HF-group: <mark>Proposed</mark> detailed HF-related requirements

General Industry comments:
- The detailed requirements as presented in the [document] seem to be specific for certain vehicle applications (e.g. L3 or some L4) where the user-in-charge is requested/can take over some or all DDT.
- More thoughts are needed to address driverless shuttles provisions (i.e. no DDT related info)
- To ensure consistency with other workflows (i.e. DDT relevant topics 1à8), the detailed requirements proposed by CPs and Industry in [FRAV-16-11] should have been taken into account and filtered down to the essential when drafting this document

Industry input explanation:
- Crossed out wording is proposed for deletion,
- "Note" and "OICA CLEPA" relates to comments,
- Alternative wording proposals are highlighted in **BOLD**

	Performance Topic	Detailed Requirements	Measurable / Verifiable Criteria
		The ADS should interact safely with the user	

9	ADS (features) should be designed according to ~~Harmonized~~/Common HMI principles ~~to support the~~ <mark>mental model</mark>
	
	OICA CLEPA: Requirement for L3-L4 (non-driverless)
		• ~~The ADS (features) should use harmonized interfaces~~
		Note: Specific provisions required for harmonized or standardized HMI provisions – related to ensuring safety.
		• The design of the interaction **should help to avoid ADS mode confusion** ~~be harmonized~~:
		   o [use of common sequence of states in the transition/activation/overriding/…]
		• The interaction should be simplified:
		   o [Limit the number of roles]
		   o [Limit the number of potential transitions]
		
		OICA CLEPA:
		   • Requirements focus on driver to ADS interaction, rather than all ADS use cases.
		   • Requirements on harmonization/standardization should focus on safety	

		• Reference to Mental Model is not clear, clarification or definition is required.

10	The ADS should provide clear and unambiguous information to the user
	
	OICA CLEPA: TBC what "user" is intended – driverless vehicle passenger or user available to perform DDT?
		• The ADS should present information to the user on the current conditions:
		   o Status information
		   o ~~User Role~~
		     Note: user manual information; infotainment
		   o ~~Responsibility~~
		     Note: user manual information; infotainment
		   o ~~Permitted NDRA~~
		     Note: user manual information; infotainment
		   o ~~"Standard" information~~
		       • ~~Vehicle speed, range and Time~~2 to ~~Fuel~~
		   o ADS failure information
		   o Availability of automated features
		     Note: limited to L3; some L4; clarify is this address "standby" situation
		
		• The ADS should present information to the user on the upcoming conditions:
		Note: Such information is not a must to ADS passengers
		   o ODD boundaries
		     Note: user manual information; infotainment
		   o Potential roles to activate
		     Note: Optional, should not be included in the framework/regulation
		   o Oncoming decisions/maneuvers
		     Note: Optional, should not be included in the framework/regulation
		   o Estimated time to overtake in normal conditions
		     Note: Optional, should not be included in the framework/regulation
		   o ~~Warning for upcoming transition request~~
		   o ~~Confirmation request for upcoming transition~~
		   o Transition related communication
		     Note: Alternative proposal	

		• ~~The ADS should present the information so as to assure a safe interaction:~~ **Arbitration of messages should ensure priority for safety related content**
		    o ~~Timing requirements~~
		    o ~~Priority requirements~~
		    o ~~<mark>Saliency</mark> requirements~~
		
		OICA CLEPA: This high level requirement should focus on safe interaction only, as per topic.	

11	The ADS should prevent misuse and errors in operation	• The ADS should be designed to prevent inadvertent activation or deactivation • The ADS <mark>controls</mark> should be clearly distinguishable from other controls Note: Clarify what is intended by "controls". System failure, activation/deactivation – safety critical focus? • ~~The ADS should be designed to avoid activation of an ADS outside its ODD~~ Note: Covered by other sections. • ~~The ADS should be designed to avoid illegal settings~~ Note: Covered by other section – compliance with traffic laws. • The ADS should provide feedback when the user attempts to enable not allowed functions OICA CLEPA: Most of requirements related to functional/operational safety. Only HMI related requirements should be kept.	

12	The ADS should assure a safe ADS feature activation	• The ADS should inform the user that preconditions for activation are met • The activation should follow a common sequence o Common sequence to be in requirements • The ADS should provide confirmation that the system is activated OICA CLEPA: Detection of ODD and related ADS use is covered by first 8 topics. General comment: Proposal to consider establishing a single high level requirement related to ADS use and transitions, then cover items #12; #13; #14 within it. Consideration for requirement cascade should address level of automation, ADS application – fallback driver vs driverless (remote operator?).	
13	The ADS should assure a safe Transition Of Control	• The interaction should follow a common sequence in the transition of control (change of user roles) o Common sequence to be in requirements	

Figure 2 — System-initiated transition from automated to manual driving

[1]

- Transition of control should return to a common default user role (to prevent mode confusion)
  - This should normally be fully engaged driving (conventional driver)
- The ADS should verify that the user is available for the transition of control (MRM to be specified elsewhere)
- The ADS should verify that the driver is in stable control of the vehicle to complete the Transfer of Control to the user

OICA CLEPA: Current requirement does not cover well the driverless applications.

General comment: Proposal to consider establishing a single high level requirement related to ADS use and transitions, then cover items #12; #13; #14 within it. Consideration for requirement cascade should address level of automation, ADS application – fallback driver vs driverless (remote operator?).

14	The ADS should assure a safe user initiated take over	• The ADS should provide a clear feedback of the successful user initiated take over	

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[1] Reference: ISOxxx

		• The user initiated take over should return to a common default user role (to prevent mode confusion)
		    o This should normally be fully engaged driving (conventional driver)
		• The ADS should warn a user for an user initiated take over that will lead to an unsafe situation and prevent this <mark>(consider if a first attempt prevention is enough or the ADS has a better overview of complex traffic situations)</mark>
		Note: For non-driverless application (L3), the ability for overriding should always be possible.
		    o This should be in a requirement
		
		OICA CLEPA: Requirement is not considering driverless applications, remote operator transition of control related aspects.
		
		General comment: Proposal to consider establishing a single high level requirement related to ADS use and transitions, then cover items #12; #13; #14 within it. Consideration for requirement cascade should address level of automation, ADS application – fallback driver vs driverless (remote operator?).	

15 (new)	The OEM should provide tools for the user to learn about system functionality and operation.
	
	OICA CLEPA: This requirement is not related to ADS, but OEM/ADS manufacturer.
	Driver education should be covered elsewhere, not suitable for FRAV.
		On the general mental model (common understanding):
		• OEM should describe the possible educational approach:
		    o Theoretical and practical training
		    o How it aligns with common HMI and interaction
		• OEM should provide documented information on ADS (features) capabilities and limitations (the information should also refer to specific scenarios)
		• OEM should provide documented information on roles and responsibility of Driver/user and ADS when ADS (feature) is on/off
		• OEM should provide documented information on allowed transition of roles and procedure for the transition (activation/deactivation, ToC, Override)
		• OEM should provide a list of NDRA allowed when an ADS feature is active
		On the applied mental model (understanding the ADS-specifics)	

		• The ADS supports the user in correct operation (coaching) • The ADS gives prompt feedback on erroneous operation	
16	ADS vehicles that may operate without a **[user-in-charge/in-vehicle driver]** should provide means for occupant communication with **[a remote operator/user-in-charge/human driver/remote assistance personnel]**	This needs separate attention.	

SECOND PART: Detailed Requirements

	Performance Topic	Detailed Requirements	Measurable / Verifiable Criteria
	The ADS should interact safely with the user		
9	Activation of an ADS feature should only be possible when the conditions of its ODD have been met	- The ADS needs to inform the user of the (non-) availability of the ADS-features. -	
10	The user should be informed about the ADS status (when the ADS is activated) with regards to ODD		
11	The user should be permitted to take over control from the ADS, if the ADS is designed to request and enable intervention by a human driver		
12	The ADS should safely manage transitions of control to the user		
13	The ADS should safely respond to user input errors		
14	The ADS should provide feedback to the user on its operational status		
15	The ADS should warn the user of failures to fulfill user roles and responsibilities		
16	ADS vehicles that may operate without a **[user-in-charge/in-vehicle driver]** should provide means for occupant communication with **[a remote operator/user-in-charge/human driver/remote assistance personnel]**		