Submitted by the EVE Secretariat

Informal Document EVE-46-14e\_DRAFT

Report of the 46th Session

Electric Vehicles and the Environment Informal Working Group

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| Location: | WebEx |
| Date and Time: | April 23, 2021 at 05:30 – 08:00 EST April 26, 2021 at 05:30 -08:00 EST  |
| Chair: | Mr. Michael Olechiw (USA) [Present] |
| Vice-Chair(s): | Mr. Hajime Ishii (Japan) [Present]Ms. Chen Chunmei (China) [Not Present] |
| Secretary:  | Ms. Kendelle Anstey (Canada) [Present] |
| Drafting Coordinator(s):  | Ms. Panagiota Dilara (European Commission) [Present] |

Agenda Items

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# List of Abbreviations

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| CoP | Conformity of Production |
| DPR | Declared performance requirement |
| EC | European Commission |
| EVE IWG | Electric Vehicles and the Environment Informal Working Group |
| ISC | In-service conformity |
| MPR | Minimum performance requirement |
| SOC | State of charge |
| SOCE | State of Certified Energy |
| SOH | State of Health (previous term SOH used, but now refers to both SOCE and SOCR) |
| SOCR | State of Certified Range |
| U.S. EPA | United States Environmental Protection Agency |
| SAE | Society of automotive engineering |

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|  | **Agenda Item** | **Time Allocation** |
| 1 | Introductions, review of meeting agenda | 05:30 – 05:35  |
|  | No concerns expressed on meeting agenda. Meeting agenda accepted. |
| 2 | Discussion of GTR open issues and GTR text comments – Japan documents | 05:35 – 07:00 |
|  | * Japan provided a proposal on how to define the certified UBE (document EVE-46-03e). The proposal included the following recommendations.
	+ One UBE value per interpolation family
	+ UBE to be used as measured or certified value and not declared by OEM
	+ Select UBE via maximum or worst case durability requirement with rounding to the nearest whole number.
	+ Example shown on slide 2.
* U.S. EPA expressed concern on compliance provision if the UBE is rounded to a whole number
* EVE IWG overall goal is to adopt a strategy that will work for WLTP and other certification approval processes
* OICA expressed concerns on UBE, presented later in the meeting
	+ OICA is also considering the impact of additional test groups in North America
* Japan presented document EVE-46-04e for correction methods of UBE certified for OVC-HEV
	+ Four methods are considered; no correction; deriving the correction factor via interpolation family; correction by SOC profile; or correction by ΔEREESS profile.
	+ Japan compared the practicability of each option and proposes correction by SOC profile.
	+ Japan notes that if there is no correction, there is some error, but the correction can be synced with 1.1-1.3% margin.
	+ One open issues to consider is if there are already corrections in place in North American regulations (under SAE)
* Japan presented document EVE-46-06e which describes current GTR open issues and Japans views.
	+ Japan added text suggestions for section 6.2 for EVE IWG to consider the text.
	+ One concern of note was that Japan does not see necessity in rounding for the UBE measure for part A and B since the calculation process takes it into account.
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| 3 | **OICA EVE-46-09e** | 07:10 – 08:00 |
|  | * OICA provided document EVE-46-09e which analyzed proposed statistical methods for Part A using the Monte Carlo simulation method, and a normal distribution to fit the behavior of the methods.
	+ Option A:
		- A1:Use of decisions chart for the statistical procedure (following ISC procedure)
		- A2:Use of table from UN Regulation No. 83 (following CoP procedure)
	+ Option B:calculated normalized values
	+ OICA noted that option B is very sensitive to range estimate. If it is slightly overestimated the test will fail. The ratio needs to be below one to have a high pass rate.
		- With this in mind, OICA considers Option A1 and A2 to behave more logically, even if Option B has a similar distribution.
* Japan noted that the difference between the A and B options is the % criteria between the measured and read SOCE.
* EC recommended to adjust the parameters and to repeat the methods. Japan agrees.
* OICA commented that if unable to change parameters for option B by June then Option A should be chosen.
* OICA considers option B unfeasible for evaluating standard deviation (see slides in document EVE-46-09e)
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Day 2

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|  | **Agenda Item** | **Time Allocation** |
| 4 | **U.S. EPA presentation on part b families on battery durability** | 05:35– 06:00 |
|  | U.S. EPA presented document EVE-46-12e. Main ideas and proposals expressed were the following:* Recommendation of a functional analysis of part B family criteria that relates to vehicle design features to battery durability.
* Suggested formation of a technical subgroup to identify and capture all relevant durability factors.
* Examples provided of battery durability aspects that could be considered for Part B families.
* Recommendation was made by the U.S. EPA to consider a virtual mileage to consider the factors that may lead to battery degradation that the odometer doesn’t already take into account. Such examples:
	+ Storage over battery calendar life
	+ V2G and V2home charging
* U.S. EPA also recommended to consider a variation allowance for part b families.
* Consideration of battery swapping was also mentioned as a point of consideration.

EVE IWG feedback* OICA – does not want a significant number of vehicles excluded from the monitors. OICA will have a discussion on virtual mileage to cover extended usage.
* Not many positions on battery swapping from EVE IWG members, but many could see it as an issue.
* EC in agreement that V2G is considered normal usage.
* OICA – on idea of equivalent mileage could also include autonomous driving impacts.
* AVERE interested to take part in any sub group or break out group interested in tackling this issue.
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| 5 | **Discussion of GTR open issues and GTR text comments** | 06:00 – 07:00 |
|  | EVE IWG discussed that SOCE and SOCR evaluation criteria should be exclusively listed and well defined so that OEMs know what exactly to evaluate. * Monitor flag on Part A and B no agreement reached yet between EVE IWG members
	+ Norway – suggest put flag on display for owner and second hand buyer then incentive to exclude it from OEM is reduced.
	+ OICA suggest remove flag from the procedure and then if the monitor begins to indicate performance below the MPR or warranty activities then can take more action in phase 2.
	+ U.S. EPA and EC agree that Part A which reflects physical testing of vehicles, and Part B which reflects the average of fleet monitors are two separate open issues.
	+ There are disagreements between members on the outcome of instructions if a monitor is flagged
	+ EC suggested to remove flag from Part A samples and open more possibilities for Part B.
	+ OICA to discuss internally and bring the discussion to the next meeting.
* Break out group suggested on open issue for Annex 2, case B
	+ U.S. EPA proposing to add a blanket allowance (e.g. 5 -10%) to exclude vehicles that may not be considered within the normal usage to capture 90th percentile.
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| 6 | **After break GTR discussions, action items, conclusions** | 07:10-08:00 |
|  | Actions, outcomes, remaining open issues* OICA to consider the statistical methods for the next EVE IWG discussion.
* Break out group suggested on Annex 3 of the GTR, statistical method Part A for option B, and also on family definitions.
* Break out group to identify and capture all relevant durability factors to Part B families.
* U.S. EPA to follow up on methods for checking software versions
* UNECE secretariat to also follow up on application of software versions in the context of GTR in WP. 29

Open issues, GTR additions* Added placement of battery in vehicle in section 6.1.2.
* EVE IWG to improve GTR text regarding chargers in section 6.1.2 on the Part B family groups (e.g. dc charging capability).
* Rounding issue remains an open issue to be confirmed by the EVE IWG
* Mention of VG2 grid added in GTR
* Sentence 6.4.1 modified to on minimum threshold for statistical approach.
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