



## *20° WORKSHOP ON AUTOMOTIVE SOFTWARE & SYSTEMS*

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Carlo Donzella

The new UNECE and EC Regulations in the  
automotive sector: game changers?





# About the Presenter



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ASPICE® Competent Assessor (including Hardware and Cybersecurity extensions)

CFSE™ Certified Functional Safety Expert

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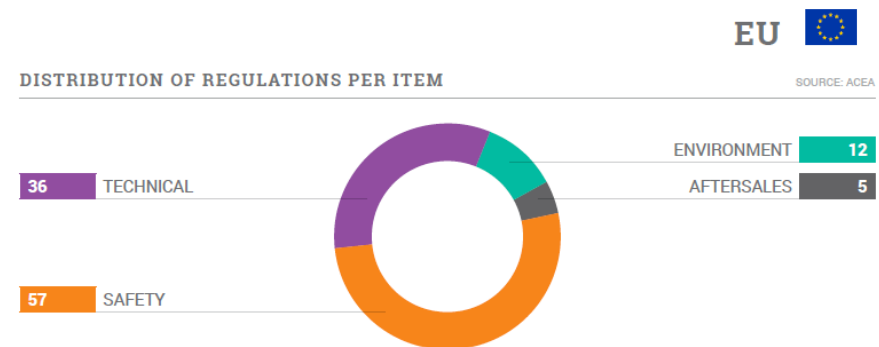
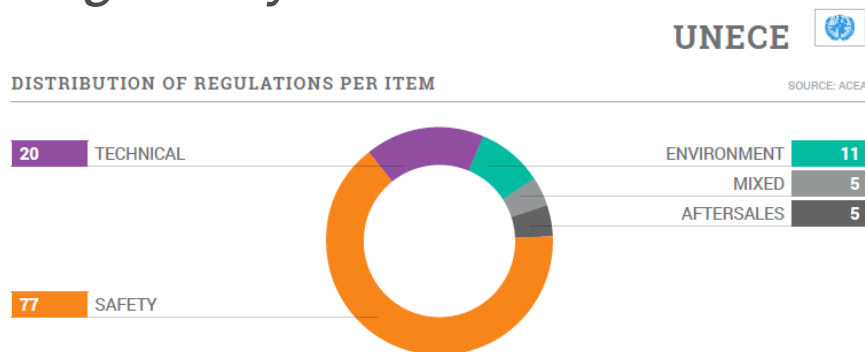
## Projects / Special Interest

Supports automotive customers worldwide in optimizing efforts and developing common procedures to satisfy ASPICE, ISO 26262 and ISO/SAE 21434 models.

Member of the ASPICE HW PRM/PAM Working Group.

Member of the Board of Automotive SPIN Italia.

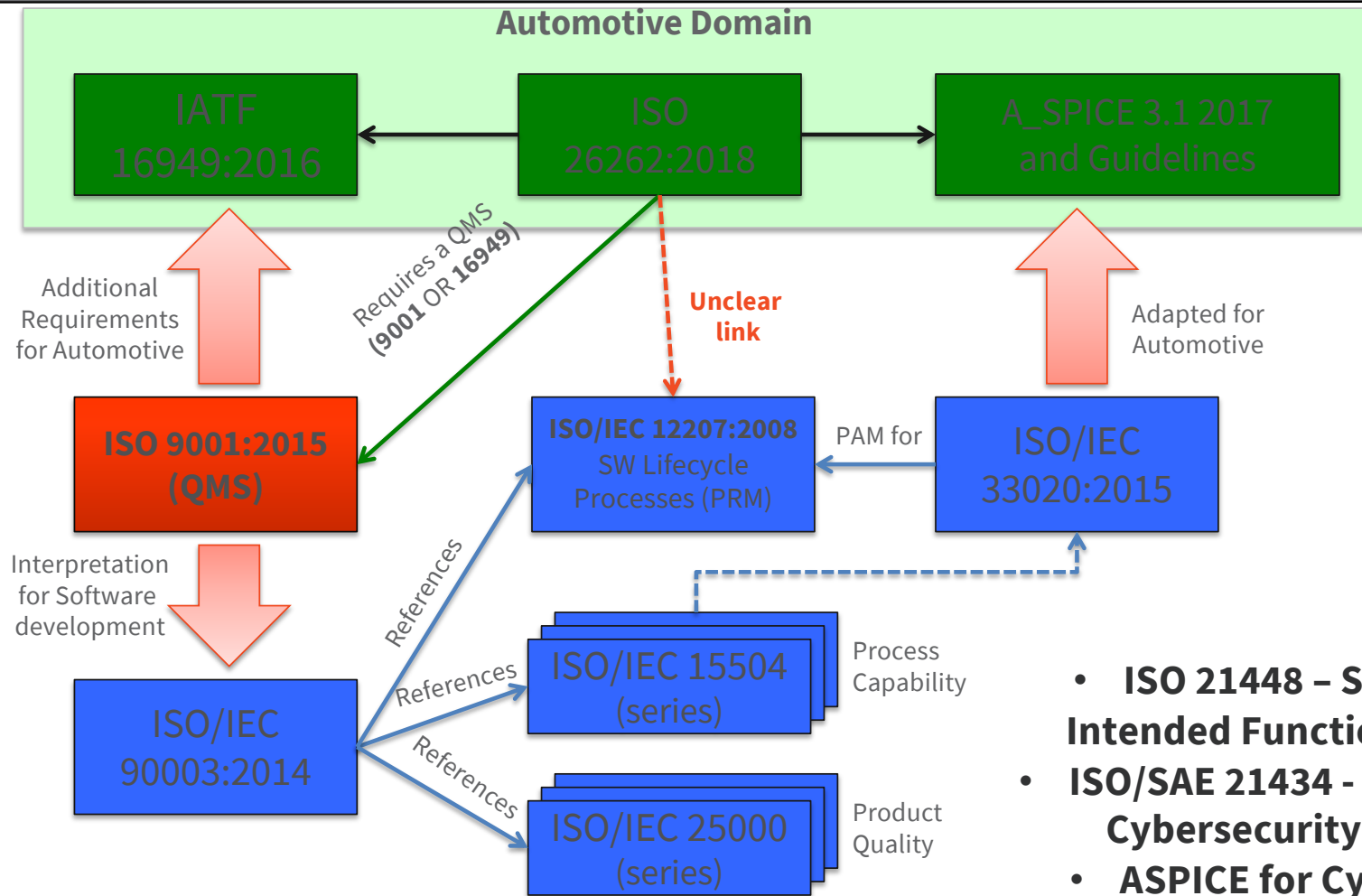
- For many years, the automotive sector has enjoyed a special status among the transportation sectors; that of being largely self-regulated by **technical standard** rather than being controlled by authorities by regulations
- Many regulatory and statutory requirements have indeed existed and were enforced for vehicles to be on the road, e.g., according to ACEA's *Regulatory Guide 2021*:



- However, those were much limited in scope if compared to other sectors such as aerospace and railways (just to mention two cases)



# Map of key reference *standards* in 2019



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- ISO 21448 – Safety of the Intended Functionality (SOTIF)
- ISO/SAE 21434 - Road vehicles: Cybersecurity Engineering
- ASPICE for Cybersecurity



## 2021, the year of the change

- ◆ In 2021, the tide was reverting; the turning point was the publication of **UNECE R155 and R156** on 4 March 2021
- ◆ They establish that significant technical requirements for **Cybersecurity** and for **SW Update Over-The-Air** have to be certified before new vehicles can be 'road-worthy'
- ◆ Those regulations are not that thick (30 and 16 pages) but they are replete **with technical specifications** that have been usually left out of regulatory aspects in automotive
- ◆ UNECE is a UN body but, as the name suggest (**United Nations Economic Commission for Europe**), it's a European-oriented committee



# UN Economic Commission for Europe WP.29

WP.29 is part of the Inland Transport committee

It is a Global Forum for harmonization of vehicle regulations (*cars, vans, trucks, coaches, buses, powered two wheelers, agricultural vehicles and non-road mobile machineries*)

- OEMs need to implement the WP.29 work products for type approvals **in 58 states** (see map)
- USA and Canada are part of UNECE but have the right not to recognize





# Role of UNECE WP.29 regulations

- *UNECE has no \*direct\* global international standing*
- *US: main regulating body is NHTSA (National Highway Traffic Safety Administration)*
- *China has other regulating bodies*

Together, the EU, the Republic of Korea and Japan accounted for some 32 million vehicles produced in 2018, representing just **over one third of global production**

Given the widespread use of UN Regulations in the automotive sector around the world, **broad adoption of UNECE regulations across the world is expected**

Adoption in «strong» legislations – such as e.g. US and PRC – are expected to go through **integration with local regulations**





## What are WP.29/R155 and WP.29/R156?

- ◆ They are not **standards**, they are **regulations**
- ◆ **Technical standards** can be complied with as self-regulation but are not enforced by law (certifications may be regulated but by professional bodies not authorities)
- ◆ **Regulations** are enforced by law
- ◆ OEMs are directly impacted as regulations are affecting capability of selling vehicles: but inevitably all suppliers in their value-chains will feel the cascading effect





# CSMS (UN No. [155]) vs SUMS (UN No. [155])

## CSMS (Cybersecurity Management System)



### CSMS (Cyber Security Management System)

- Such a CSMS must effectively address the supply chain as well

*Supporting ISO standard: **ISO/SAE 21434***

## SUMS (SW Update Management System)



### SUMS (Software Update Management System)

- Software which is part of UNECE regulated systems need to be registered (**RXSWIN (Regulation X Software Identification Number)**)

*Supporting ISO standard: **ISO AWI 24089***

- **Approval Authority** (to award certificate)
  - **checking evidences** (provided by OEM) like test reports, threat modelling reports, due diligence, etc.
  - shall verify by testing of a vehicle if the OEM has implemented the cyber security measures → National Approval Authorities or Technical Service providers, listed by UNECE.
- **Regulations are mandatory** for an OEM to place their vehicles on UNECE subscriber market.

- ◆ A **draft** of **Regulation 2019/2144** governing “*modern technologies used in vehicles, including specific requirements for automated and fully automated (“driverless”) vehicles and the systems they employ, to ensure that they are safe to use*”, was published on **07 April 2022**
- ◆ Draft included 70 pages of TA; 80 comments from key European and worldwide industrial and academic players collected in few weeks
- ◆ **Final regulation 2019/2144** actually published on **06 July 2022**, *supplementing (not substituting) original regulation\**
- ◆ The Regulation introduces **new rules on road safety** and establishes the **legal framework for the approval of automated and fully driverless vehicles** in the EU
- ◆ Some of its key elements are introduced in the next slides (*\*disclaimer: only original texts and annexes are to be considered as references!*)

## EC is assisted by Technical Committee Motor Vehicles (TCMV)

- ◆ For preparation and management of of **Regulation 2019/2144**, EC is assisted by Technical Committee Motor Vehicles (TCMV)
- ◆ The Committee Code is C35300
- ◆ It operates under DG GROW “*EC Directorate General on Internal Market, Industry, Entrepreneurship and SMEs*”
- ◆ It has contributed to 13 Legal Acts
- ◆ It has met 121 times, starting from 2009 (*quite well-established committee*)
- ◆ No further public information available
  - source: <https://ec.europa.eu/transparency/comitology-register/screen/committees/C35300/consult?lang=en>

- ◆ 40 pages, 35 whereases, 26 definitions, 19 articles, 3 annexes
- ◆ new definitions rules on road safety
- ◆ foundation for the new legal framework on automated vehicles

- ◆ Basic safety features that shall be installed in any type of road vehicle: intelligent speed assistance, reversing detection with camera or sensors, attention warning in case of driver drowsiness or distraction, event data recorders, emergency stop signal
- ◆ Cars and vans will need, in addition, other safety features such as lane keeping systems, automated braking
- ◆ Buses and trucks will also need to be equipped with additional safety features, such as technologies for better recognising possible blind spots, warnings to prevent collisions with pedestrians or cyclists, tyre pressure monitoring systems

- ◆ the Regulation does not directly set out the ***technical rules for automated vehicles***, but delegates this power to the Commission
- ◆ the Commission will be required to prescribe technical rules concerning:
  1. *systems to replace the driver's control of the vehicle, including signalling, steering, accelerating and braking*
  2. *systems to provide the vehicle with real-time information on the state of the vehicle and the surrounding area*
  3. *driver availability monitoring systems*
  4. *event data recorders for automated vehicles*
  5. *harmonised format for the exchange of data for instance for multi-brand vehicle platooning*
  6. *systems to provide safety information to other road users*

## Regulatory landscape would not be complete without...

- ◆ ...at least mentioning ethics initiatives on AI
- ◆ EC published the seminal ***Ethics guidelines for trustworthy AI*** in April 2019
- ◆ German Federal Ministry for Justice and Consumer Protection followed suit, with ***Opinion of the Data Ethics Commission*** in October 2019
- ◆ None of these documents is singling out automotive sector but uncertainty and challenges related to autonomous driving have been instrumental to kick them off, and are primary subjects for the guidelines
- ◆ *As per today, no direct regulations is enforcing them yet (although the influence of their principles is evident on some of the examined Regulations)*

## Why so much direct intervention by UNECE and EC?

- ▶ from isolated cars to networked vehicles in complex infrastructures
- ▶ emergence of vulnerable road users protection beyond vehicle passengers
- ▶ clash between unruly newcomers and established players, undermining self-regulation
- ▶ ...



## Some preliminary conclusions

- ◆ The 'tsunami' of new regulations is ***not only quantitative, but qualitative***: compliance to a technical standard is quite different than to a regulation (the management of “Statutory and Regulatory Requirements” is already an headache even for traditional QMS)
- ◆ Automotive sector is already struggling with ***overwhelming projects complexity*** and widening scope of required ***competences***
- ◆ ***Roadmap*** to new regulations compliance, with dates set by law, ***is not (no longer just) in the hands of industry but (mostly) in those of the lawmakers***: that's a paradigm shift...



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**Many Thanks for Your Attention**

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