



## Trainings 2025

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## Overview

### 1. Whole vehicle homologation EU

- Part 1
- Part 2

### 2. Approval of vehicles with internal combustion engines EU

- WLTP
- RDE
- BES / AES

### 3. Homologation of electrified vehicles in terms of energy consumption and range EU

### 4. Noise emission from 4- and multi-wheel vehicles UNECE

### 5. Noise Emission: Real Driving Additional Sound Emission Provisions (RD-ASEP)

### 6. Functional Safety Foundation Training

### 7. SOTIF Foundation Training

### 8. CSMS & SUMS Foundation Training

### 9. Requirements for a Software Update Management System UNECE R-156

### 10. ISO/SAE 21434 Training (including TARA)

### 11. Autonomous Driving (AD): Requirements for safety management systems (SMS)

### 12. Electrical Safety according to UNECE R100

### 13. QM: Fundamentals of Management Systems

### 14. QM: Designing processes effectively and efficiently



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> Presence or Online

> 4 hours



## WORKSHOP

# 1. WHOLE VEHICLE CERTIFICATION EU

## Part 1

### AGENDA

- Self-certification vs. EU Type Approval process
- Structure of Type Approval number
- VO 2018/858 and other framework regulations
- Scope and Type determination
- Manufacturer initial assessment
- Role of the parties involved Type
- Variant Version (TVV)
- Transitional Provisions
- New Types vs. new vehicles
- Expiration of the Type Approval Basic approval / addendum / revision / correction
- Requirements for test equipment / calibration / test laboratory

### INFO

This workshop provides an initial overview of the topic of homologation and conveys all relevant content relating to the homologation process for vehicles. The topics are clearly conveyed by experts from the field of homologation and worked out interactively with the participants using practical examples.



> Presence or Online

> 4 hours



## WORKSHOP

# 1. WHOLE VEHICLE CERTIFICATION EU

## Part 2

### AGENDA

- Conformity of Production (CoP)
- Certificate of Conformity (CoC)
- Dealing with non-conformities
- Approval of small series
- Single-phase vs. multi-phase Type Approval
- Single-stage vs. multi-stage Type Approval
- Special purpose vehicles
- Adoption of test results
- GSR II
- New legal requirements in the making
- Cyber security
- Software update management systems
- Autonomous driving

### INFO

This workshop deals with other topics in the field of homologation and can also be booked together with the 1st part as a full-day workshop.



> Presence or Online

> 3 hours



## TRAINING

# 2. APPROVAL OF VEHICLES WITH INTERNAL COMBUSTION ENGINES EU

WLTP

Including  
Euro 7  
Update

## AGENDA

- Overview of EU emissions legislation
- Differences in the NEDC/WLTC test cycles
- Various emission standards and their limit values
- Drive concepts
- Scope of testing
- Corrections (RCB, Speed and Distance, Ki)
- Aging Strategies
- Calculation methodology
- Interpolation Families
- Determination of the final exhaust gas and CO<sub>2</sub> emissions
- Special purpose vehicles
- Market Surveillance (CoP and ISC)
- Outlook for future legislation



## INFO

This training serves to impart knowledge on the subject of exhaust gas certification and the corresponding legal basis. It is aimed at interested participants from the field of emissions and can be booked as an individual training course or as a package together with "RDE" and "BES / AES".



> Presence or Online

> 3 hours



## TRAINING

# 2. APPROVAL OF VEHICLES WITH INTERNAL COMBUSTION ENGINES EU REAL DRIVING EMISSIONS (RDE)

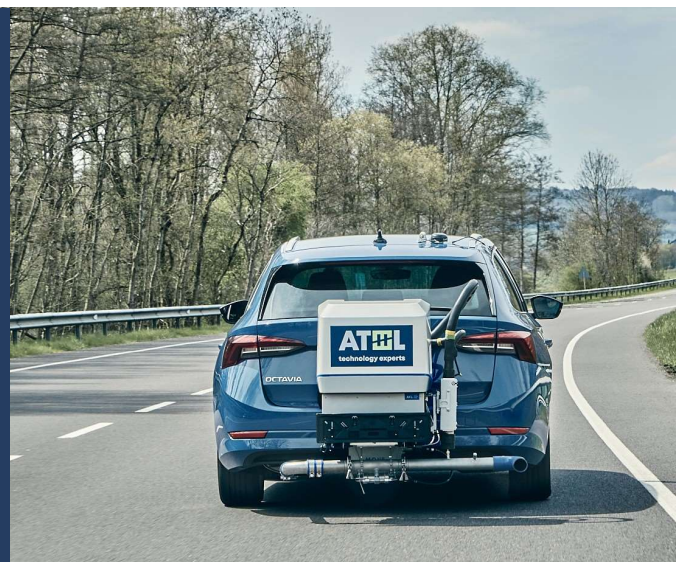
Including  
Euro 7  
Update

## AGENDA

- Introduction of Real Driving Emissions (RDE)
- Evolution stages RDE packages
- Boundary conditions for test drives
- Connection WLTP and exhaust emission levels EU6 & EU7
- Portable Emission Measurement System (PEMS) measurements
  - RDE Type test
  - Evaluation methods
  - Delivery of RDE data
- Calculation methods
- Basics of In-Service-Conformity (ISC)

## INFO

This training primarily deals with the subject of Real Driving Emissions (RDE) and is aimed at manufacturers and technical services. It can also be booked in combination with the parts WLTP and/or BES / AES.



> Presence or Online

> 2,5 hours



## TRAINING

# 2. APPROVAL OF VEHICLES WITH INTERNAL COMBUSTION ENGINES EU

**BES / AES**

Including  
Euro 7  
Update

## AGENDA

- EU legal background
- What is a defeat device?
- Under what circumstances are defeat devices allowed?
- What is a BES and AES?
- What are the requirements for the manufacturer?

## INFO

This training course with a focus on defeat devices can be booked individually or together with the topics WLTP and/or RDE.



> Presence or Online

> 3 hours



## TRAINING

# 3. HOMOLOGATION OF ELECTRIFIED VEHICLES EU

## Energy consumption and range

### AGENDA

- Overview of worldwide requirements
- Classification EU regulation 2023/443 – WLTP 3rd Act
- Explanation of test locations (roller test bench, road, engine test bench, etc.)
- Measurement technology (analysis technology, driving monitor, current measuring clamp, PEMS, etc.)
- Explanation of the required tests and test methods for Battery Electric Vehicles (BEV)
- Explanation of the required tests and test methods for plug-in hybrid electric vehicles (PHEV)

### INFO

This training provides an overview of the consumption and range-related regulations for electrified vehicles (PHEV and BEV) for the EU market and presents the test procedures clearly and with the help of examples.





> Presence

> 4 hours



## TRAINING

# 4. NOISE EMISSION FROM 4 AND MULTI-WHEEL VEHICLES UNECE

## AGENDA

- Introduction to environmental noise
- Vehicle noise legislation - content of UN R51.03
- Relevance with regard to periodic technical inspections or Type Approvals
- Background information on UN R51.03, historical development
- Interaction with EU legislation (540/2014/EG)



## INFO

This training provides an overview of the topic of noise emissions in the context of UN R51.03 and conveys the requirements of periodic technical inspections and Type Approvals. The content is clearly conveyed by a top expert in the field of acoustics; if desired and available with a practical part on a test track.

> Presence or Online

> 4 hours



## WORKSHOP

# 5. NOISE EMISSION: REAL DRIVING ADDITIONAL SOUND EMISSION PROVISIONS (RD-ASEP)

**CONCEPT - TECHNICAL BACKGROUND -  
EXERCISES - INSTRUCTIONS FOR MONITORING**

## AGENDA

- Introduction of RD-ASEP and current developments
- Explanation of the concept and structure of the "Sound Expectation Model" (SEM)
- Provisions for the monitoring phase
- Introduction of the mandatory GRBP record sheet
- Explanation of which data must be collected during the Type Approval process and which data must be transmitted to UN-ECE GRBP via the Type Approval authorities
- Forecast for the years after the observation period ended June 30, 2024

## INFO

This workshop reaches out to manufacturers, technical services and authorities in order to bring the new RD-ASEP concept closer to the groups involved and to offer a practice-oriented trainee program for the upcoming monitoring phase.



- > Presence or Online
- > 8 hours



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## TRAINING

# 6. FUNCTIONAL SAFETY FOUNDATION TRAINING

### ÁGENDA

- Introduction to basic concepts and terminology of Safety and Functional Safety
- General overview of the Automotive Functional Safety Standard ISO 2626:2018
- Project-specific and cross-cutting safety management activities (e.g., safety planning, safety case development, independent safety audits and assessments, competence management, roles, and responsibilities)
- Safety activities in the concept phase (ASIL determination, functional safety concept)
- Safety activities in system, hardware, and software development
- Collaborative development, tailoring, and supplier management
- Practical tips for implementing the normative requirements of ISO 26262



### INFO

The training is aimed at professionals and executives who need a practice-oriented introduction to functional safety for automotive applications according to ISO 26262. The training can be conducted in either German or English

- > Presence or Online
- > 16 hours



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## TRAINING

# 7. SOTIF FOUNDATION TRAINING

### ÁGENDA

- Introduction to the different aspects of Safety
- Comparison of normal function safety (SOTIF) and functional safety (FuSi)
- Introduction to SOTIF terminology, including:
  - Use cases, scenes, and scenarios
  - Functional insufficiencies and triggering conditions
- SOTIF fundamental concepts, including:
  - The four basic scenario categories and their evolution
- Activities and methods to ensure a safe normal function
- General overview of the Automotive SOTIF Standard ISO 21448:2022 and the SOTIF lifecycle
- Core activities of the SOTIF lifecycle, including:
  - SOTIF HARA
  - SOTIF verification and validation
  - SOTIF release and continuous SOTIF activities

### INFO

The training is aimed at professionals and executives involved in the development of automated driving functions, as well as those who need an introduction to the topic of SOTIF. The training can be conducted in either German or English.



> Presence or Online

> 16 hours



## TRAINING

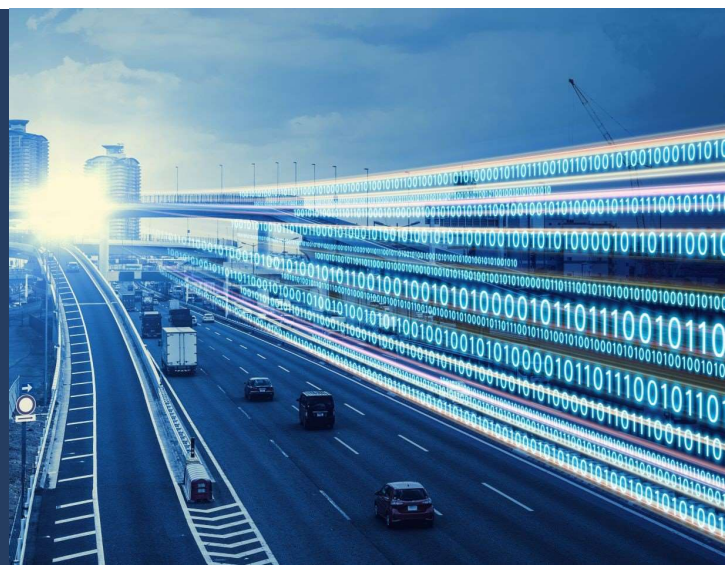
# 8. CSMS & SUMS FOUNDATION TRAINING

### AGENDA

- General overview and focus of the relevant management systems: ISO/IEC 27001:2022, UNECE R-155 and R-156, Quality Management System ISO 9001:2015, Requirement Management System
- General overview of the Automotive Security Standard ISO/SAE 21434:2021 and ISO 24089:2023
- Goals and requirements for comprehensive cybersecurity management and software update management
- Distributed cybersecurity activities (supplier management, in scope / out of scope activities)
- Continuous cybersecurity activities (monitoring, measurements, risk assessments)
- Software update and cybersecurity management activities and product lifecycle management activities

### INFO

This training contains specific insights into the cybersecurity & software update requirements in the automotive sector according to the homologation requirements of the United Nations Economic Commission for Europe UNECE R-155 & R-156.





> Presence or Online

> 8 hours



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## TRAINING

# 9. REQUIREMENTS FOR A SOFTWARE UPDATE MANAGEMENT SYSTEM UNECE R-156

## AGENDA

- General requirements for software updates for vehicle manufacturers (optional: special features in the context of multi-stage approvals)
- Relationship between UNECE regulation R-156 (SUMS) and ISO 24089:2023
- Requirements for a SUMS concept include:
  - RxSWIN
  - Over-the-air updates
  - Software Compatibility
  - Software Delivery
  - Assessment of homologation relevance / change management
  - Cyber security requirements as part of SUMS

## INFO

This training deals with the requirements that are specified in the regulations and standards for the management of software updates, vehicle and software identification and must be complied with by vehicle and component manufacturers. If desired, it can also deal with the specifics of multi-stage approvals.

> Presence or Online

> 16 hours



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## TRAINING

# 10. ISO/SAE 21434:2021 TRAINING (INCL. TARA)

## AGENDA

- Overview of regulation and standardization
- Explanation of the most important normative requirements
- Relevance of ISO/SAE 21434:2021 in the context of cybersecurity
- Organization-level overview of cybersecurity
- Overview of the product development process (product life cycle): concept phase, development phase and post-development phase
- Threat Analysis Risk Assessment / TARA (risk analysis)
- Context of ISO/SAE 21434:2021 (work products) as a basis for fulfilling UNECE R-155 (requirements)



## INFO

The ISO/SAE 21434:2021 training includes a comprehensive program that covers basic to advanced industry concepts and teaches participants how to implement the requirements of the R-155.

> Presence or Online

> 3 hours



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## TRAINING

# 11. AUTONOMOUS DRIVING (AD): REQUIREMENTS FOR SAFETY MANAGEMENT SYSTEMS (SMS)

## AGENDA

- Laws with requirements for safety management systems in the area of AD Level 3 and 4 (VO (EU) 2022/1426, UN R157, AFGBV)
- Overview of the requirements for management systems for autonomous driving
- AD Security Management System Approval Process
- Transfer of legal requirements into concrete management system requirements
- Explanation of the subject areas of the requirements in relation to the company processes
- Procedure for determining the current status
- Methodology to meet the requirements yet to be implemented
- AD SMS challenges and risks

## INFO

This training provides an overview of the legal requirements for safety management systems (SMS) in the area of Autonomous Driving (AD). It forms the ideal basis for getting to know the legal AD SMS requirements and for getting an overview of how to deal with them and how to effectively adapt the existing management system.



- > Presence or Online
- > 3 hours



## TRAINING

# 12. Electrical Safety according to UNE ECE R100

## BASIC SEMINAR

### AGENDA

- Necessity of Regulation
  - Market Growth of E-Vehicles
  - Political Will ("EU Green Deal")
  - Hazard Potential
- Technical Fundamentals
- Legal Fundamentals
- Vehicle Testing
- Battery Testing

### INFO

The seminar covers the necessity of the UNECE R100 regulation in the context of the market growth of electric vehicles and political will (e.g., EU Green Deal). It provides technical and legal foundational knowledge on high-voltage safety, including hazard potential, protective measures, and relevant testing procedures for vehicles and batteries. The goal is to create an understanding of regulatory requirements and their practical implementation.



- > Presence or Online
- > 8 hours



## TRAINING

# 13. QM: Fundamentals of Management Systems

**Debunk Myths – Implement Efficiently – Understanding the Basics of Quality, Cyber Security & Software Update Management Systems**

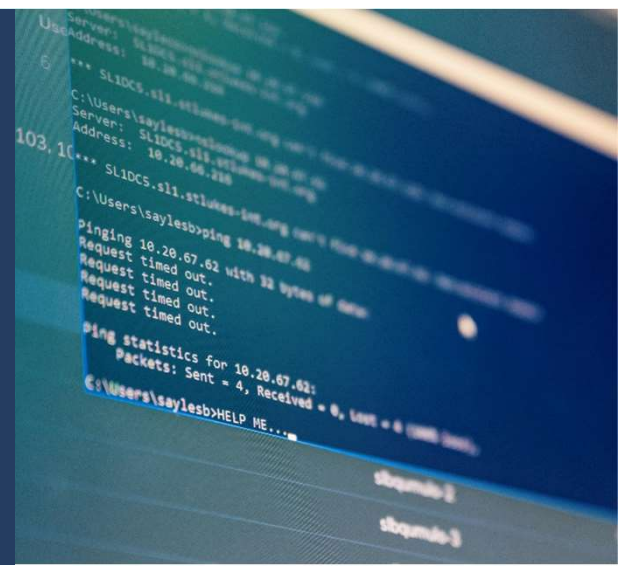
## AGENDA

- General requirements for management systems (based on quality management according to ISO 9001)
- Interrelations of management systems regarding Cyber Security / Software Update Management Systems (SUMS) / Environmental Management / Energy Management / TISAX
- Basics
  - Small and large cone circles
  - Customer / Stakeholder relation
  - Implementing risk-based decision-making
  - Process orientation
  - Roles vs. Positions
  - Audits

## INFO

This training covers the basics of management systems. Starting from the "mother" of all management systems, ISO 9001, the fundamental concepts and the basics of implementation are explained.

The training serves as a foundation for the effective and efficient implementation of management systems in the areas of Quality (e.g., CoPQ), Cyber Security, Software Management Update, Environment, Energy, and TISAX.





- > Presence or Online
- > 8 hours



## TRAINING

# 14. QM: Design processes effectively and efficiently

**Development, acceptance, and implementation of processes in companies**

## AGENDA

- General requirements for processes
- Interconnections of management systems regarding Cyber Security / Software Update Management Systems (SUMS) / Environmental Management / Energy Management / TISAX
- Process Design
  - What is a process?
  - How many processes do we need?
  - When is a process "too big" and when "too small"?
  - Process models
  - Internal and external customer perspective
  - Key figures for effectiveness and efficiency
  - Dealing with interfaces
  - Role model
  - Responsibility of process owners (and stakeholders)
  - Adapting to changed framework conditions / Change management
  - Acceptance in the company



## INFO

This training focuses on process design. The emphasis is on methods that can be used to develop and analyze processes. No standard processes are taught; instead, the focus is on the tools needed to create processes that are optimally suited to the company, widely accepted, supported by the organization, and adaptable to changes.