DESIGN-FMEA

Step 1: Planning and Preparation	Create a project description and a project plan. Define the scope of analysis, team, time and tool.
Step 2: Structure Analysis	Visualize the scope of analysis alternatively as a structure tree or block diagram or digital model.
Step 3: Function Analysis	Formulate and specify functions and function relationships in nets.
Step 4: Failure Analysis	Visualize the error chain for each product function.
Step 5: Risk Analysis	Use your knowledge and assign actions to causes and types of errors. Determine the Action Priority using severity, occurrence and detection.
Step 6: Optimization	Identify risk-reducing actions and evaluate the risk again after their implementation.
Step 7: Results Documentation	Make FMEA data available for reuse. Inform management (reports, key figures, risks, actions).

Guideline for Team Members

- You are an expert: Offer expertise.
- Be there exclusively for the FMEA team meeting and prepare yourself. Your input is important for the success of the team.
- Respect the experts next to you – accept different options.
- The team is counting on you!
- Enquiries are not a sign of incompetence.
- Participate actively.
- Take responsibility.

peak avenue

AIAG & VDA FMEA Alignment

The 7 Steps of Design-FMEA

Evaluation of the Severity Criteria			Evaluation of the Occurrence		Evaluation of the Detection	
10	very high	Affects safe operation of the vehicle and/or other vehicles, the health of driver or passenger(s) or road users or pedestrians.	extremely high	First application of a new technology anywhere without operating experience and/or under uncontrolled operating conditions. No product verification and/or validation experience. Standards do not exist and best practices have not yet been determined. Prevention controls not able to predict field performance or do not exist.	very low	Test procedure yet to be developed.
9		Noncompliance with regulations.	very high	First use of a design with technical innovations or materials within the company. New application or change in duty cycle/operating conditions. No product verification and/or validation experience. Prevention controls not targeted to identify performance to specific requirements.		Test method not designed specifically to detect failure mode or cause.
8	high	Loss of primary vehicle function necessary for normal driving during expected service life.		First use of design with technical innovations or materials on a new application. New application or change in duty cycle/operating conditions. No product verfication and/or validation experience. Few existing standards and best practices, not directly applicable for this design. Prevention controls not a reliable indicator or field performance.	low	New test method, not proven.
7		Degradation of primary vehicle function necessary for normal driving during expected service life.	high	New design based on similar technology and materials. New application or change in duty cycle/operating conditions. No product verification and/or validation experience. Standards, best practices, and design rules apply to the baseline design, but not the innovations. Prevention controls provides limited indication of performance.		
6	moderate	Loss of secondary vehicle function.		Similar to previous design, using existing technology and materials. Similar application with changes in duty cycle or conditions. Previous testing or field experience. Standards and design rules exist but are insufficient to ensure that the failure cause will not occur. Prevention controls provide some ability to prevent a failure cause.	moderate	Proven test method for verification of functionality or validation of performance, quality, reliability and durability; planned timing is later in the product development cycle such that test failures may result in production delays for re-design and/or re-tooling.
5		Degradation of secondary vehicle function.	moderate	Detail changes to previous design, using proven technology and materials. Similar application, duty cycle or operating conditions. Previous testing or field experience, or new design with some test experience related to the failure. Design adresses lessons learned from previous designs. Best Practices re-evaluated for this design but have not yet been proven. Prevention controls capable of finding deficiencies in the product related to the failure cause and provide some indication of performance.		
4		Very objectionable appearance, sound, vibration, harshness, or haptics.		Almost identical design with short-term field exposure. Similar application, with minor change in duty cycle or operating conditions. Previous testing or field experience. Predecessor design and changes for new design conform to best practices, standards, and specifications. Prevention controls capable of finding deficiencies in the product related to the failure cause and indicate likely design conformance.	high	Proven test method for verification of functionality or validation of performance, quality, reliability and durability; planned timing is sufficient to modify production tools before release for production.
3	low	Moderately objectionable appearance, sound, vibration, harshness, or haptics.	low	Detail changes to known design (same application, with minor change in duty cycle or operating conditions) and testing or field experience under comparable operating conditions, or new design with successfully completed test procedure. Design expected to conform to standards and best practices, considering lessons learned from previous designs. Prevention controls capable of finding deficiencies in the product related to the failure cause and predict conformance of production design.		
2		Slightly objectionable appearance, sound, vibration, harshness, or haptics.	very low	Almost identical mature design with long term field exposure. Same application, with comparable duty cycle and operating conditions. Testing or field experience under comparable operating conditions. Design expected to conform to standards and best practices, considering lessons learned from previous designs, with significant margin of confidence. Prevention controls capable of finding deficiencies in the product related to the failure cause and indicate confidience in design conformance.		
1	very low	No discernible effect.	extremely low	Failure eliminated through prevention control and failure cause is not possible by design.	very high	Prior testing confirmed that failure mode or cause cannot occur, or detection methods proven to always detect the failure mode or failure cause.