



Proposed Interpretation Document to complement UNR157 and amendment of Appendix 2

4th Session of the ALKS Special Interest Group

14-15 April, 2021

UNR157

Annex 4

3. Documentation

- *The manufacturer shall provide a documentation package [...]*
- *Documentation shall be made available in **three parts**:*
 - *The **information document** which is submitted [...] at the time of type approval application shall contain brief information on the items listed in Appendix 2 [...]*
 - *The formal documentation package for the approval, containing the material listed in this paragraph 3 [...]*
 - *Additional confidential material and analysis data (intellectual property) [...] which shall be retained by the manufacturer but made open for inspection [...]*

UNR157

Annex 4 - Appendix 2: Information Document

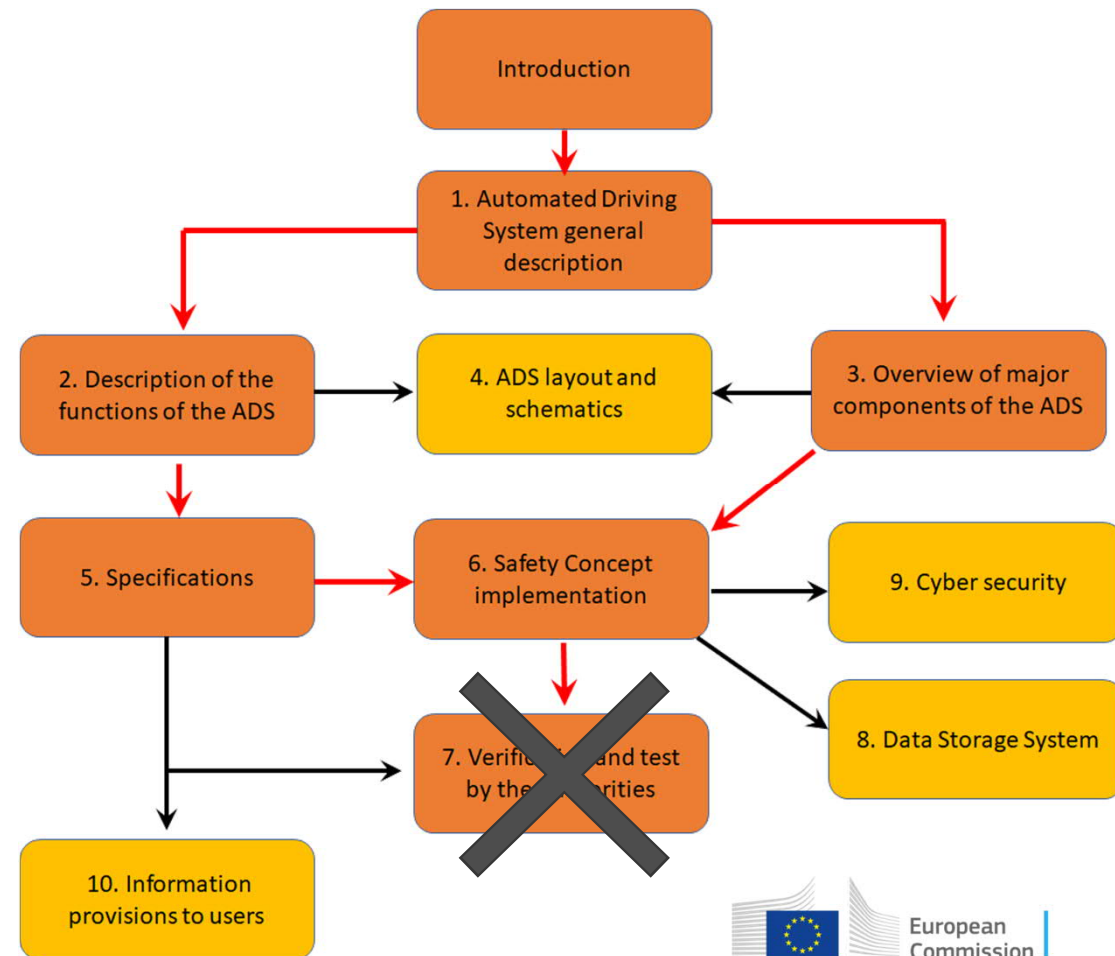
1. System description Automated Lane Keeping System
2. Description of the functions of “The System” including control strategies
3. Overview major components (units) of “The System”
4. System layout and schematics
5. Specifications
6. Safety Concept
7. Verification and test by the authorities
8. Data Storage System
9. Cyber security (cross reference to the cyber regulation is possible)
10. Information provisions to users

UNR157-04-06: Interpretation Document (1/4)

- The Information Document (ID) is already close to a **Safety Report**
- It can contain all the necessary information for the assessment at the approval ("*formal documentation package for approval*"), except the confidential material
- It can be updated to reflect major modifications to the ADS
- The level of detail contained in the ID can vary and can be agreed with the authority beforehand (e.g. can vary from extensive and detailed description of analysis and tests, to a summary with results provided in aggregated form)
- An **Interpretation document** providing guidelines on the format and content of the Information Document to complement the Regulation and ensure a standardized approach from both manufacturers and authorities
- A separate **Assessment Report** should be issued by the authority containing the results of the ID assessment and of the verification tests

UNR157-04-06: Interpretation Document (2/4)

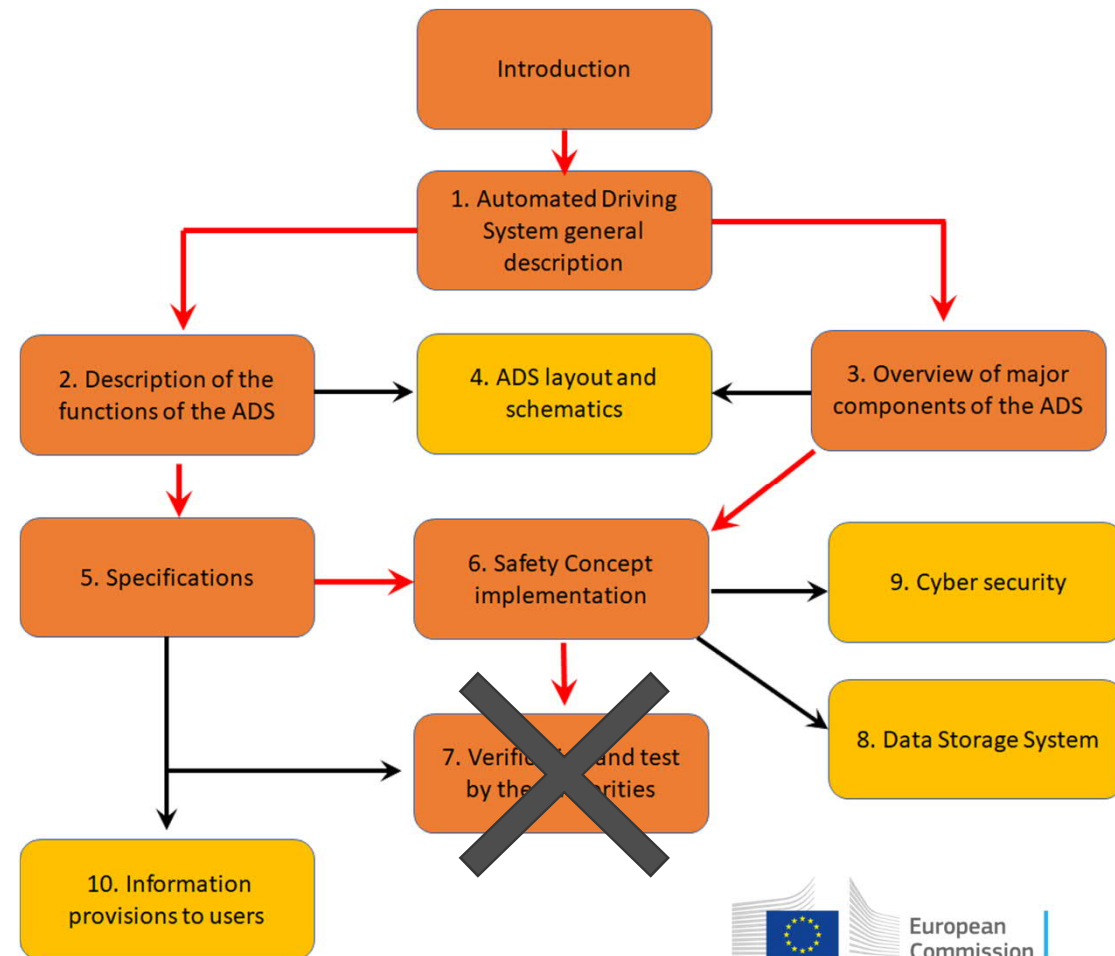
- Introduction
- 1. **general description** of the ADS, the definition of the ODD (§1.1), of the basic performance of the vehicle (§1.2) and of the means to activate, override or deactivate the ADS (§1.3);
- 2. vehicle-internal (§2.1) and vehicle-external **functions** (§2.1), as well as the **control strategies** (§2.3);
- 3. **hardware** relevant to the ADS: control units (§3.1), sensors (§3.2), actuators (§3.3) and other hardware (§3.4);
- 4. **schemes, layouts** and flowcharts of systems (§4) and sub-systems (§4.1), as well as their interfaces (§4.2);
- 5. ADS specifications in **Normal** (§5.1) and **Emergency Conditions** (§5.1), the acceptability criteria (§5.3) and the demonstration of compliance with those criteria (§5.4);



UNR157-04-06: Interpretation Document (3/4)

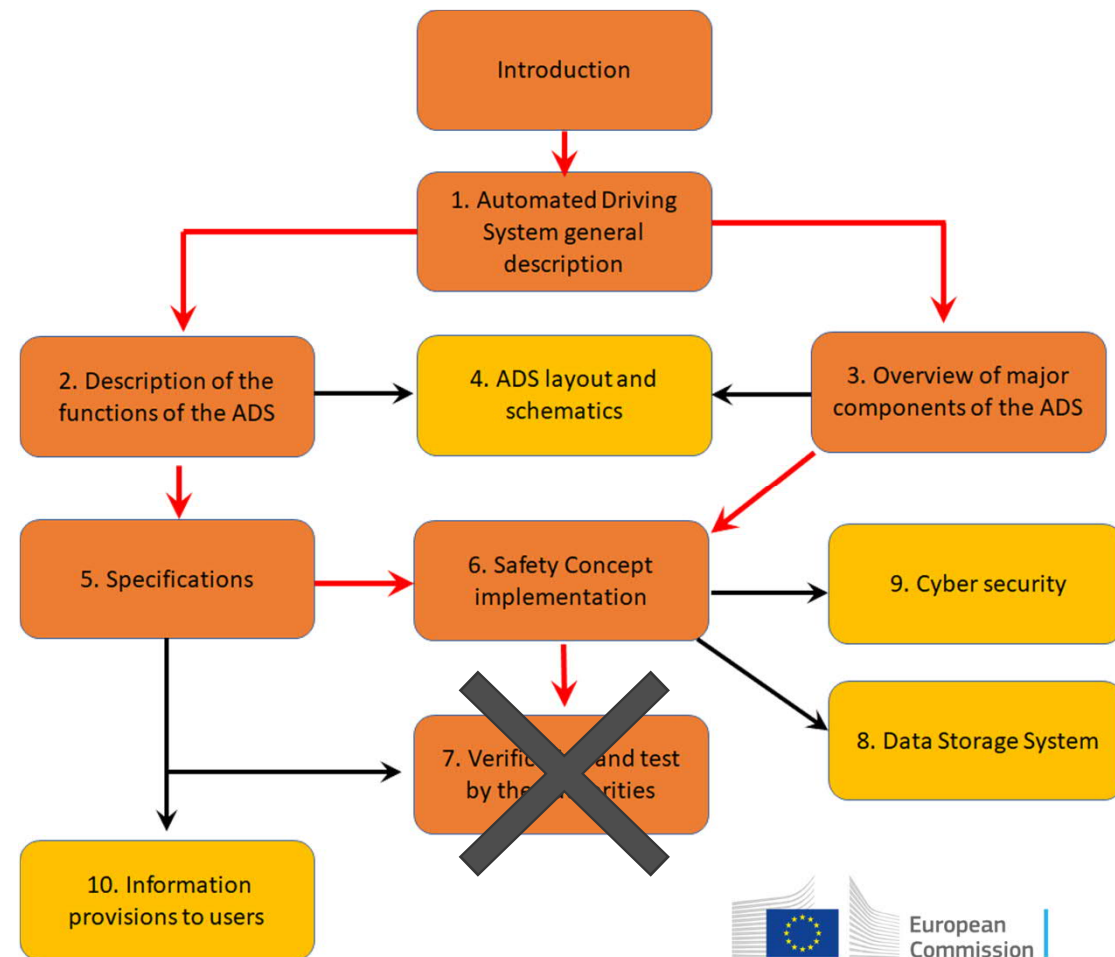
6. implementation of the **safety concept**, i.e. the approaches adopted to assure the safety of passengers and other road users, as well as compliance with road rules, starting from the definition of safety objectives. The Section includes the manufacturer statement (§6.1), the description of software architecture (§6.2) and hardware solutions (§6.3) adopted to achieve the safety objectives, system self-diagnostics and main design provisions adopted to obtain safe operation (§6.4), transition demand (§6.5), human-machine interface (§6.6), protection against simple unauthorized interventions (§6.7), validation and verification by the manufacturer (§6.8);

~~7. **verification and tests performed by the authorities** to assess both the vehicle safety functions (§7.1) and the vehicle behaviour when facing failures, operational disturbance, boundary and emergency conditions (§7.2)~~



UNR157-04-06: Interpretation Document (4/4)

8. **data storage system** in terms of type of data stored (§8.1), storage location and crash survivability (§8.2), data recorded during vehicle operation and occurrences (§8.3), data security and protection against unauthorized access or use (§8.4), means and tools to carry out authorized access to data (§8.5);
9. **cyber security aspects**, namely: *cyber security and software update management (§9.1), identification of risks, mitigation measures, secondary risks and assessment of residual risk (§9.2), software update procedure and management put in place to comply with legislative requirements (§9.3);*
10. **information provided** to the users to let them be properly informed about their responsibilities,; it includes models of the information provided (§10.1), as well as excerpts from owner's manual (§10.2).



UNR157-04-05: Proposed modifications to the Information Document structure (1/3)

- Definitions and acronyms should be part of **INTRODUCTION** (now missing);
- **GENERAL** introductory sub-section should be added to each section;
- In **Section 1**, the general description of the system should be the first sub-section 1.1., before the ODD description;
- **Section 4** should come before the description of components in 2 (SFTW) and 3 (HDW)
- New subsections suggested for **Section 5**: Spec. in normal conditions, Spec. in emergency conditions, acceptability criteria, demonstration of compliance;
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UNR157-04-05: Proposed modifications to the Information Document structure (2/3)

- Original subsections 5.1 (Means to check the correct operational status of the system) and 5.2 (Means implemented to protect against simple unauthorized activation/operation and interventions into the system) moved to **Section 6**;
- Modified subsections suggested for **Section 6**;
- Section 6.7 on Validation & Verification should/could be a separate chapter
- New subsection in Section 6 on tools and tool-chains description and validation (input from VMAD-SG2*)
- Desirable to delete **Section 7**

VMAD-SG2 work on simulation and virtual testing

- The prominent role of simulation and virtual testing in ADS validation has been acknowledged by VMAD
- Still the issue of virtual tool chain credibility needs to be addressed.
- Next steps in VMAD-SG2 (timeframe June 2021):
 - criteria for virtual tool-chain validation;
 - ***documentation requirements for vehicle manufacturers**

UNR157-04-05: Proposed modifications to the Information Document Structure (3/3)

6. Safety Concept

- 6.1. Safe Operation – Vehicle Manufacturer Statement
- 6.2. Outline software architecture (e.g. block diagram)
- 6.3. Means by which the realization of the system logic is determined
- 6.4. General explanation of the main design provisions built into "The System" so as to generate safe operation and interaction with other road users under fault conditions, under operational disturbances and the occurrence of planned/unplanned conditions that would exceed the ODD.
- 6.5. General description of failure handling main principles, fall-back level strategy including risk mitigation strategy (minimum risk manoeuvre)
- 6.6. Driver, vehicle occupants and other road users interaction including warning signals and transition demands to be given to driver.
- 6.7. Validation by the manufacturer for the performance requirements specified elsewhere in the regulation including the OEDR, the HMI, the respect of traffic rules and the conclusion that that the system is designed in such a way that it is free from unreasonable risks for the driver, vehicle occupants and other road users

6. Safety Concept Implementation

- 6.1. Vehicle Manufacturer Safety Statement =
- 6.2. Software Architecture =
- 6.3. Means by which the Realization of the ADS Logic is Determined =
- 6.4. Main Design Provisions for Safe Operation
Ex 5.1 + 6.4 + 6.5
- 6.5. Transition Demand part of . 6.6
- 6.6. Human-Machine Interface part of 6.6
- 6.7. Protection against Simple Unauthorized Activation/Operation and Interventions Ex 5.2
- 6.8. Validation and Verification by the Manufacturer =6.7

Thank you



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