2020 스마트시티 국가표준코디네이터

표준기반 R&D추진전략 성과보고회

국가기술표준원
Korean Agency for Technology and Standards

KSA 한국표준협회

자율주행차 안전/보안 표준 동향

백 재 원

(사)한국첨단자동차기술협회

목 차

자율주행차 안전/보안 관련 규제 및 표준

I-1 자율주행차 안전/보안 관련 규제 및 표준의 목표

"Safety & Cybersecurity" for Automated Driving

UNECE

WP.29 GRVA
TFCS

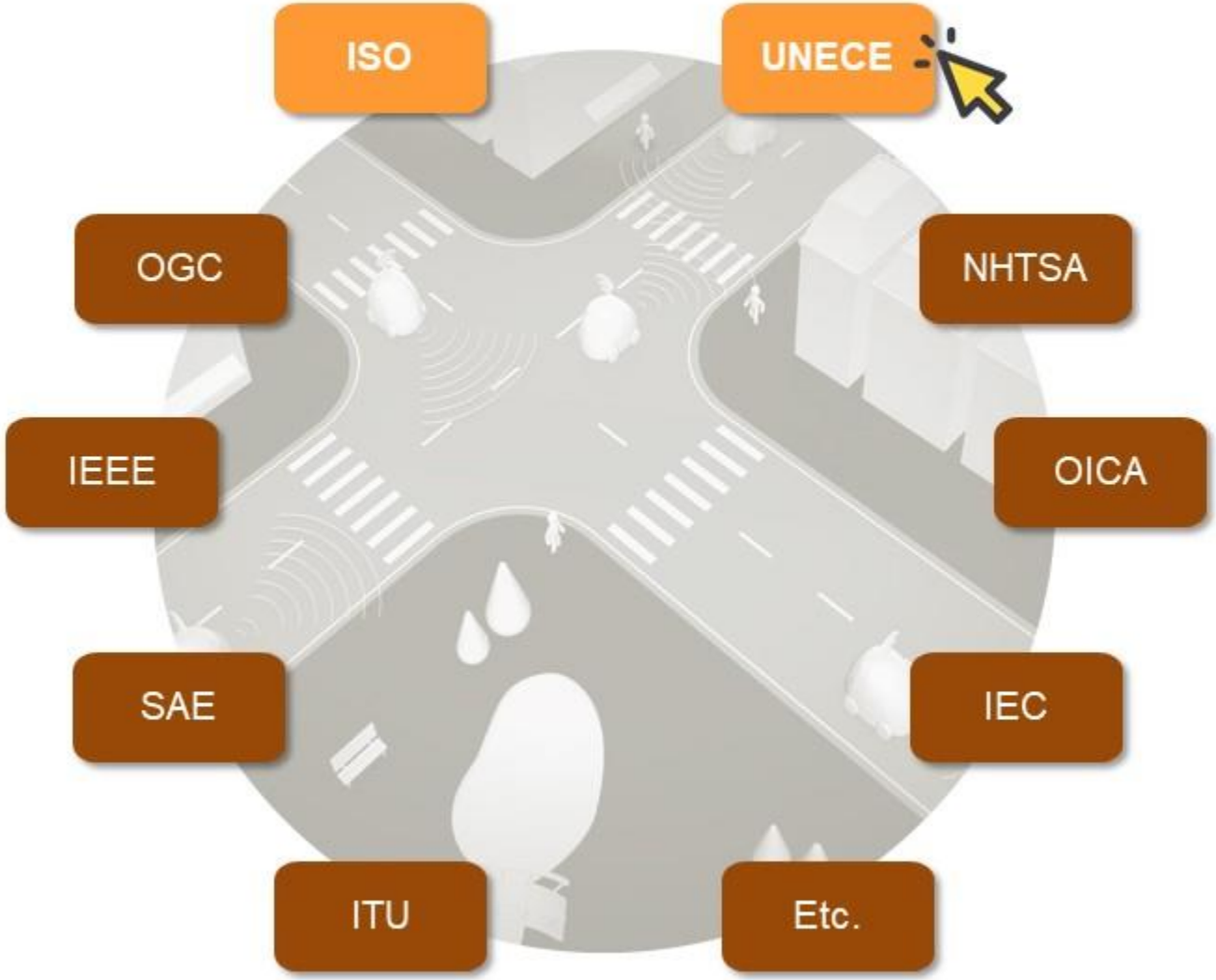
ISO

ISO/TC 22/SC 32
ISO 26262, ISO 21448,
ISO 21434, ISO 24089,
ISO 5112

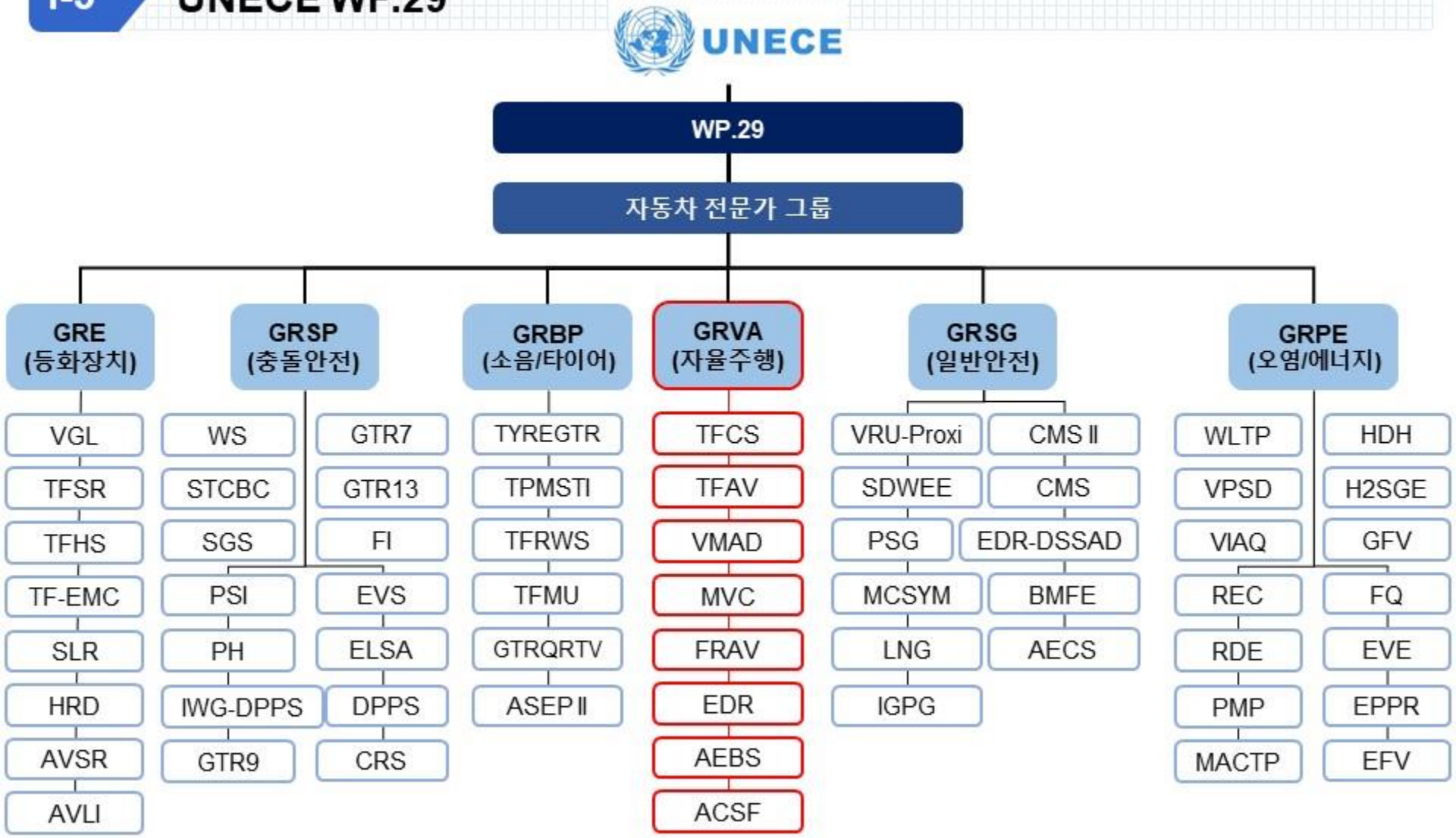
ISO

ISO/TC 22
TR 4804

I-2 자율주행차 관련 주요 표준화 기구



I-3 UNECE WP.29



I-4 ISO/TC 22/SC 32

TC 22
Road vehicles

ISO

934개 표준 제정
(270개 표준 제정중)

SC 32 Electrical and electronic components and general system aspects

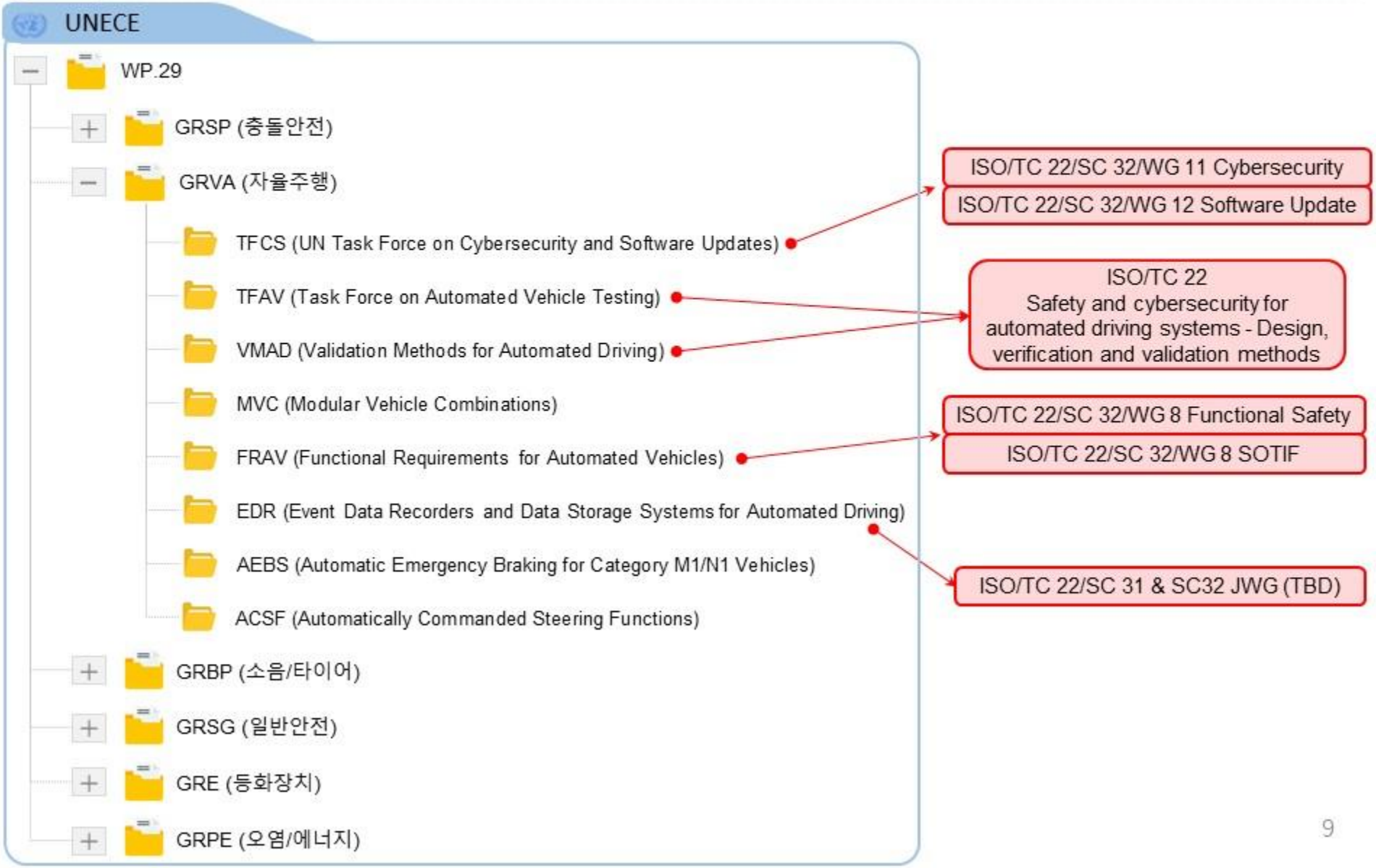
SC 31 | SC 32 | SC 33
SC 34 | SC 35 | SC 36
SC 37 | SC 38 | SC 39
SC 40 | SC 41 | AG 1 | SAG

총 74개의 WG이 운영되고 있음

REFERENCE	TITLE
WG 1	Ignition Equipment
WG 2	Environmental conditions
WG 3	Electromagnetic compatibility
WG 4	Automotive electrical cables
WG 5	Fuses and circuit breakers
WG 6	On-board electrical connections
WG 7	Functional characteristics of starting devices and electrical generators
WG 8	Functional safety
WG 9	Electrical connections between towing and towed vehicles
WG 10	Optical components - Test methods and requirements
WG 11	Cybersecurity
WG 12	Software update

2020.05 기준

I-3 UNECE – ISO mapping

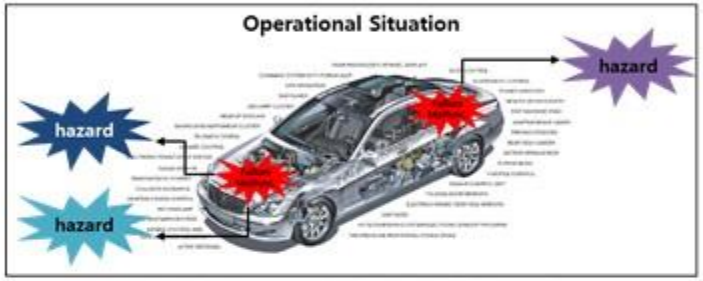


자율주행차 안전/보안 관련 주요 표준

II-1 Functional Safety & SOTIF (1/4)

ISO 26262 Functional Safety (2nd edition)

- **Functional Safety**
  - Absence of unreasonable risk due to hazards caused by malfunctioning behaviour of E/E systems



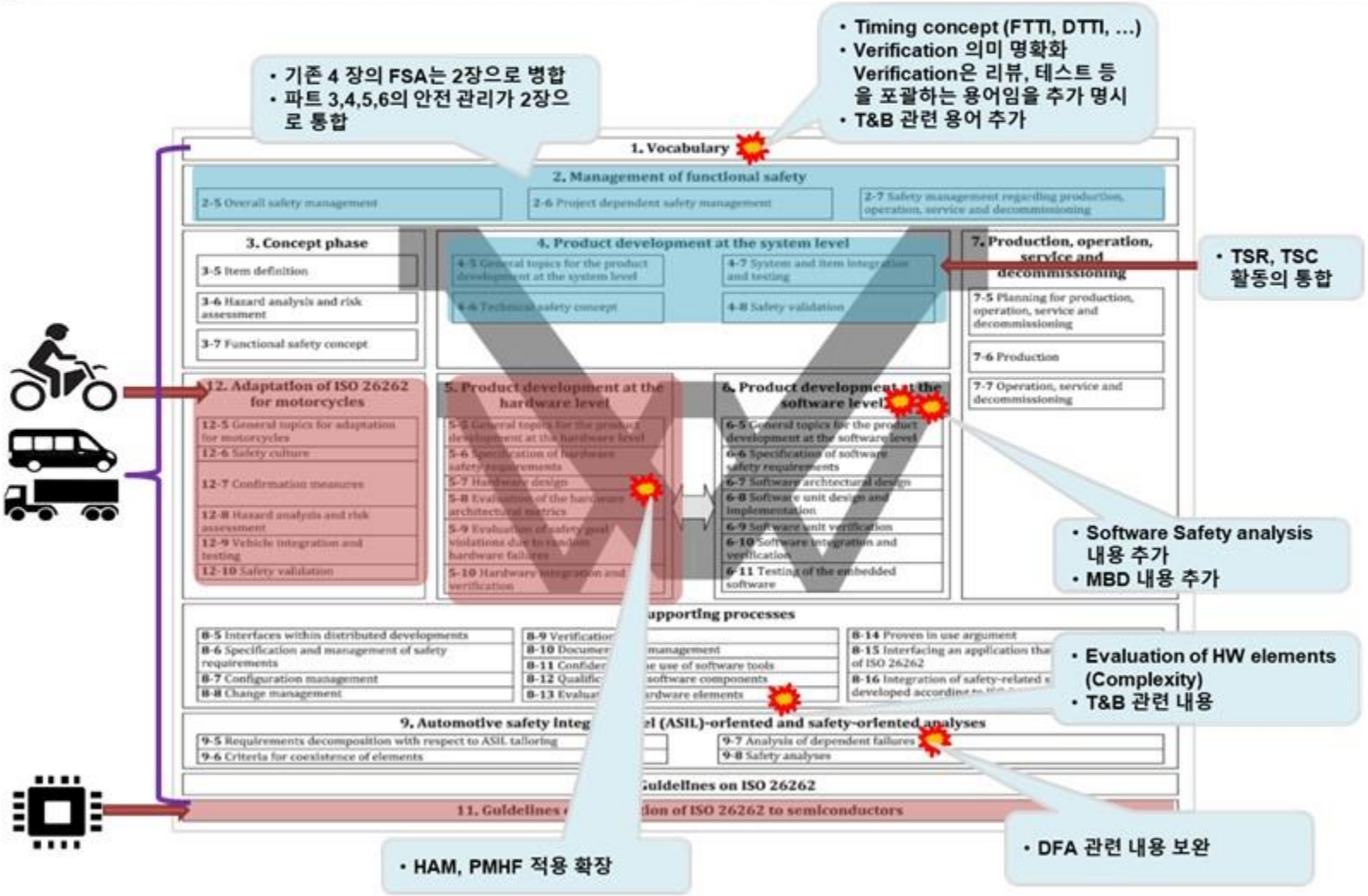
Hazardous event := Combination_(OS, Hazard)
Severity?
Exposure?
Controllability
→ Safety Goal and its ASIL of Item
→ Functional Safety Concept

- **Unreasonable Risk**
  - risk judged to be unacceptable in a certain context according to valid societal moral concepts

- **Malfunctioning Behaviour**
  - failure or unintended behaviour of an item with respect to its design intent

- **E/E System**
  - System that consists of electrical and/or electronic elements, including programmable electronic elements

II-1 Functional Safety & SOTIF (2/4)



II-1 Functional Safety & SOTIF (3/4)

ISO 21448 SOTIF(Safety of the intended functionality)

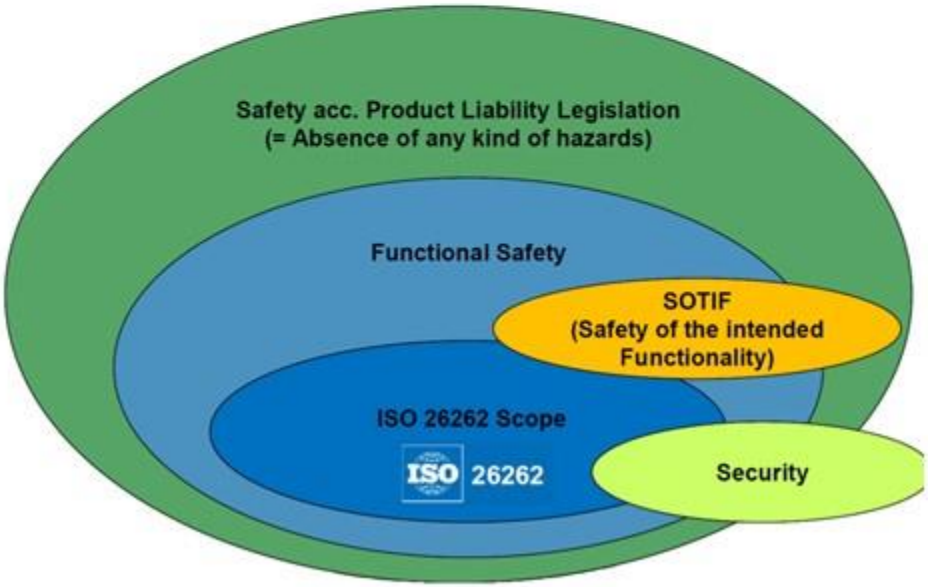
00	10(NP)	20(WD)	30(CD)	40(DIS)	50(FDIS)	60(IS)
예비단계 Preliminary stage	제안단계 Proposal stage	준비단계 Preparatory stage	위원회단계 Committee stage	질의단계 Enquiry stage	승인단계 Approval stage	출판단계 Publication stage

2018-12-07 현재 2022년 2월 목표

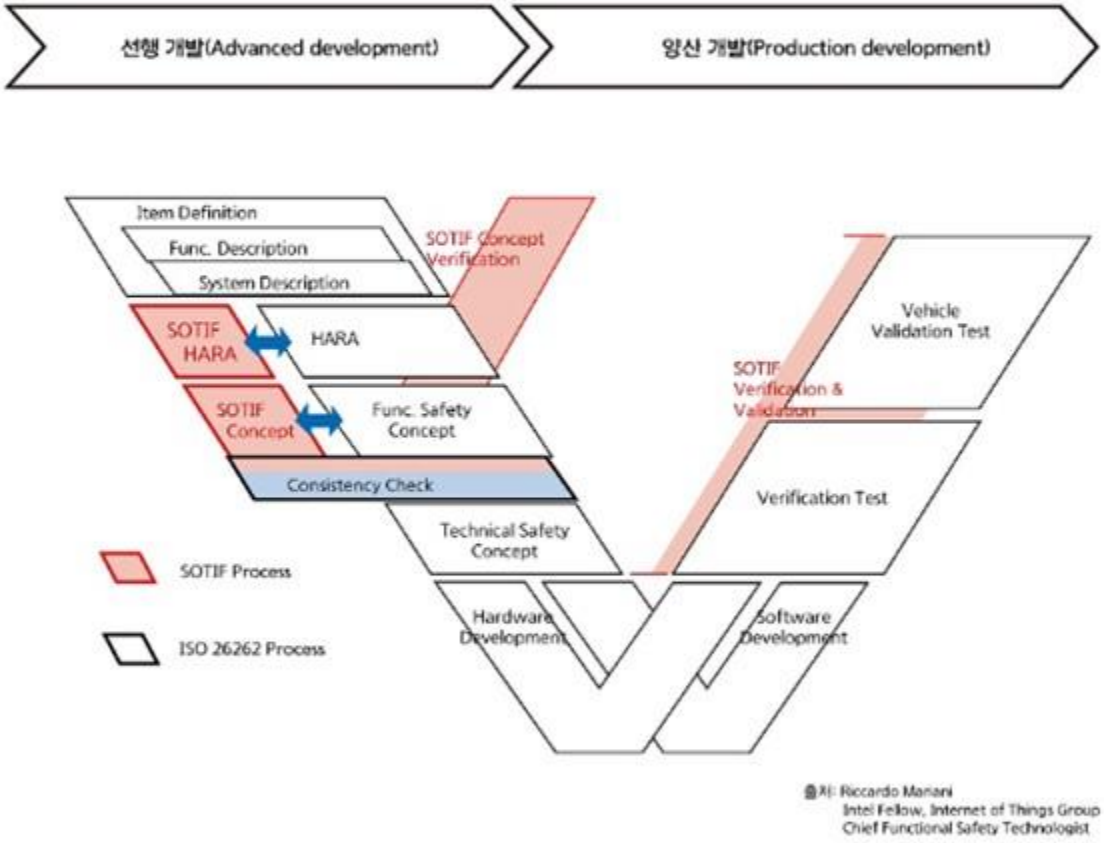
★ 진행 현황

- 총 10개의 ST(Sub Team) 운영중

ISO 26262 covers only a subset of safety



II-1 Functional Safety & SOTIF (4/4)



<SOTIF Development Process Overview>

II-2 Cybersecurity (1/4)

ISO 21434 Cybersecurity engineering

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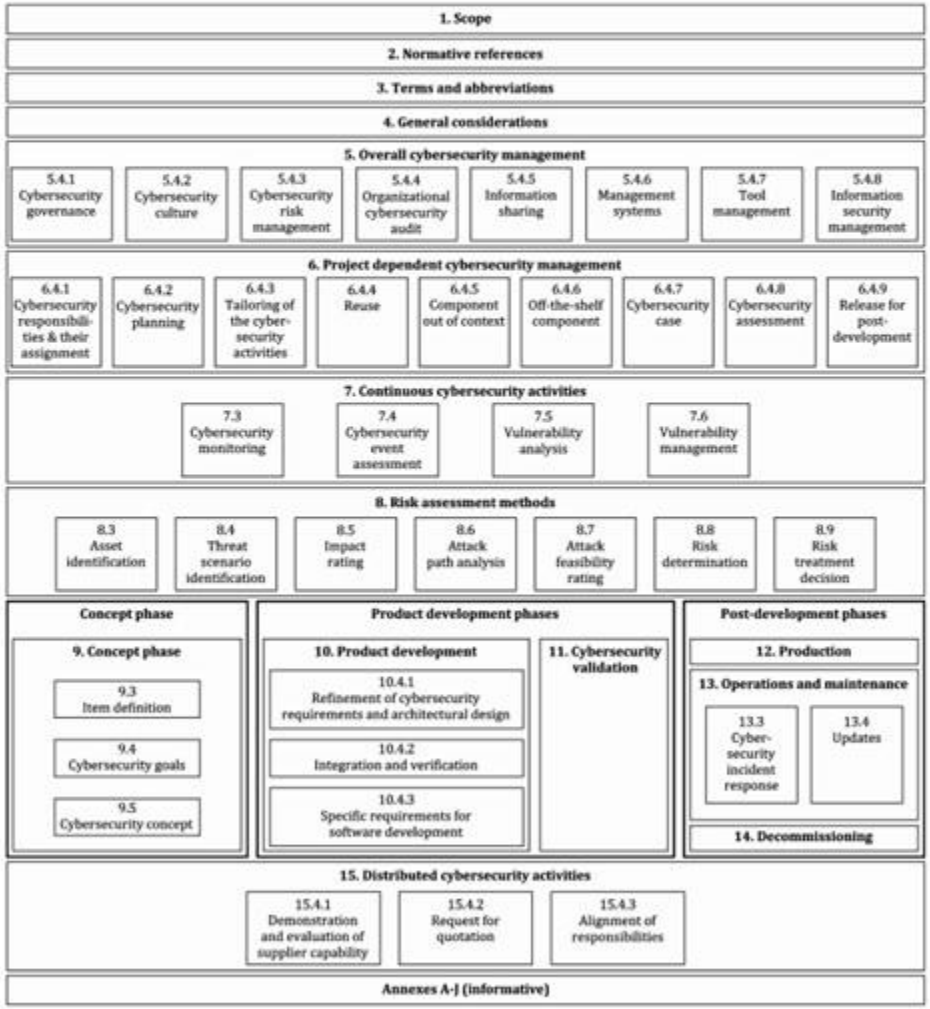
예비단계 Preliminary stage	제안단계 Proposal stage	준비단계 Preparatory stage	위원회단계 Committee stage	질의단계 Enquiry stage	승인단계 Approval stage	출판단계 Publication stage

2016-01-30 현재 2020년 말 목표

ISO 21434 Cybersecurity engineering			
PG 1	PG 2	PG 3	PG 4
Risk Management	Product Development	Operations, Maintenance and Other Processes	Process Overview and Interdependencies

II-2 Cybersecurity (2/4)



II-2 Cybersecurity (3/4)

ISO NP 5112 Guidelines for auditing cybersecurity engineering

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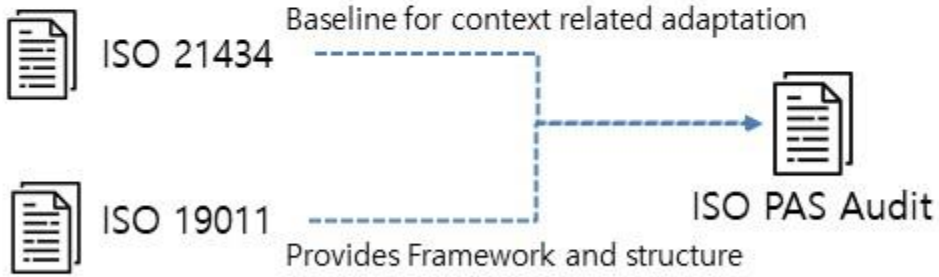
예비단계 Preliminary stage	제안단계 Proposal stage	준비단계 Preparatory stage	위원회단계 Committee stage	질의단계 Enquiry stage	승인단계 Approval stage	출판단계 Publication stage

2020-03-05 현재 2021년 5월 말 목표

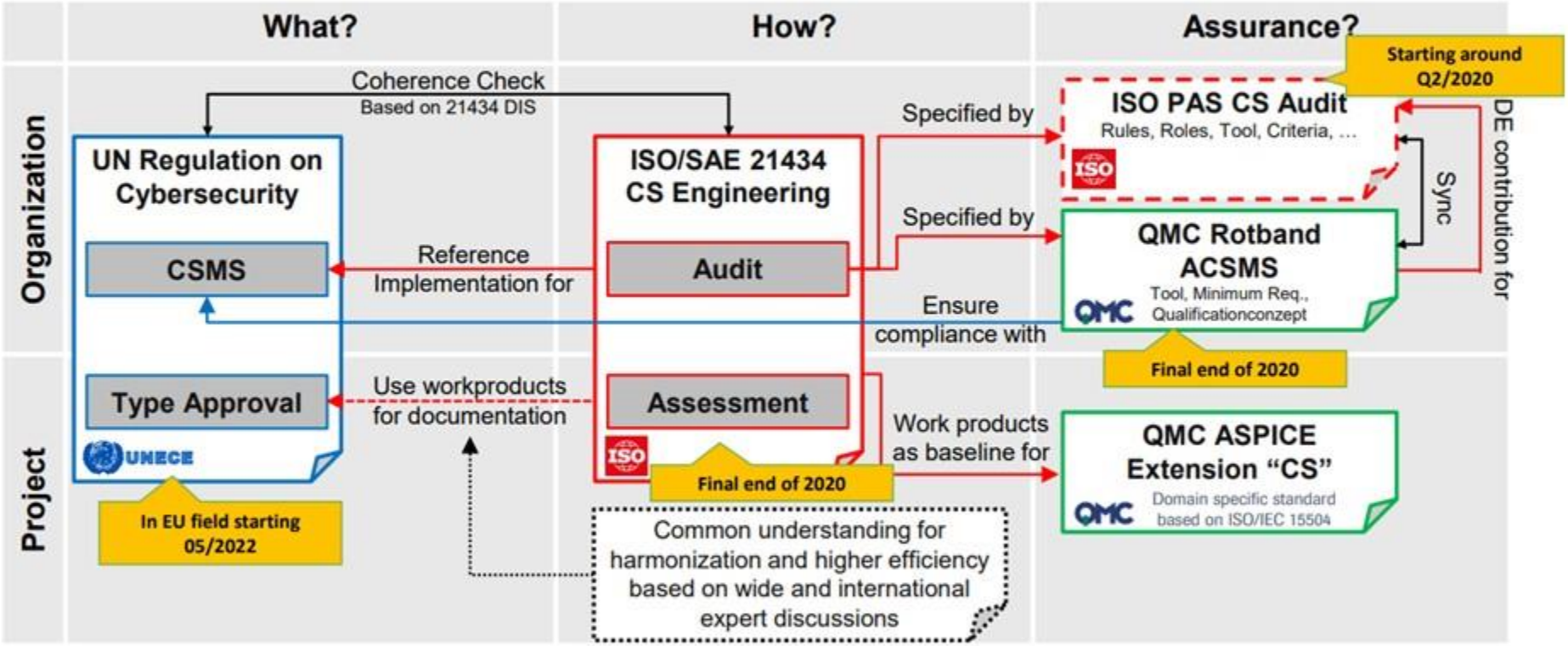
★ 문서 구조



★ 개발 일정

- NP vote: ~5/6
- Kick-off meeting: 5/28
- WD: 7/31
- CD ballot: 2021/01/29
- Publication: 2021/05/31

II-2 Cybersecurity (4/4)



II-3 Software Update Engineering

ISO 24089 Software update engineering

00	10(NP)	20(WD)	30(CD)	40(DIS)	50(FDIS)	60(IS)
예비단계 Preliminary stage	제안단계 Proposal stage	준비단계 Preparatory stage	위원회단계 Committee stage	질의단계 Enquiry stage	승인단계 Approval stage	출판단계 Publication stage

2019-01-21 현재 2022년 3월 목표

★ 진행 현황

- Terminology TF, Restructuring TF

1. Scope			
2. Normative references			
3. Terms and definitions			
4. Management activities			
5. Design and development of infrastructure for software update	6. Design and development of update-capable vehicles and components	7. Package development	8. Operations

<ISO 24089 개요>

ISO/TC 22 신규 프로젝트

ISO TR 4804 "Road vehicles –

Safety and cybersecurity for automated driving systems –

Design, verification and validation methods"

III-1 TC 22 신규 프로젝트 – TR 4804

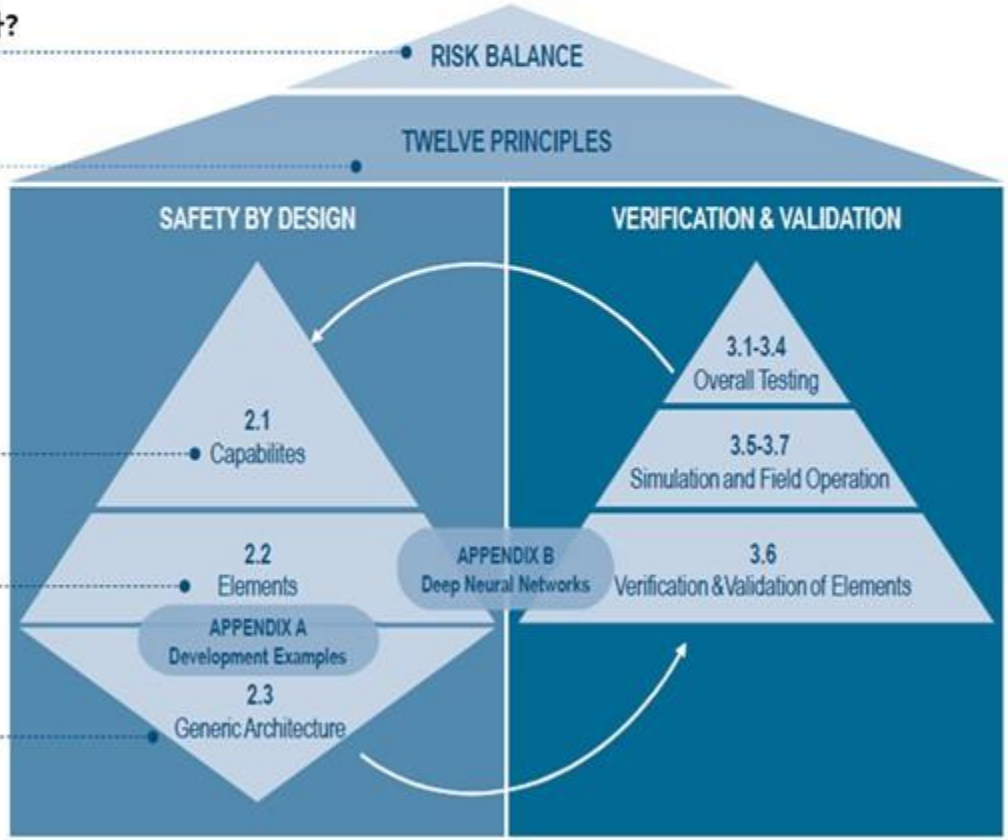
- This is regarded as a long term ISO standardization activity for Safety and Cybersecurity for Automated Driving Systems
- The intl. working group shall be formed now and jointly proceed down the standardization road.
- Standardization of the state-of-the-art shall take place in parallel with the product developments of the contributing expert's companies.
- This activity is regarded as a application specific standardization for automated driving based on generic underlying standards like ISO 26262 (functional safety), ISO 21448 (SOTIF) , ISO 21434(automotive cybersecurity) and others, see ISO DTR 4609 (Road vehicles — Report on standardization prospective for automated vehicles (RoSPAV))

Focused on
"Automated Driving System"
(Level 3, 4 System)

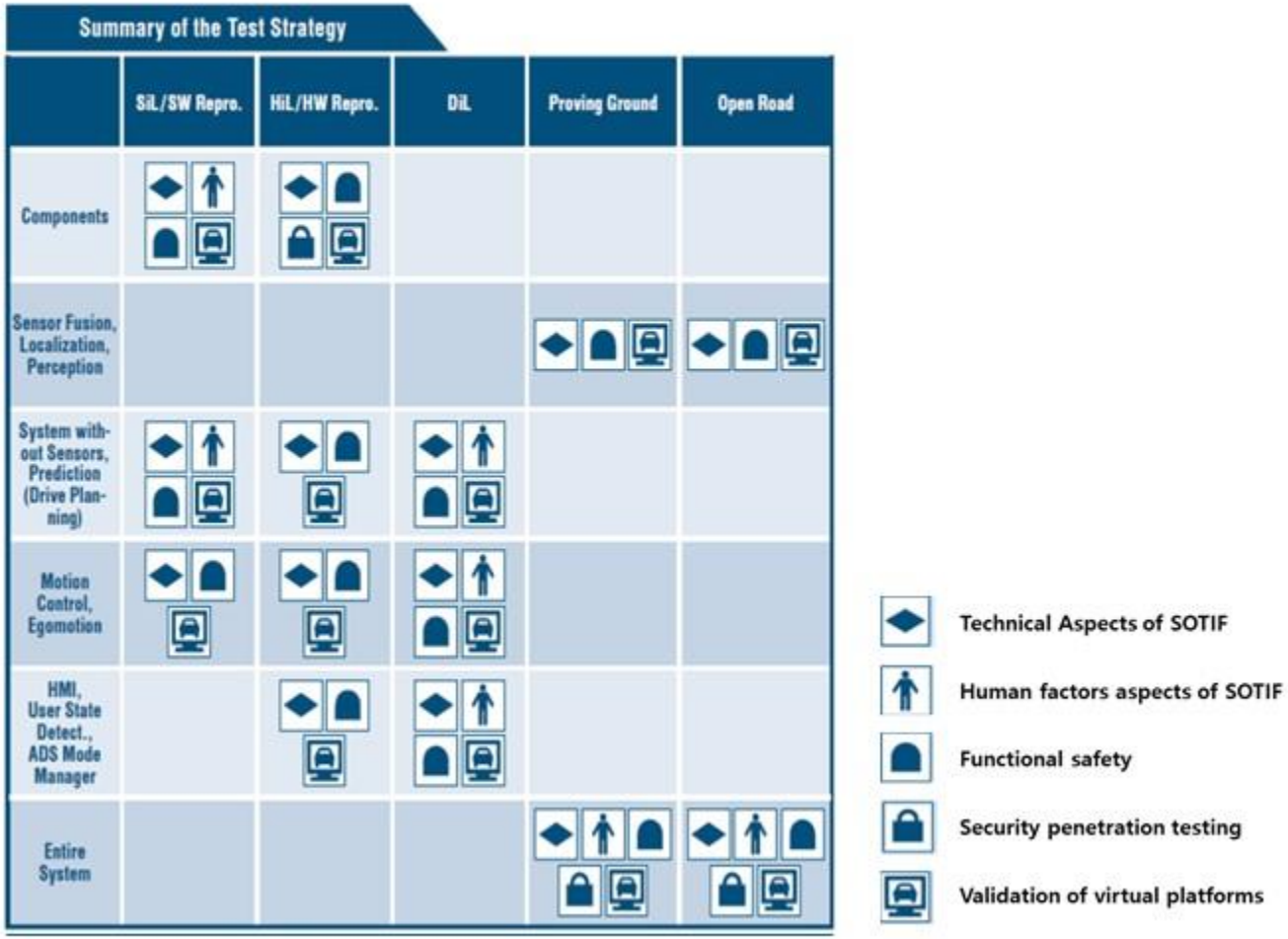
III-2 TR 4804 구조

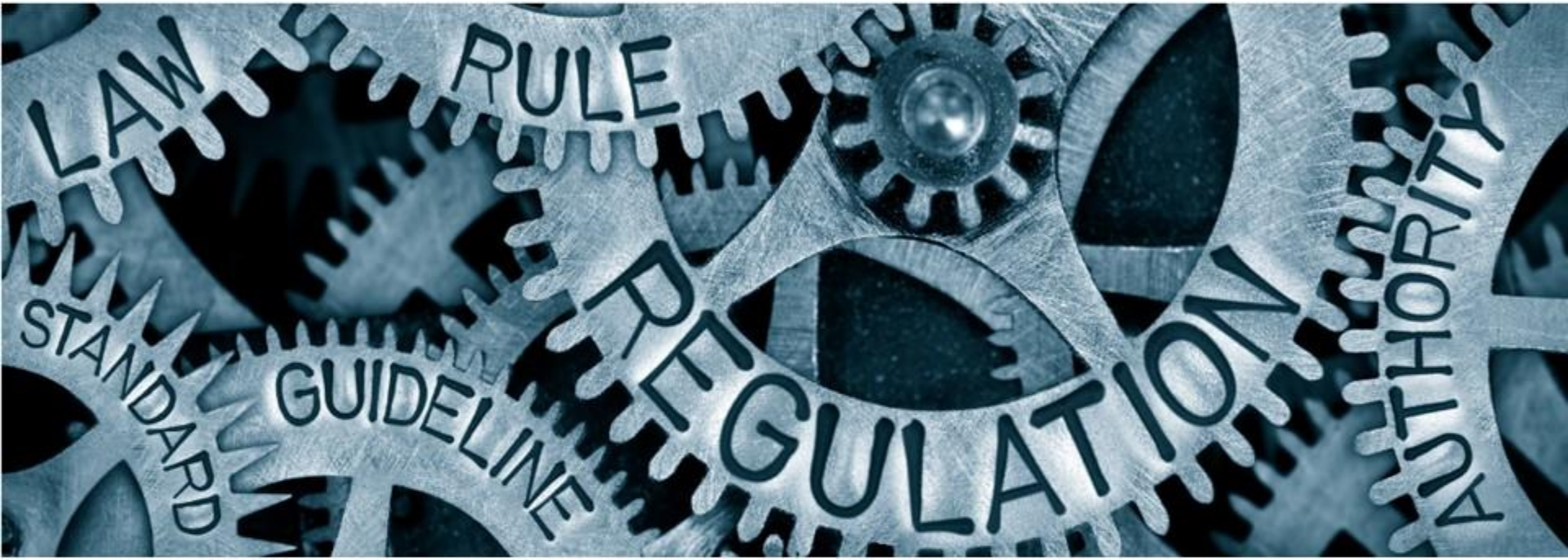
THINKING SAFETY FROM THE TOP DOWN – FROM RISK BALANCE TO IMPLEMENTATION

1. L3/L4 시스템이 얼마나 안전해야 하나?
2. 안전목표를 달성하기 위해 필요한 것은 무엇인가?
3. 위의 관점을 달성하기 위한 어떤 개념이 필요인가?
4. 개념을 구현하기 위해 어떤 Block이 필요한가?
5. 어떻게 이런 Block을 기반으로 일반적인 아키텍처 설계를 할 것인가?



III-3 Verification & Validation - Summary of the test strategy





감사합니다.