Information on some particular recent amendments to the DDAW System draft UN regulation to assist with understanding and acceptance

UN Regulation reference	Overview of key change	Justification summary
para 2.13.	new definition "system learning phase" AU proposed at IWG meeting 4 that new definitions would be needed/helpful. Agreed in meeting 5 that these would be proposed.	Allows proper **understanding of related requirements**. Definition based on context within technical requirements, discussions within IWG, information from EC FAQ document, and general understanding of vehicle electrical system processes.
para 5.3.8. - 5.3.8.1.	amendments to make use of new definition above	as above
para 2.14.	new definition "system start-up phase" AU proposed at IWG meeting 4 that new definitions would be needed/helpful. Agreed in meeting 5 that these would be proposed.	Allows proper **understanding of related requirements**. Definition based on context within technical requirements, discussions within IWG, information from EC FAQ document, and general understanding of vehicle electrical system processes.
para 5.3.7.	amendments to make use of new definition above	as above
para 5.7.2.1.	para resides within a sub-section 'Temporary failures' as proposed by AU in IWG meeting 4 and discussed in meeting 5, for ease of understanding and closer alignment to later structure of ADDW system regulation. **Core requirements have not changed.**	EU reg requirement that needed improved wording: "*Temporary visual failure warning signal can be used as complimentary information to the constant optical failure warning signal*". The original para is not sufficiently clear, hence replacement adapted from the ADDW regulation clarifies that the same visual failure warning signal (as for permanent) may be displayed for temporary failure conditions, and removes confusing reference to "constant optical failure warning" (**not mentioned anywhere else in reg**) and the temporary failure warning being complimentary {complementary} to the constant failure signal, which **doesn't explain under what circumstances it would show (failure conditions etc) or how it would show etc**. Have now adapted the EU reg wording into para 5.7.2.1. to account for approved system designs that may have been influenced by that wording, however integrated that wording into this less confusing structure that also closely aligns with the ADDW reg requirements.

UN Regulation reference	Overview of key change	Justification summary
Annex 4 - Appendix 1		
para 6.1.4.2.	new para in 'Application of the KSS' to account for recording of false positive events.	False positives are mentioned in para 9 'Acceptance criteria' as one of the four possible events, as well as in Introduction and para 5.2.2. of the regulation, but there are **no existing para in the testing appendix to explain under what conditions a FP will be recorded, and what to do following a FP. Also needed to properly populate the reference table for DDAW system warning classifications.** **note: FP do not influence 'acceptance criteria' (sensitivity)**
para 6.1.4.3.	new para in 'Application of the KSS' to account for recording of true negative events. For KSS ratings at 6 or less, as the inverse logic to para 6.1.4. for both warning status and ratings.	True negatives are mentioned in para 9 'Acceptance criteria' as one of the four possible events, but the existing para in the testing appendix only covered the case of a true negative outlier. Therefore **it was not explained under what conditions otherwise (of which many apply) a TN will be recorded, and what to do following a TN. Also needed to properly populate the reference table for DDAW system warning classifications.** **note: TN do not influence 'acceptance criteria' (sensitivity)**
para 6.1.4.4.	new para in 'Application of the KSS' to account for recording of true negative events. For where one or both KSS ratings may be as high as 7.	As above, except this special case needs to be highlighted to explain and clarify that a KSS level of 7 is unique in that it may result in either a stable true negative (not subject to additional testing to avoid FN) where no warning is given, or a true positive where a warning is given. **Needed to properly populate the reference table for DDAW system warning classifications.** **note: TN do not influence 'acceptance criteria' (sensitivity)**
para 6.1.4.5.	new para in 'Application of the KSS'.	Gateway to the main section in the testing appendix (para 6.1.7.) where classification of warnings are clarified for situations involving two testing intervals and dynamic rating levels. **Important to clarify here that TN may result from conditions other than those set above.**

UN Regulation reference	Overview of key change	Justification summary
para 6.1.5.	new para in 'Application of the KSS' to clarify false negative events.	Proposed at IWG meeting 4, and **deemed necessary as otherwise the regulation does not set what is to occur once a FN has been recorded,** as adapted from the EC FAQ. **aligns with information within FAQ**
para 6.1.5.1.	new para in 'Application of the KSS' to clarify false negative events.	Proposed at IWG meeting 4, and **deemed necessary to state in general terms the preconditions for a FN to be recorded, including as a pre-cursor to the new sub-para 6.1.5.1.1. & 6.1.5.1.2. that set established requirements otherwise not prescribed within the text of the regulation.** **aligns with existing regulation and FAQ**
para 6.1.5.1.1.	new para in 'Application of the KSS' to clarify false negative events.	Proposed at IWG meeting 4, and **deemed necessary to state the limit on number of FN events to be recorded, which have been determined as established requirements otherwise not prescribed within the text of the regulation, but contained within the EC FAQ.** **aligns with information within FAQ**
para 6.1.5.1.2.	new para in 'Application of the KSS' to clarify false negative events.	Proposed at IWG meeting 4, and **deemed necessary to state the preconditions for an additional FN to be recorded, which have been determined as established requirements otherwise not prescribed within the text of the regulation, but contained within the EC FAQ.** **aligns with information within FAQ**
para 6.1.6.	new para in 'Application of the KSS' to clarify true positive events relative to the optional (KSS = 7) drowsiness threshold.	Proposed at IWG meeting 4, and included for completeness relative to the detailed cases included in 6.1.7. for below 8 to >=8, as this para is for below 8 to 7 as the only other scenario **specifically important with respect to drowsiness 'thresholds' of 7 (optional) and 8 (mandatory), and also sets up the two interval analysis in advance of it being used by para 6.1.7. to aid understanding**. Note para 6.1.4.4. covers the case of no warning in the first test interval, as well as the second interval where para 6.1.7. does not apply. **aligns with existing regulation**

UN Regulation reference	Overview of key change	Justification summary
para 6.1.7.	adaption of existing para 5.1.5. in EU reg	Based on EU regulation para with **minor change to have a consistent flow of example ratings through each subsection for ease of understanding, and also have three examples in each**. **aligns with existing regulation**
para 6.1.7.1.	adaption of existing para 5.1.5. (a) in EU reg, whereby it is clarified that the warning status of the DDAW system being referred to is that within the first time interval	Original text stated "the DDAW system provides a warning and it shall be treated as a true positive and end the specific test…". It was then **relied upon to include by default true positive events in a second testing interval** (if a warning is given in that period), however **the second testing interval was not introduced until after this para**, and subsequent possibilities to record true positive events **were then not covered for each scenario in the second interval**. **aligns with existing regulation**
para 6.1.7.2.		
a)	adaption of existing para 5.1.5. (b) in EU reg, whereby the case for no system warning and end to testing is separated from the other cases combined into the same paragraph	This specific case for FN needed separation and clarification, as well as a dedicated para for **explaining alternate outcomes within Table 1 as indicated by footnotes [a] and [b]**. **aligns with existing regulation**
b)	adaption of existing para 5.1.5. (b) in EU reg, whereby the case for no system warning in the first interval and continued testing is accounted for and then separated from the other cases combined into the same paragraph to specify all outcomes for the particular ratings sequence	Firstly, the existing reg **does not clarify the recording of a TN event** for sub-case described. Secondly, the revised paragraph structure **sets ratings sequence upfront for ease of understanding sub-para**, which then provide **specific references as required for population of Table 1**. **aligns with intent of existing regulation as evidenced by the excel warning classification table appended to EC FAQ**
i	adaption of existing para 5.1.5. (b) first '-' point in EU reg, whereby the case for no system warning in the first interval, continued testing, and no system warning in the second interval for the specific ratings sequence is separated here	The existing reg **does not clarify that the recording of the FN event** occurs after a second instance of the system not providing a warning within a testing interval. The revised paragraph structure provides a **specific reference as required for population of Table 1**. **aligns with the outcome via the existing regulation as evidenced by the excel warning classification table appended to EC FAQ**

UN Regulation reference	Overview of key change	Justification summary
ii	amendment to existing para 5.1.5. (b) first '-' point in EU reg, which does not currently account for the case where a system warning is given in the second interval for the specific ratings sequence	The existing reg **does not clarify the recording of the TP event where the system provides a warning in the second testing interval**. The revised paragraph structure provides a **specific reference as required for population of Table 1**. **aligns with the existing regulation as evidenced by the excel warning classification table appended to EC FAQ, while providing clarity**
para 6.1.7.3.	adaption to existing para 5.1.5. (b) second '-' point in EU reg, whereby the case for no system warning in the first interval and continued testing is accounted for and then separated from the other cases combined into the same paragraph to specify all outcomes for the particular ratings sequence	Firstly, the existing reg **does not clarify the recording of a TN event** for sub-case described. Secondly, the revised paragraph structure **sets ratings sequence upfront for ease of understanding sub-para**, which then provide **specific references as required for population of Table 1**. **aligns with intent of existing regulation as evidenced by the excel warning classification table appended to EC FAQ**
a)	adaption of existing para 5.1.5. (b) second '-' point in EU reg, whereby the case for no system warning in the first interval, continued testing, and no system warning in the second interval for the specific ratings sequence is separated here	The existing reg **does not clarify that the recording of the FN event** occurs after a second instance of the system not providing a warning within a testing interval. The revised paragraph structure provides a **specific reference as required for population of Table 1**. **aligns with the outcome via the existing regulation as evidenced by the excel warning classification table appended to EC FAQ**
b)	amendment to existing para 5.1.5. (b) second '-' point in EU reg, which does not currently account for the case where a system warning is given in the second interval for the specific ratings sequence	The existing reg **does not clarify the recording of the TP event where the system provides a warning in the second testing interval**. The revised paragraph structure provides a **specific reference as required for population of Table 1**. **aligns with the existing regulation as evidenced by the excel warning classification table appended to EC FAQ, while providing clarity**

UN Regulation reference	Overview of key change	Justification summary
para 6.1.7.4.	adaption to existing para 5.1.5. (b) third '-' point in EU reg, whereby the case for no system warning in the first interval and continued testing is accounted for and then separated from the other cases combined into the same paragraph to specify all outcomes for the particular ratings sequence	Firstly, the existing reg **does not clarify the recording of a TN event** for sub-case described. Secondly, the revised paragraph structure **sets ratings sequence upfront for ease of understanding sub-para**, which then provide **specific references as required for population of Table 1**. **aligns with intent of existing regulation as evidenced by the excel warning classification table appended to EC FAQ**
a)	adaption of existing para 5.1.5. (b) third '-' point in EU reg, whereby the case for no system warning in the first interval, continued testing, and no system warning in the second interval for the specific ratings sequence is separated here	The existing reg **does not clarify that the recording of the FN event** occurs after a second instance of the system not providing a warning within a testing interval. The revised paragraph structure provides a **specific reference as required for population of Table 1**. **aligns with the outcome via the existing regulation as evidenced by the excel warning classification table appended to EC FAQ**
b)	amendment to existing para 5.1.5. (b) third '-' point in EU reg, which does not currently account for the case where a system warning is given in the second interval for the specific ratings sequence	The existing reg **does not clarify the recording of the TP event where the system provides a warning in the second testing interval**. The revised paragraph structure provides a **specific reference as required for population of Table 1**. **aligns with the existing regulation as evidenced by the excel warning classification table appended to EC FAQ, while providing clarity**
Table 1	Updates to Table format in comparison to Excel s/s, including for improved readability, but also for clarity and traceability / linkage to requirements in the text of the regulation. Also more complete information is given, such as classifications that are subject to continued testing, and the use of the table for testing beyond the initial Tn+2 where valid. The details of paragraph amendments 6.1.4. - 6.1.7. listed above relate.	In the “DDAW warning classification table” (EC FAQ): - 33/108 sub-cases with no classification (NA instead of TN, FP, and some potential exclude, outlier, FN?) - 54 sub-cases missing references to regulation - some sub-cases have issues with given references to regulation - missing explanation of symbols / terms used
Test cases 1 - 18	see above	**Alignment on TP and FN**, but more robustly and clearly accounts for different testing scenarios and continuation of testing, while also providing direct references to the regulation for clarity and rigour. Also TN and FP are properly populated, as although not used for sensitivity calculation, it is important to account for all testing outcomes and classifications listed in the regulation.

UN Regulation reference	Overview of key change	Justification summary
Test cases 19 - 27	Area of concern as listed to the right. Information from industry to allow understanding of Excel s/s in this area is needed to better deal with classifications. I have however also suggested a potential solution that would properly integrate with the other clarifications in the Appendix, while likely having low probability of any practical impact on existing results from testing, including due to the low likelihood that consecutive KSS ratings could be e.g. 4-8 or 5-8.	These classifications are unable to be properly aligned to existing requirements, as **rating sequences starting at KSS >=8 are not explicitly covered. Also important here is the definition for Tn used for Table 1, which implies that where a sequence starts at KSS >=8 as a first value for Tn, the prior rating was not higher than KSS = 5.** This may allow us to for example add a paragraph that effectively means the time interval between e.g. KSS = 5 and KSS >=8 at Tn is ignored, and the first KSS >=8 treated as a KSS = 7 due to the magnitude of the change being unconventional (e.g. 5-8). Therefore the FN? currently shown in the first time interval for the test cases 25, 26, 27 would become TN[a], and other classifications as indicated, with some updated paragraph references. This **would only leave one case with a change** that has the potential to impact on sensitivity, which is case 27 in the second time interval and where a warning is not given. **If the data is valid to record TP where warning is given, why is it not valid to classify for cases of no warning as per previous cases? This would surely include a FN for case 27 after two test intervals where no warning has been given at KSS >=8?**
Table 1 explanatory notes	Notes provided as listed below - these are not provided in the existing Excel table.	The table cannot be interpreted properly without the explanatory notes including the meaning of labels / symbols.
Tn	Tn is the point in time at the end of the testing interval for which the participant first provides a KSS rating of level 6 or above (refer to paragraph 6.1.2.1.). It is assumed that no warnings from the DDAW system have been given prior to Tn.	Critical first requirement in being able to interprete the table and to relate testing data to the requirements of the regulation. It can also be conveniently linked to an existing requirement as per para 6.1.2.1. listed.
Tn+1	Tn+1 is the point in time at the end of the testing interval immediately following Tn.	See Tn; Tn+1 flows from this.
Tn+2	Tn+2 is the point in time at the end of the testing interval immediately following Tn+1.	see above
[a]	On the basis that the testing continues for an extra testing interval, otherwise the classification is false negative (FN).	Without this footnote and its application in Table 1, the information provided is **not strictly correct relative to the requirements of the regulation and therefore misleading. The current Excel s/s does not have this clarification**.
[b]	On the basis that the testing continues for an extra testing interval and Tn+1 becomes Tn, Tn+2 becomes Tn+1, and new data is assigned to Tn+2, otherwise the classification is false negative (FN).	Without this footnote and its application in Table 1, the information provided is **not strictly correct relative to the requirements of the regulation and therefore misleading. Also, the way to use the table under such conditions where testing continues is not clear. The current Excel s/s does not have this clarification**.

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c	For a situation where Tn+1 is considered as Tn, and Tn+2 is considered as Tn+1, because both Tn and Tn+1 have a rating <=7 and so testing continued.	Footnote provides additional information for **completeness and to aid in understanding the regulation and how to use the Table 1 with test data. The current Excel s/s does not have this clarification.**
*	TP, FN, FP and TN events are also described at para 9.1. of this Appendix.	Important clarification on the abbreviated warning classifications. **The current Excel s/s does not have this clarification and link to the regulation requirements.**
**	Where testing is valid to continue after Tn+2, data for Tn can be disregarded so Tn+1 becomes Tn, Tn+2 becomes Tn+1, with new data assigned to Tn+2.	Important explanation on the general use of the spreadsheet with test data, as well as linking with the updated regulation requirements that specifically state where testing may continue. **The current Excel s/s does not have this clarification and link to the regulation requirements.**
6.2.3.1.1	restructure for improved clarity and flow, including example rating sequences to help understanding of FN classifications where the testing time interval is < 5 mins.	see left
6.2.3.1.2	restructure for improved clarity and flow	see left
note after para 6.2.3.1.2	Note to highlight possible gap in existing requirements as follows: *Should this section confirm true positive events, false positives events, and true negative events as are covered in para 6.1. for completeness, otherwise what does a manufacturer assume are the applicable conditions/criteria where para 6.1.7 does not apply? Also noting that in para 6.1., false positives and true negatives generally are covered in para 6.1.4, i.e. outside of para 6.1.7.*	Concern over possible need to cover further **gaps in EU regulation for testing using Alternative Measurements with test time intervals less than 5 minutes**. **Perhaps either Alternative Measurements that rely on Annex I Part 2 para 5.2.3. of the EU regulation for time intervals less than 5 mins have generally not been used to date and/or requirements have been clarified through discussions with the Technical Service and Type Approval Authority?**
9.1.		
first para	non-simulated environment, rather than simulated environment	9.1 (d) modification constants apply for **open road testing**.
next after para (d)	>35% rather than >=35%, >45% rather than >=45%	Average sensitivity is required to be **greater than** X%, not greater than or equal to X%.