

C. Section [4.2 (GTR) / 6.2(UNR)] – Interaction between the ADS and its User(s)

25. Paragraph 4.2.1.1. (GTR) / 6.2.1.1(UNR)

Pr. High

“The Safety-relevant information and signals shall be:

- (a) Noticeable by the target user(s) under all operating conditions,
- (b) Comprehensible and unambiguous, and
- (c) Multi-modal (e.g., optical, auditory, haptic) if needed.”

Explanation of the requirement

This requirement is a general requirement and therefore applies to ADS features that permit a user to take over the performance of the DDT and to ADS features that do not permit a user to take over the performance of the DDT.

Safety-relevant information depends on the ADS feature, the current mode, current situation, and upcoming situation. Safety-relevant information and signals could include

- (1) ADS feature status (e.g., active, inactive, available),
- (2) current role (e.g. fallback user) and current responsibilities of the user or any possible changes in role,
- (3) stages of the deactivation process
- (4) vehicle and ADS faults and consequent adapted performance,
- (5) warnings on attempts to use the controls that are disabled, suppressed or by other means made unavailable,
- (6) information supporting the building up of situation awareness prior to and during a transition from ADS,
- (7) alerts to the user prior to and during the MRC process,
- (8) approaches to planned ODD exits (pre-alerts to system-initiated transitions) and the estimated time or distance remaining to such exit

Related to ‘clear’ the user’s language, knowledge of terminology and potential deficits in vision and hearing could be relevant considerations.

Example: A mode indication presented as a prominent visual change, designed to be readily detectable within the driver’s primary and peripheral field of view, may enhance noticeability and reduce the likelihood that a change in system state is missed. Conversely, a mode indication presented as a subtle change to an existing visual indicator (e.g., a tell-tale or other visual symbol) may be less noticeable and therefore overlooked.

If needed for multimodality means that the manufacturer should demonstrate that the selected modality schemes for safety-relevant information and signals are appropriate in each case.

Assessment of this provision could make reference to the manufacturer's process described in paragraph 7.1.6.2.(b)(viii).

26. Paragraph 4.2.2.1.1 (GTR) / 6.2.2.1.1. (UNR)

Pr. Medium

“The ADS feature shall be designed to prevent misuse and errors in operation by the user.”

Explanation of the requirement

This requirement is part of the requirements that relate to ADS features that permit a user to take over performance of the DDT.

The intention of this requirement is that any action performed by the user while the ADS is

performing the DDT should not lead to errors in vehicle operation or misuse of the ADS by the user. [This interpretation is in line with 5.3.2.10 (GTR) / 7.3.2.10 (UNR).]

An example of misuse of an ADSF-1 is not being awake while the ADS is performing the DDT.

An example of error in operation would be switching off the power train or to switching off the lights while the ADS performs the DDT in the dark.

An example of misuse of an ADS feature that does not permit a user to take over the performance of the DDT is a passenger accidentally acting on the controls provided for manual driving.

27. Paragraph 5.3.2.10 (a) (GTR) / 7.3.2.10 (a) (UNR) Pr. Undefined

“The safety concept shall describe measures or strategies, if any, implemented to:

- (a) Prevent or mitigate abuse, misuse, and errors by occupants that could affect safe performance of the DDT (e.g., occupants attempting to access driving controls)”

Explanation of the requirement

28. Paragraph 4.2.2.1.2 (GTR) / 6.2.2.1.2 (UNR) Pr. Medium

“While an ADS feature is active:

- (a) The controls related to manual performance of the DDT shall be disabled, suppressed, or by other means made unavailable in a manner that prevents unsafe interference with the ADS performance of the DDT....”

Explanation of the requirement

This requirement is part of the requirements that relate to ADS features that permit a user to take over performance of the DDT and when the ADS performs the DDT.

The controls related to manual performance of the DDT may include longitudinal and lateral vehicle controls, external lighting controls and audible warning device controls.

29. Paragraph 4.2.2.1.2 (GTR) / 6.2.2.1.2 (UNR) Pr. Low

“While an ADS feature is active:

- (b) Devices for indirect vision, tell tales, indicators, and non ADS related warnings may be disabled, suppressed, or, by other means, made unavailable, and”

30. Paragraph 4.2.2.3.11 (GTR) / 6.2.2.3.11 (UNR) Pr. Low

“During the deactivation procedure, controls related to manual performance of the DDT, direct view to the outside environment, devices for indirect vision, indicators, warnings, and tell tales shall be set to an appropriate state for manual driving.”

Explanation of the requirement

31. Paragraph 4.2.2.1.2 (a)(ii)(GTR) / 6.2.2.1.2 (a)(ii) (UNR) Pr. Medium

“When a user overcomes a suppression threshold, a user initiated deactivation procedure shall commence and must follow the requirements of [5.2.2.3.] Overcoming the suppression threshold shall not be the primary means to request a user initiated deactivation”

Explanation of the requirement

32. Paragraph XX (GTR) / XX(UNR) Pr. Undefined

Non ADS Related Warning

<"Clause Statement">

Explanation of the requirement

<Explanation Text>

33. Paragraph XX (GTR) / XX(UNR) Pr. Undefined

[A consistent assessment of suppression “strategies”.]

<"Clause Statement">

Explanation of the requirement

<Explanation Text>

34. Paragraph 4.2.2.1.3 (GTR) / 6.2.2.1.3 (UNR) Pr. Low

“The vehicle controls dedicated to the ADS shall be clearly identified and distinguishable to accommodate only the appropriate interactions”

Explanation of the requirement

This requirement is part of the requirements that relate to ADS features that permit a user to take over performance of the DDT.

The controls dedicated to the ADS (e.g. to enable the ADS or begin a user-initiated deactivation) can be distinguishable through size, form, location, colour, type, action type, spacing and/or control shape. The requirement aims to promote correct use and is not intended to prohibit multifunction controls.

35. Paragraph 4.2.2.1.4 (GTR) / 6.2.2.1.4 (UNR) Pr. Medium

“While an ADS feature is active, it shall inform the user of:

- (a) ADS status information,
- (b) The role of the fallback user in the case of a an ADSF-1, and
- (c) Adapted performance of the DDT consequent to some failure of the ADS.

Explanation of the requirement

This requirement is part of the requirements that relate to ADS features that permit a user to take over performance of the DDT and while the ADS performs the DDT.

(a) *ADS status information could cover:*

- which ADS feature is active and whether the ADS is operating as a specific ADSF-1 or ADSF-2 in the case of vehicles with a capability for both modes,
- the presence of faults leading to an imminent fallback response,
- the presence of faults leading to adapted performance of the DDT.

[In terms of 4.2.2.1.4.(b), the provision aims to promote reasonable information presentation strategies and fallback awareness, and is not intended to mandate continuous display of the information.]

While can be interpreted as continuous. If it is not a change is needed of the req. Revisit (b)

36. Paragraph 4.2.2.1.6 (GTR) / 6.2.2.1.6 (UNR) Pr. High

“While active, an ADSF 1 shall:

- (a) Continuously assess whether the fallback user is available to assume the role of driver. A fallback user is considered available when
 - (i) the user is at least awake, and
 - (ii) correctly seated in such a way as to enable the fallback user to take control of the DDT at the end of the deactivation procedure...”

Explanation of the requirement

37. **Paragraph 4.2.2.2.1. (GTR) / 6.2.2.2.1. (UNR)** *Pr. High*

“The ADS shall ensure a safe ADS feature activation.”

Explanation of the requirement

This requirement is part of the requirements that relate to ADS features that permit a user to take over performance of the DDT.

[There may be specific conditions to be considered for a safe feature activation. For example, that the ADS user may be required to wear a seatbelt when activating the feature. Considerations could also include whether it is safe to activate an ADS feature when the ADS can already assess that it will soon be leaving its ODD or whether it is safe to activate an ADS feature during specific driving situations (e.g., [when in a manoeuvre such as overtaking / when in a manoeuvre that would cause a collision risk])].

38. **Paragraph 4.2.2.2.3 (GTR) / 6.2.2.2.3 (UNR)** *Pr. High*

“The feature activation procedure (e.g., sequence of actions and states) shall take into account relevant recommendations or standards.”

Explanation of the requirement

This requirement is part of the requirements that relate to ADS features that permit a user to take over performance of the DDT.

Relevant standards could include *ISO/TR 21959-1, Road vehicles — Human performance and state in the context of automated driving: Part 1: Common underlying concepts*.

- ~~39. **Paragraph 4.2.2.3.1 (GTR) / 6.2.2.3.1 (UNR)** *Pr. Low*~~

~~The ADS shall follow a safe ADS feature deactivation procedure.~~

~~This requirement is supported by the following paragraphs.~~

40. **Paragraph 4.2.2.3.7 (GTR) / 6.2.2.3.7 (UNR)** *Pr. High*

“The deactivation procedure (e.g., sequence of actions and states) shall take into account relevant recommendations or standards”

Explanation of the requirement

This requirement is part of the requirements that relate to ADS features that permit a user to take over performance of the DDT.

Relevant standards could include *ISO/TR 21959-1 Road vehicles — Human performance and state in the context of automated driving: Part 1: Common underlying concepts*.

41. **Paragraph 4.2.2.3.5 (GTR) / 6.2.2.3.5 (UNR)** *Pr. High*

“ADS feature deactivation may be delayed if it is assessed by the ADS that the situation is unsuitable or unsafe for the subsequent mode of vehicle operation. In this case, the user shall be informed of this circumstance”

Explanation of the requirement

This requirement is part of the requirements that relate to ADS features that permit a user to take over performance of the DDT.

Situations in which a handover might currently be risky could include:

- Driving in a curve at speed with high lateral acceleration where the user might not be able to steer the vehicle safely;

While the ADS feature is executing a lane-change manoeuvre in circumstances where a sudden control action by the user could lead to a collision with a lead or following vehicle;

During an overtaking manoeuvre where a control action from the user could cause a collision with a vehicle being overtaken or a vehicle traveling in the opposite direction.

42. **Paragraph 4.2.2.3.8.1 (GTR) / 6.2.2.3.8.1 (UNR)** *Pr. Medium*

“A user is considered suitably engaged to resume the DDT when they are at least:

- (a) In contact with the steering control and,
- (b) Their gaze has been primarily directed to a driving task relevant area long enough to be able to resume the DDT safely.”

Explanation of the requirement

This requirement is part of the requirements that relate to ADS features that permit a user to take over performance of the DDT. This specific requirement applies to the feature deactivation procedure.

Regarding (a): Where manual steering control is by means of a steering wheel (a) refers to hand(s) on the steering wheel

Regarding (b): The emphasis is on “...to resume the DDT safely.” Depending on the type of ADS feature and the driving situation it could be suitable to ensure that the user has looked at several driving relevant areas or just to the most important one.

43. **Paragraph 4.2.6.1 (GTR) / 6.2.4.1. (UNR)** *Pr. Low*

“Means shall be provided that facilitates user understanding of the functionality and operation of the system”

Explanation of the requirement

This requirement is part of the requirements on information provision to users who can perform the role of the driver.

Different means may be available to the manufacturer to facilitate user understanding of the functionality and operation of the system such as documentation, website materials, etc., which may provide instructions, descriptions, explanations, expectations and overviews.

44. **Paragraph 4.3.4 (GTR) / 6.3.4. (UNR)** *Pr. Low*

“Other ADS requirements”

Explanation of the requirement

explain what is meant by “in alignment with engineering best practices