3-day Failure Modes and Effects Analysis Workshop

Workshop Description

The use of Failure Mode and Effect Analysis (FMEA), in all its incarnations, is almost ubiquitous throughout industry, yet its deployment and application are often fraught with difficulties. What appears to be a simple tool is often used inconsistently with a corresponding high degree of frustration and lack of confidence. Part of the problem lies with the published work and the standards on this fundamentally simple tool as they demonstrate a distinct degree of inconsistency.

The FMEA workshop uses a systems approach to failure to provide practicing engineers with a consistent and clear understanding of the relationships between failure modes, mechanisms, effects and causes. In practice, this systems model provides an unambiguous, repeatable and reproducible approach to FMEA whether it is Functional, Design, Use or Process. The use of Functional FMEA is also unique and presents a powerful but earlier form of FMEA as a precursor to a Design FMEA, Use FMEA and Process FMEA. The intent of Functional FMEA is to identify issues before design commences such that they can be designed out ab initio.

The 3-day FMEA Workshop has three purposes:

- To educate and train attendees in the concepts, principles and practices of Failure Modes and Effects Analysis.
- To develop attendees' skills to successfully conduct real-world FMEAs.
- To develop attendees' skills in facilitating FMEA workshops.

Wherever possible the workshop will apply the various forms of FMEA to real-world practice examples selected and agreed beforehand.

Course Numbers and Who Should Attend?

The 3-day FMEA workshop can be delivered to up to 20 participants working in small teams of 4/5

Benefits to the Individual and Business

At the end of the workshop attendees will:

- Have an understanding of the concepts and principles of systems approach to failure and how they apply to the consistent identification of potential failure modes, effects mechanisms and causes
- Have understanding and confidence to successfully conduct Functional FMEA, Design FMEA and Use/ Process FMEA
- Understand the role of facilitation in constructing an FMEA and be able to plan an FMEA Workshop.

As a consequence of the learning the business will:

- Greater in-house capability and understanding to conduct FMEAs consistently and correctly
- Less product change and greater product stability.

Learning Approach

The learning approach is based on the Kolb learning cycle with a proportion of the workshop set aside for exercises to reinforce the learning. Indeed, many of the small group exercises involve a real case study provides by the client organization to provide practical focus for the workshop and enables the delegates to practise the methodology and tools presented.

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Workshop Agenda

Day 1 Theory	Day 2 FMEA Practice	Day 3 FMEA Practice

Introduction and expectations
Risk the reason for FMEA
• Risk vs. Uncertainty
• FMEA and safety
What is FMEA
• A systems Approach to Failure
  ◦ Failure definition
  ◦ Function
  ◦ Failure mode
  ◦ Effects
  ◦ Causes
  ◦ Failure mechanisms
Tyoes of FMEA
• Functional FMEA
• Design FMEA
• Process FMEA
• Software FMEA
FMEA Processes—How to:
• Identify functions
• Define failure modes
• Defining effects
• Assigning Severity
• Understanding Causes, mechanisms and symptoms
• Assigning Occurrence
• Preventions and detection methods in place
• Assigning Prevention-Detection
• Understanding Risk Priority Numbers
• Identifying mitigation actions
• Evaluation of actions
	Review of FMEA process FMEA in practice
	• Team-based FMEA
	• Planning and organisation FMEA
	• Managing FMEA information
	Functional FMEA during Design
	• Requirements-> Functions -> Solutions
	• Identifying Functions
	• Functional FMEA process
	Practice Session 1: Functional FMEA
	Review of Session 1 and lesson learnt
	Design FMEA after Design
	• Defending the scope
	• Finding the functions
	• Design FMEA process
	• Practice Examples
	Practice Session 2: Design FMEA
	Review of Session 2 and lesson learnt
	• Supporting tools for F & DFMEA
	  ◦ Context Diagram
	  ◦ Parameter Diagrams
	  ◦ Functional Analysis
	  ◦ Functional Models
		Facilitating an FMEA Session
		• Planning
		• Managing people
		• Managing time
		Use/Process FMEA
		• Use/Process FMEA Process
		• Use/Process Steps -> Functions
		  ◦ How to do it
		  ◦ Practice examples
		• Interventions
		  ◦ Change the design
		  ◦ Poke Yoke
		  ◦ Process Controls
		Practice Session 3: Use/Process FMEA
		Review of Session 3 and lesson learnt
		• Supporting Tools for UPFMEA
		  ◦ Process Map
		  ◦ Sequence Diagram
		  ◦ Workflow Analysis
		Planning FMEA Sessions
		• Planning Process
		  ◦ People
		  ◦ Facilities
		  ◦ Timing
		Summary and Close

Practice Examples and Post Training Activity

It is recommended that days 2 and 3 use real practice examples from the attendees' workplace. The workshop activity will not complete the various FMEAs, but attendees can be requested to complete the practice FMEA as an after-training activity.

Workshop Costs

The cost of delivering the 3-day Workshop, excluding delivery tutor accommodation and expenses, but including all courseware and support to determine suitable practice examples is £4,800. VAT will apply at the prevailing rate.

The course can be tailored to suit individual customer's operations.

More Information and Contact Details

For more information about the 3-day FMEA Workshop or any of our other Systems Engineering courses please contact **Dr Stuart Burge** on +44 (0)7803 131614 or sburge@burgehugheswalsh.co.uk.

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