and less expensive to resolve. Potential failures are prioritised on 3 dimensions: (1) the seriousness of consequences, (2) frequency of occurrence, and (3) detectability.

Using 'Failure Mode Effects Analysis (FMEA)'

Step 1: Agree, within the analysis group comprised of members from various knowledge domains, the boundaries of the product or process that is being developed. The product or process is deconstructed into its constituent phases or characteristics, for which the following steps are executed.

Step 2: Identify 'failure modes' by questioning what could go wrong or contemplating worst case scenarios.

Step 3: Diagnose the root causes of these failures.

Step 4: Specify the effects or consequences of these failures.

Step 5: Prioritise the criticality of these failures on the basis of their effects.

Step 6: Brainstorm potential responses to these failures. This may be accomplished through an adaptation of the design or through the creation of contingency plans.

Stage / characteristic	Failure	Consequence(s)	Severity of impact	Potential cause(s)	Likelihood of occurrence	Control(s)
Stage of the process, or characteristic of the product in which the failure might take place is identified.	*Different ways in which failure could take place during this stage or within this characteristic are identified.*	*The consequences of these failures happening are determined.*	*The severity of the consequences are indicated e.g. on a scale from 1 to 5.*	*The root causes of potential failures are summarised.*	*The likelihood of occurrence is indicated e.g. on a scale from 1 to 5.*	*Methods are described through which failures may be detected, monitored, controlled, and their impact minimised.*