
AS13004 Workshop

Process Flow Diagram (PFD), Process Failure Mode and Effects Analysis (PFMEA), Process Control Plan (PCP)

Overview and Purpose

This 2-day workshop will provide you with fundamental knowledge and hands-on practice with the AS13004 requirements for aviation and aerospace manufacturers and suppliers regarding the expected content, execution, strategies, methodologies, and linkage of Process Flow Diagrams, Process FMEAs, and Process Control Plans. This program has been specially designed for product, manufacturing, quality, and supplier personnel within the aviation industry extended enterprise, including a special focus on developing supplier understanding and capabilities.

Why all three topics together?

AS9145 and AS13004 require that PFDs, PFMEAs, and Control Plans be developed and maintained in an integrated fashion. Training that focuses only on one of these subjects at a time cannot show how these tools work together to focus on critical product and process characteristics, minimize effort, maximize effectiveness, improve quality, and complete programs more quickly with less headaches before, during, and after launch. Participants apply these key tools together during the workshop on their own products and processes.

Here are some of the things that you'll learn:

- The purpose and focus of these tools for aerospace products, processes, and suppliers to achieve zero escapes and MRBs.
- The relationship between engineering drawings and requirements and PFDs, FMEAs, and Control Plans.
- How to ensure proper focus and scope during execution.
- How to complete the documents in a timely fashion to achieve optimal results.
- Step-by-step instructions for completing PFDs, PFMEAs, and Control Plans.
- How to avoid some of the most common Process FMEA pitfalls.
- How to customize severity and detection rankings to streamline the PFMEA process.
- How to use process family document strategies to minimize wasted time and effort.

Pre-work

- Pre-Assessment
- Preparation for the Application Exercise: What to Bring to Class
- Document Linkage Overview

Day 1

Introduction

- Review of Pre-Assessment Questions and Answers
- Document Drivers and Linkage Review
- Workshop Objectives and Expectations
- AS13004 Overview, Expectations, and Deliverables

Process Flow Diagram (PFD)

- Instructor-led development of a sample PFD
- High-Level PFD and High-Level Risk Analysis
- Detailed PFD definition, questions, purpose, and benefits
- Components of a thorough PFD
- Product Characteristics (Outputs) and Process Characteristics (Inputs)
- Setup/Verify; Select/Obtain; Fab/Assemble; Inspect/Gage; Review/Rework/Scrap; Move/Store
- Changeover and other Hidden Factory Elements
- Proper sequence for completing the PFD, including best practices
- PFD small group exercises

Process FMEA Introduction

- Instructor-led development of a sample PFMEA
- FMEA definition, questions, purpose, and benefits
- Types of FMEAs, their focus, and their relationship with GE Aviation products and process
- Timing of FMEA development and revisions
- FMEA team composition and data inputs

Process FMEA Development

- PFMEA Candidates, Triggers, Timing, and Inputs
- Process Requirements, Failure Mode, and PFMEA Assumptions
- Types of Requirements and how to prioritize requirements
- Typical types of Failure Modes
- Effects in terms of End User, Customer Plant, or Internal Manufacturing Impact
- Severity: How to properly rank severity using objective criteria
- Causes: Known causes versus possible causes
- How to properly list causes or mechanism of failure
- How to include human factors related causes of failure
- Occurrence: Likelihood of failure for known causes versus possible causes
- How to assess occurrence for new products or processes
- How to properly apply AS13004 occurrence ranking options
- Current Prevention Controls, typical types and rankings
- Current Detection Controls, typical types and rankings
- How to categorize and rank poka-yoke and mistake proofing interventions
- Risk Priority Number: Proper RPN Calculation
- Pareto-based Prioritization Strategies
- Recommended Actions: 4 typical types of recommended actions
- Follow-up and capturing lessons-learned on the PFMEA

Day 2

Process Control Plans (PCP) Development

- Instructor-led development of a sample PFMEA
- Purpose and Inputs
- Step-by-step Approach to Control Plan Developed
- Control Plan Inputs
- Operation Description, Characteristics, and Control Methods
- Product Characteristics and Related Process Characteristics
- Determining Sources of Variation
- Table of Controls
- Evaluation Methods/Measurement Technique
- Sample Size/Frequency
- Reaction Plans Targeting the Product and Process

PFD PFMEA and PCP Application Exercise

- Conduct PFD, PFMEA, and PCP application on target product and process
- Group Presentations
- Instructor and Participant Assessment and Feedback

Summary

- Next Steps for Implementation
- Additional Resources and Training
- Follow-up Support
- Participant-led workshop review
- Post Assessment
- Workshop Evaluation