

AIAG & VDA FMEA Handbook

The new standard to analyse risks within the automotive supply chain

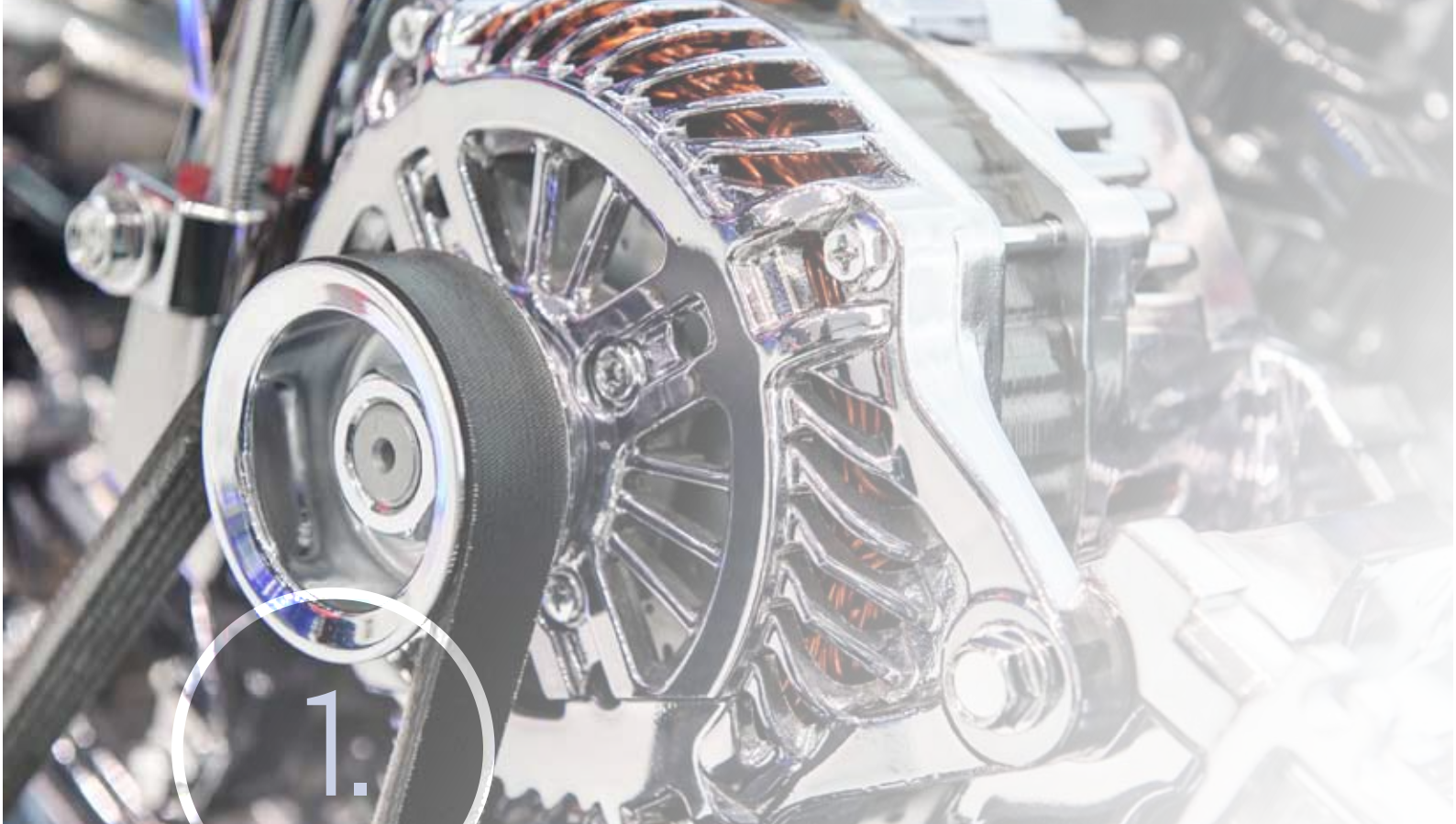
Failure Mode and Effects Analysis



Editor

VDA QMC

Quality Management Center (QMC)
German Association of the Automotive Industry e.V.
Behrenstraße 35, 10117 Berlin
www.vda-qmc.de



FMEA – part of development and production in the automotive industry

The relevant standards applied in the automotive industry require that the contractual arrangements between customer and supplier include the implementation of technical risk analyses.

FMEA as the fundamental method in technical risk management is a team-oriented and systematic analytical method to identify risks in order to define mitigation measures. Detecting a failure cause too late in the development and manufacturing process or not till the product is launched on the market may entail cost-intensive and time-consuming rework and corrective actions. Implementing the FMEA early in the product development process helps identifying product and process risks and reducing or even preventing their occurrence by taking suitable measures.

Implementing the FMEA is necessary to improve customer satisfaction by means of zero-defect products. That goes hand in hand with the reduction and prevention of failure costs and consequential failure costs for warranty and goodwill or the recall of faulty products.

Cost savings by standardizing the FMEA

Baseline FMEAs help minimizing the costs of creating the FMEA. Such baseline FMEAs contain lessons learned by the company from previous developments and thus become the proper starting point of new FMEA projects.

Reducing the costs of changes is another reason to consistently apply FMEA. This relates the number of changes and the directly associated modification effort including processing and documentation. Changes can be triggered by customers, suppliers, or internal departments.

The only way to avoid changes and modifications in a lasting manner or to at least minimize the arising expenses by means of the FMEA is to involve customers, suppliers, and the specialist internal departments early in the development of products and processes.

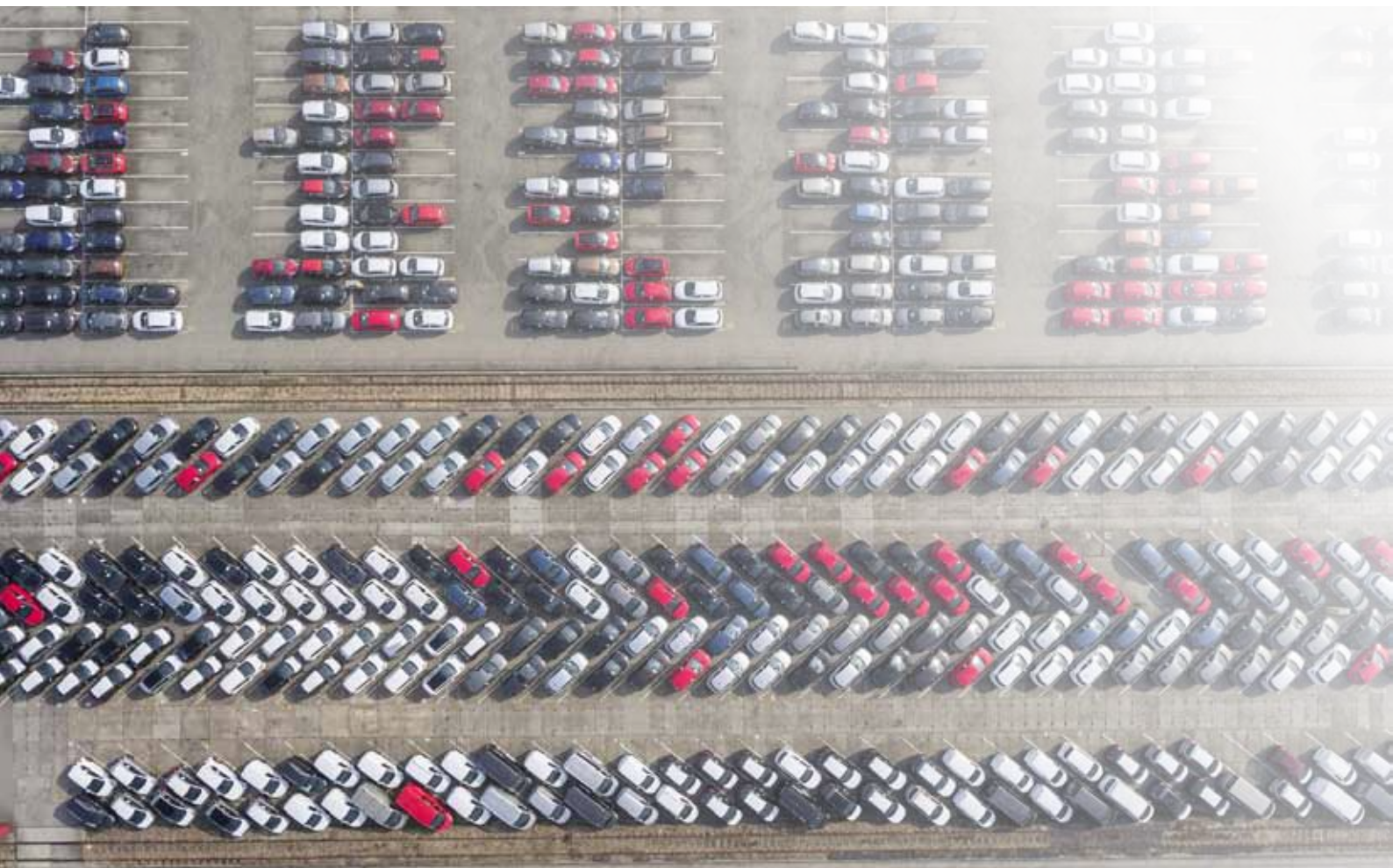
2.

Motivation to align the standards of AIAG and VDA

Suppliers providing their products to European and North-American manufacturers (OEM) are required to evaluate the FMEA on the basis of the different tables in the VDA and the AIAG FMEA handbooks. To date that resulted in occasional confusion and increased the complexity of product development and improvement for suppliers.

The shared requirements and expectations with regard to the FMEA now enable suppliers to follow a standardized process for the FMEA that meets the expectations and needs of their customers.

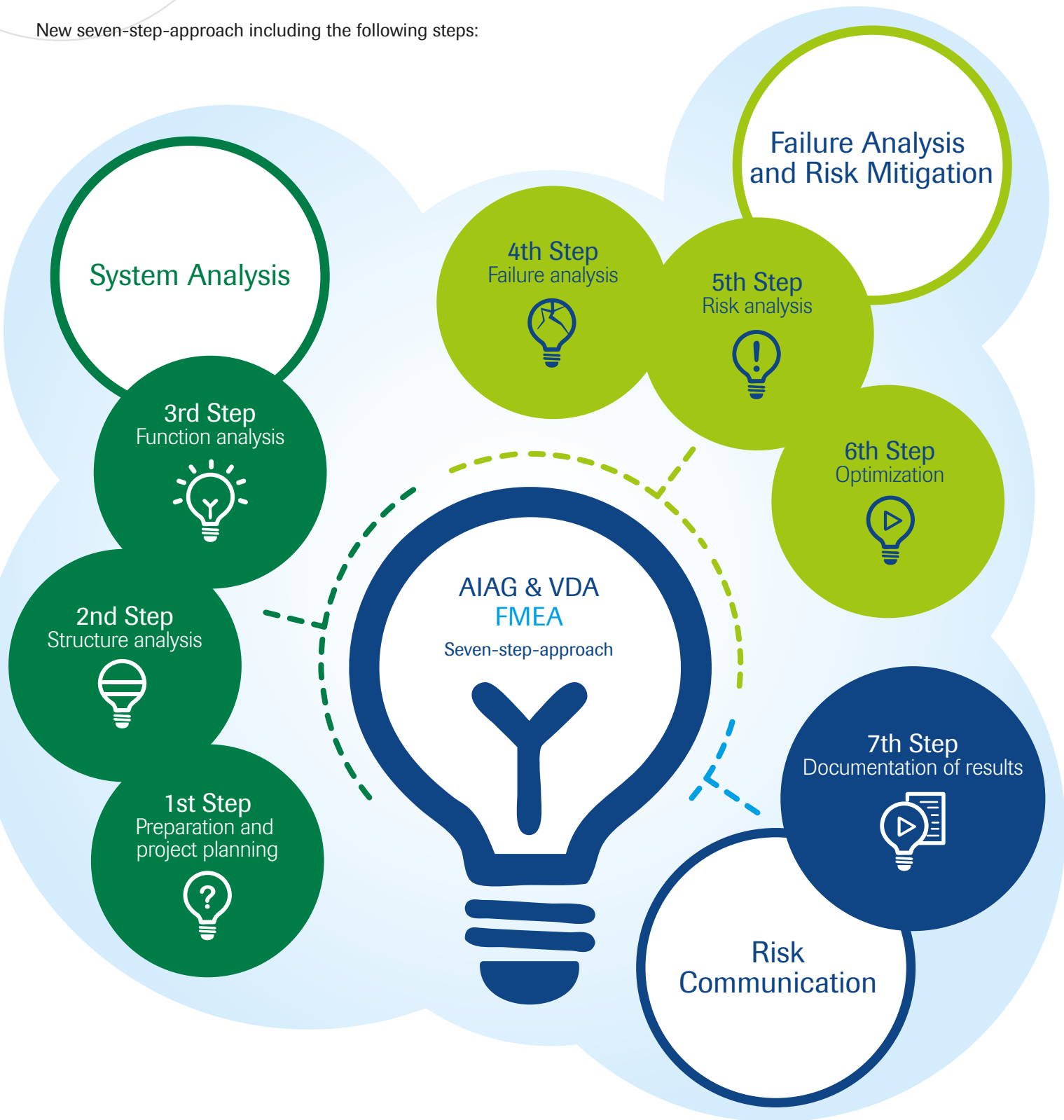
Initially, the alignment focused on standardizing and adjusting the FMEA evaluation tables including the criteria and descriptions of the evaluation. A single document to evaluate failures is the ideal result – two aligned documents would lead to concerns on the suppliers' side. While they discussed the problems in the industry, the representatives of VDA and AIAG came to an agreement that this might be an opportunity to align and standardize other parts of both handbooks as well.



3.

Improvement of the standard and special features of the new handbook

New seven-step-approach including the following steps:





Step 1: Project planning and preparation

Content: Project identification, project plan, analysis boundaries, and determination of the baseline FMEA to apply

The most important changes are:

- Definition of analysis boundaries
- Revision of form headers



Step 2: Structure analysis

Content: Identification of scope of analysis, Design FMEA, Process FMEA, responsibilities, and basis for function analysis

The most important changes are:

- Concerning the Design FMEA: Description of block-/boundary diagram
- Concerning the Process FMEA: Description of process flow diagram and structure tree
- Collaboration between customer and supplier



Step 3: Function analysis

Content: Visualization of product or process functions, association of requirements and characteristics to functions, collaboration between engineering teams (systems, safety, and components), and basis for failure analysis

The most important changes are:

- Visualization by means of parameter diagram
- Description of collaboration between engineering teams



Step 4: Failure analysis

Content: Establishment of the failure chain, collaboration between customer and supplier (failure effects), basis for the documentation of failures in the FMEA form and for risk analysis

The most important changes are:

- Introduction of the concept of the focus element
- Connections between Design FMEA and Process FMEA
- Collaboration between customer and supplier



Step 5: Risk analysis

Content: Description and evaluation of implemented and/or planned actions, definition of action priority (AP), basis for product or process optimization

The most important changes are:

- Revision of evaluation tables for severity (S), occurrence (O), and detection (D)
- Enhancement of the Process FMEA by the severity including the effects to your plant, the ship-to plant (if known), and the end user (if known)
- The action priority (AP) replaces the risk priority number (RPN)



Step 6: Optimization

Content: Identification of actions necessary to reduce risks, assignment of responsibilities and deadlines for the implementation of actions, implementation and documentation of actions taken (including confirmation of the effectiveness), collaboration between the FMEA team, management, customers, and suppliers regarding potential failures, basis for the improvement of product and/or process requirements and of prevention and detection actions

The most important changes are:

- Detailed description of the optimization
- Collaboration between FMEA team, management, customer, and supplier



Step 7: Documentation of results - NEW

Content: Documentation and communication of implemented measures to reduce risks, assessment of the effectiveness of the actions taken

The most important changes are:

- Scope and results of the FMEA are summarized in the report
- Reference to technical risks of failures as part of the development plan and the project milestones



Outlook



The AIAG & VDA FMEA Handbook for the new standard will be published by June 2019.

Starting in June, VDA QMC will offer training courses on the subject of FMEA in addition to the handbook after it was published.

Contact

Open Trainings

Phone: +49 30 897842-252 and -253

E-mail: seminare@vda-qmc.de

In-house trainings

Phone: +49 30 897842-255 and -257

E-mail: inhouse@vda-qmc.de

Training license partners

Phone: +49 30 897842-254 and -256

E-mail: licence@vda-qmc.de

The logo consists of the letters 'VDA' in a bold, green, sans-serif font, followed by a vertical line, and then the letters 'QMC' in a bold, blue, sans-serif font.

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im Verband der Automobilindustrie