

WB14 FMEA-MSR (Mechatronics FMEA)

- **Characteristics and structure of mechatronic systems**
- **Introduction to mechatronics FMEA (FMEA-MSR): System behavior without and with diagnosis + Robust diagnosis**
- **IQ software: Integration of the FMEA-MSR consideration into the system FMEA**

Mechatronic systems enable novel and/or improved product functionalities through clever combination of *mechanics*, *electrics/electronics* (E/E) and *software*, but also increase the product complexity and thus the number of possible failures. A system FMEA is therefore essential. However, not all safety-critical product failures of *E/E system components* identified in the risk analysis can be conclusively solved by the design. However, when they occur during product use (customer operation), they lead to dangerous consequences for the user and/or his environment. Therefore, a suitable diagnosis (so-called *failure detection*) must be defined for such failures during product development, which detects the failure in time during operation. Furthermore, a transition to the safe state must be provided for the diagnosed failure (so-called *failure reaction*).

According to AIAG/VDA, an additional analysis in the form of the so-called **FMEA-MSR** (FMEA for Monitoring and System Response) should be carried out to record these *impact-limiting actions*. This means that the system behavior is first mapped *without* a diagnosis (*unsecured path*) and then *with* a diagnosis (*secured path*).

In this seminar, we teach you step-by-step how to integrate this FMEA-MSR consideration for *E/E system components* into the system FMEA at the same time:

- Identification of safety-critical failures and their effects without a diagnosis (so-called *unsecured path*) in the system FMEA.
- Definition of suitable diagnosis and reaction leading to reduced effect (so-called *secured path*)
- Ensuring *robust* diagnosis and reaction by analyzing possible failures and defining possible counteractions

Technical requirements:

Inform yourself conveniently from any location about the advanced functionalities of the IQ software and save travel expenses/time. To do this, take part in our live online seminar. All you need is an Internet-capable computer with a browser and a headset (VoIP) or a telephone (audio).

💡 EACH PARTICIPANT RECEIVES A TEMPORARY TRAINING LICENSE OF THE IQ SOFTWARE FOR THE SEMINAR. FOR THE EXERCISES WITH THE IQ SOFTWARE WE RECOMMEND THAT YOU WORK WITH TWO MONITORS IN ORDER TO BE ABLE TO FOLLOW THE TRAINER'S DEMONSTRATIONS IN PARALLEL.

Quality promise: Not just an online lecture

As with our face-to-face seminars, this online seminar will not only provide you with knowledge, but will also give you time to practice and answer your questions individually. Therefore, each thematic block is followed by an exercise. You can ask the trainer individual questions at any time via chat or hand signals.

💡 THE SEMINAR IS ACCOMPANIED BY A TRAINING DOCUMENT, WHICH YOU WILL RECEIVE IN ADVANCE AS PDF.

Live, no recording!

The seminar is conducted live by an experienced APIS trainer.

The Seminar Concept: Distributed Sessions instead of endless loops

In contrast to the face-to-face seminar, with the online seminar we have the advantage of training at a time when you have the best concentration. For this reason, the seminar is spread over two mornings from 8:30 a.m. to 12:30 p.m. The breaks will be individually arranged in the group.

Details of the Seminar

Target group	FMEA supervisors and FMEA facilitators, who create FMEA for mechatronic systems and want to map the system behavior realistically including the integrated diagnoses and their effects.
Prior knowledge	Knowledge of methodology and experience in FMEA according to VDA and AIAG as well as safe handling of the basic functions of the APIS IQ software. Such knowledge is imparted e.g. in the seminar <i>Two-in-One (WB03)</i> .
Seminar duration	2 mornings: 8:30 a.m. to 12:30 p.m.
Services	Experienced APIS trainer; Good supervision ratio due to limited number of participants; Temporary IQ training licence; participant documents
Seminar fee	Please refer to the list of fees and dates.

Seminar content and schedule	2 morning sessions each from 8:30 a.m. to 12:30 p.m.
Session 1 to 2	<ul style="list-style-type: none"> • Characteristics and structure of mechatronic systems • Introduction to mechatronics FMEA (FMEA-MSR) <p>FMEA-MSR in the system FMEA with IQ software:</p> <ul style="list-style-type: none"> • System FMEA <i>without</i> safety mechanisms (AP for system FMEA) • Identification of the <i>safety-critical</i> failures of E/E system components • Modeling of a suitable safety mechanism in the failure net (secured path) • Integration of the safety mechanism in the FMEA form (AP for FMEA-MSR) • Ensuring robust safety mechanisms

Live Online: Organisational details

Registration: Form (see last page) by e-mail to training@apis.de

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General Terms of Business of APIS Informationstechnologien GmbH

Registration

All registrations for our seminars must be received in writing – by e-mail. By registering for one of our seminars, customers agree to be bound by our General Terms of Business.

Due to the limited number of places available for our seminars, they are awarded on a "first come, first served" basis. Registrations only become effective once they have been confirmed in writing.

If the minimum number of participants is not attained for a particular seminar then we will notify you immediately and offer an alternative date if required.

Cancellation

A cancellation fee of 20% of the attendance fee is payable if cancellation notification is received between 8 weeks and 2 weeks before the start of the seminar. If the cancellation is received less than 2 weeks before the start of the seminar then the full attendance fee is payable. We appreciate your understanding in this matter. However, it is possible to appoint a substitute participant by arrangement. You will be notified immediately if an event needs to be canceled.

In all cases the liability of APIS Informationstechnologien GmbH is limited exclusively to the attendance fee. The course instructor and the seminar program are subject to change without notice.

Fees

For details of our seminar fees, please refer to the list of seminar dates and fees. All prices are quoted per participant and are subject to VAT. The seminar fee is payable without deductions after the invoice is issued.

Scope of Validity

These General Terms of Business apply to the running of seminars and training courses in the training facilities of APIS Informationstechnologien GmbH and in external training facilities. Any changes will only be valid if they are agreed in writing.

Data Protection

By registering for a place on one of our courses you agree to your data being electronically stored and processed for the purpose of dealing with your registration.

Teaching Materials

All rights reserved worldwide. The training documents must not, even in the form of excerpts, be duplicated, passed on, re-written, saved in a database or translated into a different language without the express written authorization of APIS Informationstechnologien GmbH. Duplication is not permitted either electronically, mechanically, magnetically or manually.



REGISTRATION

Please send by e-mail to:

APIS Informationstechnologien GmbH
Wolfenbütteler Straße 31 B
D-38102 Braunschweig

Mail: training@apis.de

Seminar title	Date	Location

Participant(s):

(Title) Surname, First name	E-Mail

Information for the invoice (please fill in completely):

Company address:

Billing address (if differently from company address):

Order No.: _____

Phone / Fax: _____

Tax ID Number: _____

Location / Date: _____

Signature: _____