

# Failure Mode and Effect Analysis (FMEA)

## Assessing the risks in the process manufacturing environment

### Course Overview

#### How You Will Benefit

FMEA is a procedure for determining where processes, products or designs are most likely to fail and why. It is used to design a process, [review and improve a process](#) and also act as an efficient process control. Its step-by-step approach identifies each failure mode, with the analysis then estimating the effects of failure and devising ways of controlling the process so that failure can be averted.

It is a logical, structured way to identify areas of concern while reducing development time and cost. It's also valuable when the intent is to apply a particular (typically successful) process of one product or service to another. It has proven to be an effective way to identify how to improve areas where performance might be lagging. FMEA has become integral to any production process and is widely considered an improvement over traditional risk analysis, which treats each potential failure in isolation.

#### Benefits of Utilizing the 5 Principles

Applying FMEA in your organization will:

- Provide a systematic approach that formalizes the mental discipline an engineer goes through in the manufacturing planning process
- Identifies any potential product related process failure modes
- Assesses the potential customer effects of the failures
- Identifies potential manufacturing and/or process failure causes
- Identifies significant process variables to focus control for occurrence reduction and detection of failure modes
- Develops a list of potential failure modes ranked according to the effect on the customer, thus establishing a priority system for corrective and preventive action considerations

#### Course Objectives

At the completion of this module participants will increase their ability to:

- Participate actively in the creation of a FMEA
- Learn and apply the block method in creating a FMEA
- Identify potential failure modes and evaluate the effects on customers
- Quantify the occurrence of the failure modes and identify current controls
- Establish the criteria for taking actions
- Develop a practical example of a Process FMEA
- Relate elements of the FMEA to the PQCT
- Create elements of a PQCT

#### Key Topics Covered

This course explores the following subjects in depth:

- The Deming approach to quality
- Process planning roadmap and the quality triangle
- FMEA history and introduction
- Failure modes and effects severity rankings
- Prevention controls and occurrence rankings
- Concept of variation
- Failure mode and cause – detection rankings
- Prevention controls versus detection controls
- Understanding and calculating Risk Priority Number (RPN)
- Elements of the Parts Quality Control Table (PQCT)
- Block methodology for creating FMEA's
- Identify effects and ranking them
- Determining cause(s) of failure modes
- Occurrence, Prevention and Detection controls

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### What the Course Offers

- Experiential learning setting
- Opportunity to learn from others while applying the concepts in a risk-free environment
- Complete set of materials including participant guide, classroom videos and current version (4<sup>th</sup> edition) of the AIAG FMEA reference manual