



Advanced DFMEA Application for R&D (AIAG-VDA New Edition DFMEA)

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?”
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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.

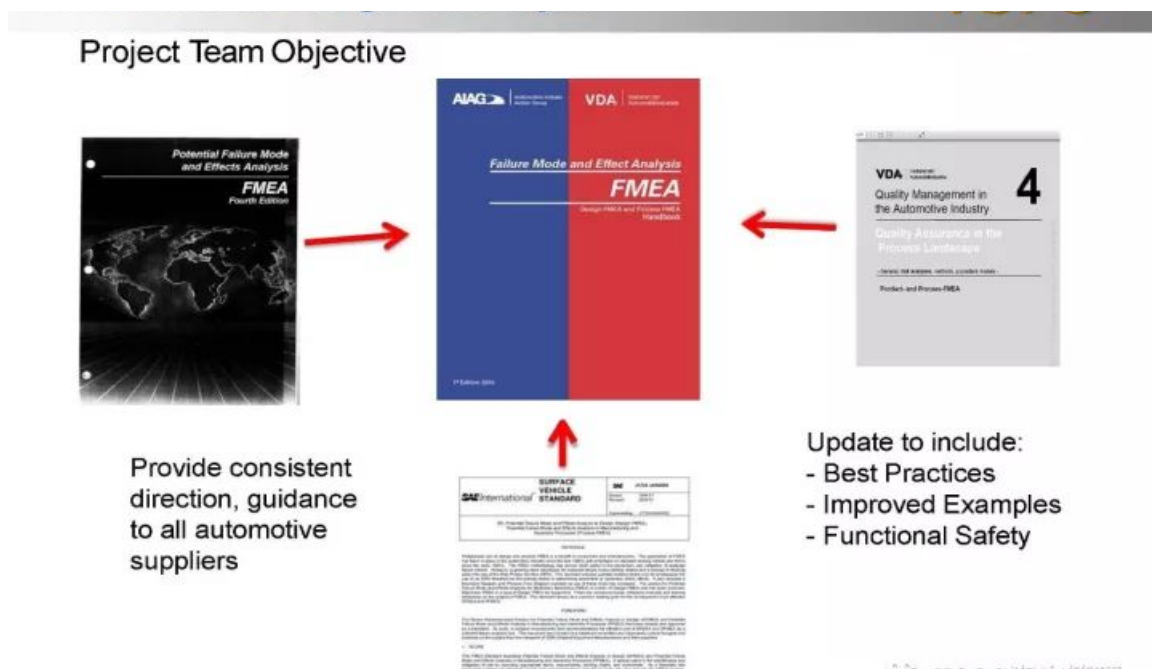
Typical symptom: after FMEA is finished, the engineer doesn't want to see it for the second time.

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
1st Step	2nd Step	3rd Step	4th Step	5th Step	6th Step	7th 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

Training Overview

DFMEA

DRBFM

功能分析-界面功能矩阵 Item/Interface-Interface & Function Matrix

根据Block框图在横坐标中添加部件接口描述
Add Interface Descriptions from Block Diagram in row.

填入Y/N来表示部件接口是否影响功能
Fill in Y/N to indicate interface effect

Functions	Interfaces	L	M	N	O	P	Q	R
7 The steering subsystem shall meet all applicable performance requirements identified in the SST/SCTS	BK: Gear to High Pressure Line Interface	Y	Y	Y	Y	Y	Y	Y
8 The hydraulic portion of the steering system must be capable of withstanding pressure and vacuum as dictated by all the applicable requirements in the SST/SCTS	BL: Gear to Low Pressure Line Interface	Y	Y	Y	Y	Y	Y	Y
9 The steering subsystem is designed to satisfy thermal requirements	BE: FOD Boot to Body Interface	Y	Y	Y	Y	Y	Y	Y
10 The steering subsystem shall provide physical compatibility with other subsystems and components as described in the VTS/SSTS (i.e., static & dynamic clearances)	BP: ABS Control Module to Gear Interface	Y	Y	Y	Y	Y	Y	Y
11 The steering subsystem must meet all dimensional and capacity requirements as identified in the VTS/SSTS	BK: Gear to High Pressure Line Interface	Y	Y	Y	Y	Y	Y	Y
12 The steering subsystem must meet all dimensional and capacity requirements as identified in the VTS/SSTS	BL: Gear to Low Pressure Line Interface	Y	Y	Y	Y	Y	Y	Y

DRBFM 应用技巧 DRBFM Application Skill

针对每一个更改所在的列(接口或部件), 在其影响功能要求的“Y”处, 右击鼠标并打上阴影
In each column (interface or component) where a change is being made, right click and shade the “Y” where the change impacts each functional requirement

功能分析-界面功能矩阵 Item/Interface-Interface & Function Matrix

通过应用“Transfer Matrix Items”功能单单把标识为Y的阴影单元格自动转入DFMEA页。
By utilizing the “Transfer Matrix Items” Function only the shaded Yes cells are automatically transferred to the DFMEA sheet.

DRBFM 应用技巧 DRBFM Application Skill

应用“Transfer Matrix Items”功能把打上阴影的Y单元格自动转入DRBFM页。
By utilizing the “Transfer Matrix Items” Function only the shaded Yes cells are automatically transferred to the DRBFM sheet.

功能分析-界面功能矩阵 Item/Interface-Interface & Function Matrix

界面和功能自动转入DFMEA分析页
Item and Function are automatically transferred to the analysis page.

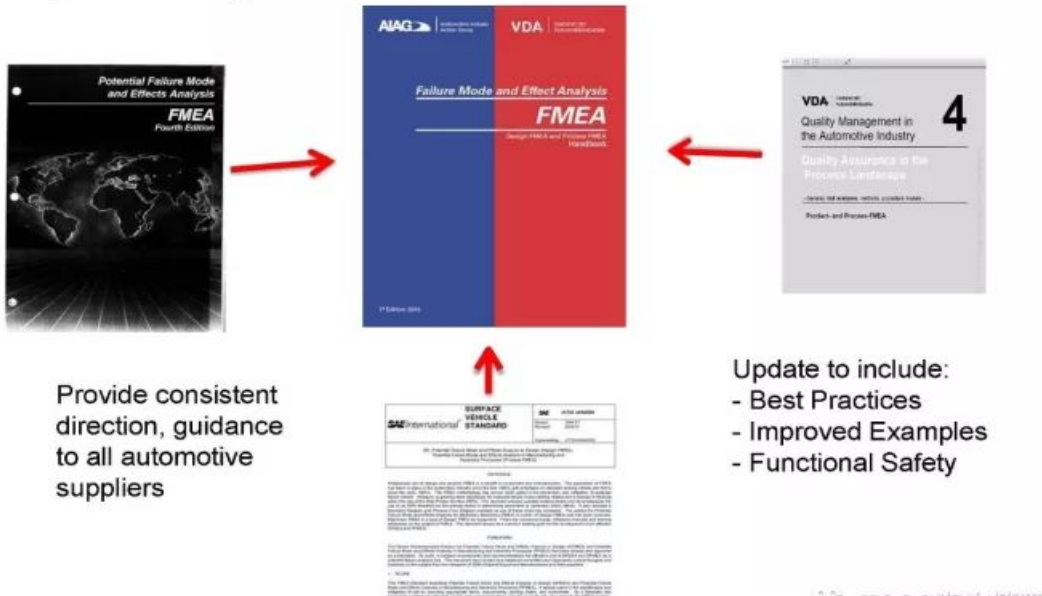
DRBFM 应用技巧 DRBFM Application Skill

当DRBFM完成后, DRBFM分析可以通过“Transfer to DFMEA”转换回DFMEA页以供今后参考
When DRBFM is complete, analysis can be transferred back to DFMEA sheet for future reference by “Transfer to DFMEA”.

Matrix中的更改部分转入DRBFM页中, 以供分析和评审。
The areas of change from the Matrix page are transferred to the analysis page for review

AIAG-VDA FMEA Main Update

Project Team Objective



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1 st Step	2 nd Step	3 rd Step	4 th Step	5 th Step	6 th Step	7 th Step
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Training Schedule (2Days)

(Day1)

Day	Topics	Details	Start	End	Duration	
Day1	DFMEA Overview & 7-Steps Approach	AIAG-VDA FMEA (New FMEA) change trend	9:00	9:30	0:30	
		FMEA type and purpose, customer definition and application opportunity				
		Introduction to DFMEA application	9:30	10:30	1:00	
		[why, under what circumstances, when, who and for whom DFMEA is done]				
		Overall development steps of DFMEA				
		DFMEA planning seven steps [how to integrate with product development process]				
	Coffee Break			10:30	10:45	0:15
	Design FMEA 1st Step: Planning & Preparation	Introduction to DFMEA practical function template	10:45	12:00	1:15	
		[practice project initiation in combination with our own product DFMEA]				
		Key points for filling in DFMEA header [FMEA date, key date, etc.]				
		DFMEA team discussion method [DFMEA team formation]				
		Previous failure mode investigation and prevention implementation in new project DFMEA				
	Lunch Break			12:00	13:00	1:00
	Design FMEA 2nd Step: Structure Analysis	→ Team exercises and comments (1): use the DFMEA function template issued to carry out DFMEA exercises of real products / parts, complete the analysis and development of DFMEA header, team and previous failure investigation stages	13:00	14:30	1:30	
Determination of DFMEA analysis scope - block diagram						
→ Team exercises and comments (2): continue the previous DFMEA exercises, complete the structural analysis diagram of DFMEA of real products / parts, and determine the analysis scope boundary of your own DFMEA						
Coffee Break			14:30	14:45	0:15	
Design FMEA 3rd Step: Function Analysis	Identification of customer functional requirements - interface function matrix / p-diagram	14:45	16:30	1:45		
	→ Team exercises and comments (3): continue the previous DFMEA exercises, complete the interface function matrix of the DFMEA of real products / parts, and automatically convert the items / functions in column 1 of the DFMEA table					
	Supplier integration (DFMEA)					
	All day summary and Q & A					

Day	Topics	Details	Start	End	Duration
Day2	Design FMEA 4 Step: Failure Analysis	Overall grasp of internal logical relationship of DFMEA worksheet	9:00	10:00	1:00
		DFMEA robust design correlation p-diagram (parameter diagram)			
		Failure mode and consequence analysis skills			
		Introduction to the difference between the new and old FMEA scoring criteria of severity s			
		Transmission of classification, product special characteristics and previous effectiveness investigation			
	Coffee Break		10:30	10:45	0:15
	Design FMEA 5~6 Steps: Risk Analysis ~ Optimization	DFMEA failure cause / mechanism analysis skills	10:45	12:00	1:15
		Logical relationship and confusion avoidance among failure mode consequence cause			
		Frequency o introduction to differences between new and old FMEA scoring criteria			
		Analysis skills of current design control measures			
		Introduction to difference between new and old FMEA scoring criteria for detection D			
	AP / RPN and the priority strategy of taking measures [emphasis in the new version]				
	Lunch Break		12:00	13:00	1:00
	Design FMEA 7th Step: Results Documentation	→ Team exercises and comments (4): continue the previous DFMEA exercises and complete the complete analysis of more than 2 failure modes in the DFMEA worksheet of real products / parts.	13:00	14:30	1:30
		DFMEA quality assessment method			
DFMEA is associated with PFMEA					
DFMEA is associated with DVP & R (design verification plan report)					
Coffee Break		14:30	14:45	0:15	
-DRBFM	The new FMEA focuses on "change" failure prevention methods - DRBFM	14:45	16:30	1:45	
	DRBFM application skills and examples				
	→ Team exercises and comments (5): DRBFM based on the actual products of the enterprise				
Q&A	Links between DFMEA and other quality tools [QFD, TRIZ, DOE, DFSS]				

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:



