



# Advanced PFMEA Application for Manufacturing (AIAG-VDA New Edition PFMEA)

## FMEA is only paper work?

- “FMEA is just Paper Work, we can not see any use for quality improvement except for showing auditors”
  - “We have more than hundreds of FMEA sheets, but same problems occur again and again!”
  - “We have been trained numerous times for FMEA, but our engineers still looks at FMEA as extra burden, what’s problem?”
  - “I’ve heard many top companies regard FMEA as top secret. But our FMEA is cooked up by our engineers, we can not see why should it be secret? How to manage and accumulate our knowledge with FMEA?”
  - “The field problems are most due to design reason. We are always fire fighter, but fire comes out any time anywhere. If we can correct happened problems, how could we prevent potential failures?”
  - “How to integrate FMEA with design process and kill the failure in the early stage, and implement FMEA as tools instead of burdens.”
  - “Our engineers actually want to develop FMEA, but always alone without any support. How to transfer FMEA job to Team Work?”
  - “How to build up the FMEA culture, and build FMEA methodology into the working habit of each engineers?”
- .....

**If you are experiencing above pains, please contact us right away ! We will help:**  
**FMEA breakthrough solution !**  
**FMEA dramatical Improvement !**

## Your Trustable FMEA Professionals!

### What are the benefits?

#### **Emphasize practical application**

Using customer on-site product for FMEA teaching, ensure every participant fully understand how to develop high value-added FMEA

#### **Rich experience of consultant**

The professional consultant have rich FMEA experience in vehicle/system/subsystem of GM, Samsung and Philips

#### **Target at key issues**

Using customer’s current FMEA files for problem analysis, and develop the improvement planning combined with customer design process

#### **Innovative Content**

Most illustrative explanation from FMEA professionals, which are the key writing committee of AIAG-VDA new FMEA manual

#### **FMEA is process**

Easy operational VBA-FMEA template for engineers application in their daily work.

### Who should attend?

Design Engineer, Procoss Engineer, Industry Engineer, QA/QC, SQE, Design Engineer  
 Process/ Design/Quality Strategy Management  
 Production/Design/Tech. Director or Manager  
 Product Manager, Project Manager

### Tips

- ✓ **Directly use Your Product to conduct FMEA practices in the workshop!**
- ✓ **This course target at FMEA impovement and application for engineers to add value to FMEA process.**
- ✓ **Note: On-site training with FMEA project consulting !**

## **Training purpose:**

- 1 According to the latest FMEA requirements issued by AIAG-VDA, combined with rich practical application cases (production process actually in the charge of trainees), explain the content, requirements, internal logic, implementation steps and methods of FMEA.
- 2 It includes AIAG-VDA FMEA form, internal logic and filling requirements, structure analysis, function analysis, correlation between FMEA of different quality processes, previous failure mode investigation and transfer and implementation of special characteristics in FMEA.
- 3 Teach how to use FMEA as a quality tool in the process of new product process development; And the ideas, steps, skills, verification and application methods of potential failure prevention in the aspects of continuous improvement of key process engineering of existing products.
- 4 Master the strategies of enterprises to promote FMEA, share best practices, learn how to apply FMEA for knowledge management, and form enterprise technology precipitation and long-term technical competitiveness.

## **Training characteristics**

- (1) Emphasis on practical application: it is promised to directly use the part product / Process Engineering (the production process actually in the charge of the trainees) for classroom FMEA practice and comment analysis, which can ensure that the trainees have the practical ability to independently write and develop their own high-quality FMEA after 2 days of training.
- (2) Advisory Teaching: it will be given by the consultant of the international top R&D center who has rich experience in the practical implementation and application of FMEA for vehicle and parts development, and answer questions and doubts in an open manner, so as to know and say everything about any relevant FMEA problems.
- (3) Highly targeted: systematically analyze the key problems existing in the implementation of FMEA, and put forward solutions and advice.
- (4) The content is novel: explain the latest AIAG-VDA FMEA improvement contents, such as SOD score, AP strategy and a variety of practical tools, methods and tables, which greatly improve the practical application level of engineers' FMEA.
- (5) FMEA awareness and culture run through: share the consultant's long-term best practice experience in implementing FMEA in the enterprise, integrate failure prevention into the engineer's awareness and daily habits, integrate it into the product development process, and rise to enterprise behavior for comprehensive failure prevention and knowledge management.

## **Implementation status of FMEA for failure prevention in Chinese Enterprises**

- Almost every quality consulting company will help customers with FMEA (potential failure mode and impact analysis) training programs. However, only a few cases have a happy ending. Even if the case is successfully closed, after being trained, more than half of the enterprises found that FMEA was like "chicken ribs" after doing it for a period of time!
- Almost every automobile industry or company involved in the automobile industry, whether vehicle manufacturers or parts suppliers, will require or be required to do FMEA (potential failure mode and impact analysis). However, few enterprises really benefit from it!
- According to the statistics of the "comprehensive survey on the application of quality tools", 89.4% of Chinese enterprises have not achieved good results in promoting FMEA!
- Therefore, so far, how to effectively prevent the failure of product design and manufacturing rather than "fire fighting" afterwards is still one of the most headache problems for enterprises.

In fact, there are two identification criteria for whether the enterprise FMEA has been successfully imported:

- Does FMEA help enterprises effectively prevent the failure of product design and manufacturing- Failure prevention!
- Does FMEA help enterprises carry out knowledge management to form technology precipitation and long-term technical competitiveness- Knowledge management!

To sum up, there are two root causes of PFMEA failure:

1、 FMEA is not closely combined with the enterprise's product development and manufacturing process, and the PFMEA that should have been prevented in advance has become a "paper article" for post exercise.

Typical symptoms: system "idling", FMEA "idling", problem "lighting"

The annual review of the enterprise quality system has been carried out every year. But the product quality problems of the enterprise still recur and suffer. PFMEA has been done for 4 ~ 5 years, and hundreds of copies are like waste paper. Failure prevention still depends on "natural brute force" without rules and regulations.

2、 Engineers do not really understand what PFMEA is and do not master the method of developing high-quality FMEA.

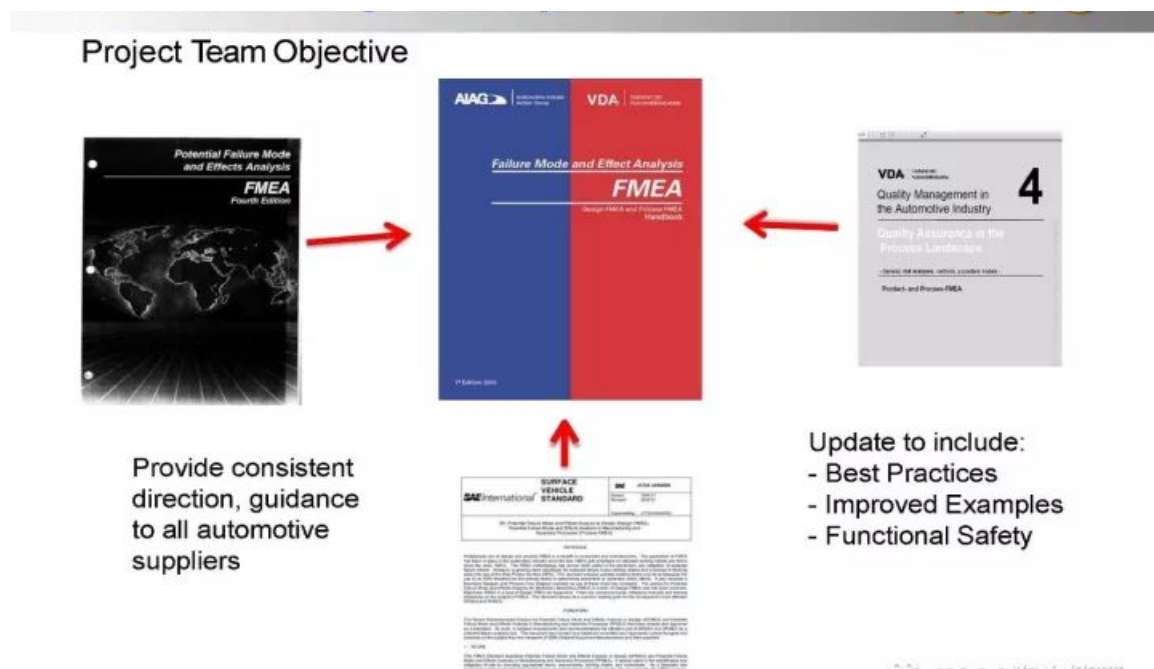
Typical symptom: after FMEA is finished, the engineer doesn't want to see it for the second time.

Because they did not understand the internal logical relationship of FMEA, blindly copied the FMEA manual template form, lacked the ideas and methods of PFMEA development, and simply relied on brainstorming to "crawl", the failure mode, consequences and causes were confused. In addition, the risk score was ambiguous. Such FMEA did not even want to see it for the second time. How can they hope for failure prevention?

Our FMEA consultant is an experienced person in the implementation of failure prevention FMEA in Chinese enterprises. We deeply understand and understand the difficulties and expectations of Chinese enterprises in implementing PFMEA. We refine and summarize the

advanced application of FMEA in manufacturing department for manufacturing process engineers based on many years of experience in enterprise consulting services. We adopt a highly interactive practical training method, and directly use the parts products designed by the trainees themselves (the production process actually in charge of the trainees) for classroom FMEA practice and comment analysis, so as to ensure that the trainees have the practical ability to independently write and develop their own high-quality FMEAs through the training.

## AIAG-VDA FMEA Main Update



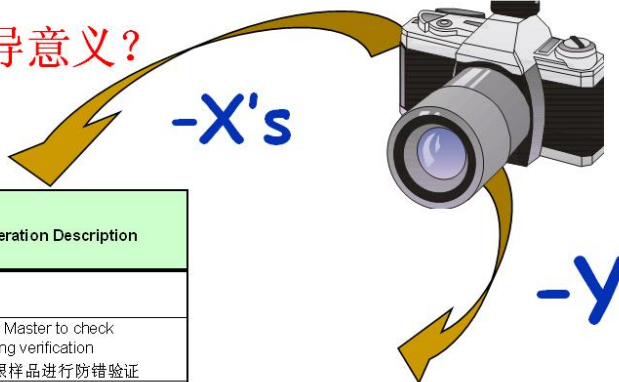
System Analysis			Failure Analysis & Risk Mitigation		Risk Communication	
<b>1<sup>st</sup></b> Step	<b>2<sup>nd</sup></b> Step	<b>3<sup>rd</sup></b> Step	<b>4<sup>th</sup></b> Step	<b>5<sup>th</sup></b> Step	<b>6<sup>th</sup></b> Step	<b>7<sup>th</sup></b> Step
Planning & Preparation	Structure Analysis	Function Analysis	Failure Analysis	Risk Analysis	Optimization	Results Documentation

### The Benefit:

The 7-step Approach is more structured, and highly instrumental in increasing a multidisciplinary team's effectiveness and efficiency:

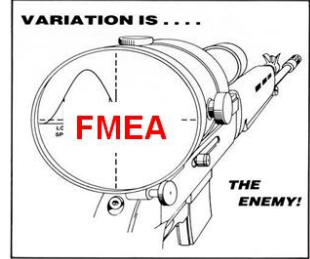
- More risks can be addressed in a comprehensive manner
- Multidisciplinary reviews of the FMEA become engaging “technical guided reflections” instead of an “unfocused brainstorm”, avoiding a discouragement attitude related to FMEA
- Enables senior management to comprehend and review necessary actions and resources to mitigate technical risks

# 为什么你的PFMEA对实际生产过程没有指导意义？



Op-Seq	Op-Sub	Op-Code	Op-Name	Op-Description
50-4			Get Reject Master to check errorproofing verification 不良板限样品进行防错验证	
50-5			Check Switch spring force and travel distance 检查开关弹簧力和行程	
50-6			Inspect for key-chain hole presence with photo-eyes 用红外安全电眼检查钥匙扣孔	
50-7			Rejects auto released from bottom of nest into reject chute. 不良品自动从工位底部推出落到不良品槽	
50-8			Place rejected Battery Housing Asm into reject box located behind station 把不良电池罩组件放入不良品箱子	
50-9			Store Reject Master part 保存不良板限样品	

过程散布要我来消灭!



**功能分Item/In**

Process Flow Diagram

1. 根据Process Flow过程流程图在横坐标中增加部件接口描述  
Add Interface Descriptions from Block Diagram in row.

2. 填入Y/N来表示Process过程是否影响功能  
Fill in Y/N to show whether or not Process affect function

Write to matrix 写入矩阵表

**示例SAMPLE**

过程Process	A-OP70涂蜡	B-OP80安装把手	C-OP90安装智能机
功能(要求) Functions(Requirements)			
1. 车门内部人工涂蜡(覆盖车门板内侧,下方涂蜡至指定厚度)	Y		
2. 将把手安装在车门上(把手与车门配合完好)		Y	
3. 将智能机安装在车门外(符合GCA要求)			Y

DSS Tool Box

To PFMEA | Group by Function

**Process FMEA**  
Potential Failure Mode and Effects Analysis

通过应用“转换矩阵项目 Transfer Matrix Items”功能单元把标识为Y的阴影单元格自动转入PFMEA页。  
By utilizing the "Transfer Matrix Items" Function only the shaded Yes cells are automatically transferred to the PFMEA sheet.

过程Process	功能(要求) Functions(Requirements)	A-OP70涂蜡	B-OP80安装把手	C-OP90安装智能机
1	车门内部人工涂蜡(覆盖车门板内侧,下方涂蜡至指定厚度)	Y		
2	将把手安装在车门上(把手与车门配合完好)		Y	
3	将智能机安装在车门外(符合GCA要求)			Y

**功能分析-过程功能矩阵 Process / Function Matrix**

Process Failure Mode and Effects

Line No.	过程步骤/功能(要求) Process Step / Function(Requirements)	潜在失效模式 Potential Failure Mode (Loss of Function or value to customer)	潜在失效后果 Potential Effects of Failure	严重度 S Severity	探测 D Detection	潜在失效原因机理 Potential Cause(s) / Mechanisms of Failure	现行过程控制预防 Current Process Controls Prevention
1	A-OP70涂蜡						
10	1. 车门内部人工涂蜡(覆盖车门板内侧,下方涂蜡至指定厚度)						
11	2. 将把手安装在车门上(把手与车门配合完好)						
12	3. 将智能机安装在车门外(符合GCA要求)						

过程和功能转入PFMEA分析页  
Item and Function are automatically transferred to the analysis page.

## Training Schedule (Day 1)

Day	Topics	Details	Start	End	Duration	
1	PFMEA Overview & 7-Steps Approach	AIAG-VDA New FMEA Overview-7-Steps Approach	9:00	9:30	0:30	
		FMEA type, what is the use, when to use, how to use?				
		PFMEA application [Why do, what to do, when to do it, who do, for whom do]				
	Coffee Break			10:30	10:40	0:10
	PFMEA 1 <sup>st</sup> Step: Planning & Preparation	PFMEA Overall analysis step	10:40	12:00	1:20	
		PFMEA Overall development combined with client's true real products/parts (such as: household electrical appliances / packaging materials supply chain management and key components) the PFMEA practice project start				
		PFMEA Headinfo filling requirements[FMEA date , Keydate... etc.]				
		PFMEA team discuss method [PFMEA team building] (new version emphasis added)				
		The past failure mode research and transfer into new projects PFMEA for failure prevention.				
	Lunch Break			12:00	13:00	1:00
	PFMEA 2 <sup>nd</sup> Step: Structure Analysis	PFMEA Template application	13:00	13:30	0:30	
		Team exercise and Reviews (1): Use the PFMEA function software template to start PFMEA practice with your business products / parts (such as: household electrical appliances / packaging materials supply chain management and key parts manufacturing) - Complete DFMEA Head Infor, Team, Research failure mode on past programs				
		PFMEA analysis scope definition-Process Flow	13:30	14:30	1:00	
		Choose the right Process Flow for your own business Team exercise and Reviews (2):Continue PFMEA exercises.Complete PFMEA Process Flow of your real products/parts (Select one key product/part or process in your charge business), to determine the scope of analysis boundary				
Coffee Break			14:30	14:50	0:10	
PFMEA 3 <sup>rd</sup> Step: Function Analysis	Identification process functional requirements - process functionality matrix	14:50	16:00	1:10		
	Team exercise and Reviews (3):Continue PFMEA exercises.Complete PFMEA Process-Function Matrix of your real products/parts (Select one key product/part or process in your					

		charge business), and transfer to FMEA worksheet process / function			
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### Training Schedule (Day 2)

Day	Topics	Details	Start	End	Duration	
2	<b>PFMEA Team Practice: Structure Analysis Function Analysis</b>	Review content, continue to improve the Team exercise of the Day1	9:00	9:30	0:30	
		Research failure mode on past programs				
		PFMEA analysis scope definition-Process Flow	9:30	10:30	1:00	
		Identification process functional requirements - process functionality matrix				
	PFMEA worksheet internal logic relations					
	Coffee Break			10:30	10:40	0:10
	<b>PFMEA 4 Step: Failure Analysis</b>	Failure Mode and Effects Analysis skills	10:40	12:00	1:20	
		The differences scoring criteria of Severity(S) in FMEA 4&5				
		PFMEA Failure cause / mechanism analysis skills				
		The differences scoring criteria of frequency(O) in FMEA 4&5				
Lunch Break			12:00	13:00	1:00	
<b>PFMEA 5~6 Steps: Risk Analysis ~ Optimization</b>	Analytical skills of the current process controls	13:00	14:30	1:30		
	The differences scoring criteria of detectivity(D) in FMEA 4&5					
	AP priority policy for Improve measures taken [FMEA 5 <sup>th</sup> ]					
	<b>Team exercise and Reviews (4)</b> : Continue PFMEA exercises. Complete failure analysis of failure modes of products/parts ( Select one key product/part or process)					
Coffee Break			14:30	14:40	0:10	
<b>PFMEA 7<sup>th</sup> Step: Results Documentation</b>	Team practice review and BP sharing	14:40	16:00	1:20		
	PFMEA with SOP/WI					
	PFMEA with Control Plan					
	Product Lifecycle Quality Strategy					
	The key to FMEA success					
	Q&A					

## Prerequisites

- Basic process/ technical experience.

## Course Methodology

- **Breakout Exercises**
  - The exercises will be conducted during each training stage to practice FMEA, and also to evaluate the understanding of the training courses.
  - The purpose of breakout exercises is to develop skills of dfmea Application by having individuals or teams working on practical situations
- **Evaluation of Individual Participation**
  - Attendees will be evaluated on class participation, which encompasses the following aspects:
    - Asking meaningful questions in class
    - Sharing professional experiences
    - Taking an active role in team exercises
  - Effective class participation provides the attendee with opportunities to demonstrate practical understanding of FMEA
- **Certificate**
  - Certificate will be issued after satisfied participatings, training performance evaluation.

*The course has been trained for the following well-known enterprises and has been highly recognized:*





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