Submitted by the EVE Secretariat

Informal Document EVE-71-06e
71st EVE IWG session: May 28-29, 2024

Report of the 71st session
Electric Vehicles and the Environment Informal Working Group (EVE IWG)

Location:	Virtual – Webex
Date:	May 28 – 29, 2024
Time:	05:30 – 08:00 EDT
Chairs:	Mr. Michael Olechiw (United States of America) Ms. Elena Paffumi (European Commission)
Vice-Chairs:	Ms. Chen Chunmei (China) Mr. Nobunori Okui (Japan)
Secretariat:	Mr. Leeson Guay (Canada)

Day 1 – May 28, 2024, 05:30 EDT

1. Introduction, review of agenda, and meeting recap

   Documentation

   - EVE-71-01e

   Context

   The EVE IWG co-chairs addressed members and welcomed everyone to the virtual meeting.

   The co-chairs presented the meeting agenda to EVE IWG members, which can be seen below. The agenda was reviewed and adopted by the EVE IWG prior to beginning discussions.

   Day 1 – May 28, 2024, 05:30 EDT

   - Introduction, review of agenda, meeting recap
   - Details on system bench demonstration
   - HDV GTR – Comments on open items
   - HDV GTR – Alternative method phase 1 retention
   - HDV GTR – Review of open and agreed items
   - HDV GTR – Test procedure steps and boundary conditions

   Day 2 – May 29, 2024, 05:30 EDT

- Introduction, review of agenda
- Details on system bench demonstration
- HDV GTR – Test procedure steps and boundary conditions
- HDV GTR - Proposal on the use and verification of UBC
- Closing remarks

The EVE IWG secretary briefly reviewed the *Report of the 70th EVE IWG session*, highlighting action items and key decisions from the discussions, held virtually, on May 07-08, 2024.

Discussion

Action Items

Decisions

2. Details on system bench demonstration

Documentation

Context

The Japanese delegation provided further information about the system bench test demonstration, which will be conducted on September 17, 2024, at the Honda Research and Development Centre. Japan communicated that participants are to arrive at Utsunomiya Station at 12:00 prior to the lab tour, which will begin at 14:00 local time.

Contracting party participation is limited for safety reasons. Japan would first like member states to reserve a spot, to get an initial participation estimate, requesting that contracting parties only having one delegated participant.

Discussion

The co-chairs indicated that these conditions are understandable and that there will likely be a lot of participation interest.

The Organisation Internationale des Constructeurs d'Automobiles (OICA) asked when the deadline for expressing interest in the demonstration would be. The Japanese delegation confirmed that the end of July would be ideal for them.

The co-chairs suggested that on the second day of the 71st EVE IWG session, perhaps member states could express their interest directly to Japan.

Action items

- The secretariat to modify the agenda to allow for a quick poll of interested participants in the system bench testing demonstration on September 17, 2024.

Decisions

3. HDV GTR – Comments on open items

Documentation

- EVE-71-04e

Context

OICA presented their position and comments regarding the outstanding topics of the electrified heavy-duty vehicle (eHDV) global technical regulation (GTR) draft text, including:

- Measurement tolerances,
- Family concept, and
- Pilot phase testing details.

Discussion

The American delegation stated that they are interested in participating in the pilot phase testing and will be in Europe at the end of June so perhaps the testing will line up with this timing. The European Commission (EC) also expressed that they are interested in participating in the pilot phase testing. OICA requested that interested contracting parties please indicate to Axel your interest by May 31, 2024.

The drafting coordinator indicated that the addition of comments, received to date, to the eHDV GTR draft text is almost complete and that the comments received today as part of the presentation will also be added, including the family definitions.

The American delegation requested clarification on the analysis conducted to arrive at the proposal of frequencies, were these specifications listed by the manufacturer of the equipment. The drafting coordinator added that the values of frequency and accuracy come from United Nations (UN GTR No. 15 in addition to market research at the time. OICA expressed that they feel their proposal on the frequency and accuracies is rather simplistic, but they can confirm with suppliers to ensure reading accuracies are within the limits of the devices. The Japanese delegation highlighted that based on the new OICA proposals, it appears that the EVE IWG will not have time to finish a draft version of the regulation by July 22, 2024. Japan explained that they had previously submitted proposals for these accuracies at the 68th EVE IWG session.

The Japanese delegation requested clarification on the family concept comments with regard to part a), b), and g). OICA clarified that they are looking for further clarification and revision of c) and f) of the Part A families and elimination of d) and e), while a), b) and g) are okay at this time. The Japanese delegation recalled that these had already been agreed and developed for the light-duty vehicle (LDV) GTR so if there are any issues and unique circumstances for eHDV then it would warrant a modification. The charging power associated with e) will lead to battery deterioration so it seems like it would be needed. The drafting coordinator mentioned that the charging power was discussed at the last EVE IWG session, and it was agreed to eliminate it from Part A but include it in Part B. The drafting coordinator also suggested eliminating d) from the Part A family and having it elsewhere as a general requirement. The modifications to f) were made due to concern with having too many vehicles to test within a family. The drafting coordinator suggested that the discussion on family concepts could be arranged as a standalone topic for a future meeting. There is also a

statement at the bottom of the Part A and Part B family definitions that offers additional flexibilities to the manufacturers. OICA commented that there have been plenty of LDV products on the market and their families are easier to define but for eHDV the vehicles are prototypes and are just starting to be introduced. For the eHDV sector we are looking to regulate products that are not yet on the market and a separate discussion on the family definitions seems to make sense.

The Japanese delegation expressed that each time there is a meeting there appears to be a growing list of open items. Is there a need for an accuracy modification to the voltage because if we are having accuracy issues perhaps, we should just eliminate method 1 testing and stick to method 2 and the chassis dynamometer. The American delegation supported, stating that in the United States (U.S.) there is a self-certification processes and we do not have any restrictions on where the testing is done so method 2 and chassis dynamometer testing would be a possibility. In terms of accuracy of the voltage measurement data, we would like to see the specification sheets for the equipment because it is not clear why there would be limitations on accuracy. The drafting coordinator added that in UN GTR No. 15, there is no voltage measurement accuracy, but in UN GTR No. 21 there is voltage and current accuracies, so it will need to be verified. From initial testing, it appears that there is minimal to no voltage fluctuation and so the accuracy is likely not critical. OICA stated that unfortunately they cannot accept a procedure that requires the shipment of vehicles around the world. During the pilot phase we will do the testing at our facilities and have side discussions as needed. The LDV and eHDV world are very different as eHDV does component level and on-road testing whereas LDV relies on dynamometers.

Action items

- Contracting parties to inform OICA of interest in participating in the pilot phase testing of the eHDV GTR test procedures by May 31, 2024.

Decisions

4. HDV GTR – Alternative method phase 1 retention

Documentation

- EVE-71-03e

Context

The Chinese delegation offered a presentation outlining the need and reasoning behind the inclusion of an alternative chassis dynamometer testing method within the submission of the eHDV GTR phase 1 text.

Discussion

The co-chairs asked whether the current draft text reflects the alternative method. The drafting coordinator confirmed that the eHDV GTR draft test does include the alternative method text but what has been added has not been thoroughly verified. The co-chairs stated that they feel the presentation was offered to reinforce the idea of having chassis dynamometer testing as an alternative method in the first phase of the eHDV GTR. I think in general everyone agrees that

chassis testing offers the most repeatable results; however, we are struggling with the availability of them and the propensity toward them. Currently heavy-duty certification is at the component level and the required chassis dynamometer testing would be a deviation from the main heavy-duty approach. China expressed that they see the general concerns, but the alternative method should be included because although it is only in China now, it is reasonable and aligns with UN GTR No. 22 methods. If other countries want to see test results, they can test using this alternative method. The drafting coordinator communicated that perhaps this needs to be revisited and decided whether it is left as an alternative method with an equivalency approach or make it a third method as an option. Perhaps China can offer more data in the meantime.

The EC asked whether the inclusion of the chassis dynamometer alternative test method in the eHDV GTR would result in China mandating it as a testing requirement in China, as this could be a serious issue for non-domestic manufacturer competition. The Chinese delegation stated that if manufacturers want to come to the Chinese market, they should respect the Chinese requirements. China is not trying to mandate this test method in the eHDV GTR and we intend the manufacturers to be able to choose freely which method they want to use. The drafting coordinator repeated the question, will China enforce only the alternative chassis dynamometer method for useable battery energy (UBE) testing. China responded that they have previously used on-road testing and have moved to chassis dynamometer testing because the on-road testing was not accurate enough. Currently, the only method in China is chassis dynamometer testing but they would consider adding other methods upon further study. The Japanese delegation indicated they are supportive of the inclusion of chassis dynamometer testing in first phase of the eHDV GTR and that under the UN GTR, they feel that chassis dynamometer testing should be method 3 instead of an alternative. The EC explained that they understand where China and Japan are coming from, but we had agreed to have it as an alternative method which will require verification before introducing it into the first phase of the eHDV GTR. Ultimately, we need more test results and we would like Japan and China to present more data and testing. Given the current timelines the inclusion is likely not possible for the first phase of the eHDV GTR but if there is time and sufficient data to support, then it can certainly be taken onboard. The secretariat of the Working Party on Pollution and Energy (GRPE) stated that as a group we are striving for the global harmonization of regulations, and we should be discussing limitations of the different regions. The idea would be for each party to discuss and be willing to incorporate the methods proposed. The Japanese delegation expressed surprise in the comments from the EC since the Japanese delegation has already conducted testing and given supporting data. In the opinion of the Japanese delegation, all the other test methods should be made equivalent to a chassis dynamometer baseline. Therefore, Japan is of the opinion that equivalent data should be given for the other proposed test methods and not the chassis dynamometer. The American delegation stated that they feel it makes sense to take the text of the chassis dynamometer proposal and compare it against what is currently existing in the regions for chassis dynamometer requirements. Overall, we agree with Japan that chassis dynamometer testing is the baseline and the only reasons we are concerned with the procedure is because of a lack of availability of these dynamometers. There are reasons why we have excluded it, but it is not because of its accuracy or repeatability.

<u>Action items</u>

- Contracting parties to evaluate the proposed chassis dynamometer alternative method against regional text and requirements.

Decisions

5. HDV GTR – Review of open and agreed items

Documentation

- EVE-71-02e

Context

The drafting coordinator presented a document outlining the decisions made from the previous EVE IWG session in addition to further information and updates regarding various outstanding items in the electrified heavy-duty vehicle (eHDV) global technical regulation (GTR) draft text.

Discussion

Action items

Decisions

6. HDV GTR – Test procedure steps and boundary conditions

Documentation

- EVE-71-02e
- EVE-71-05e

Context

This item was set with the objective of discussing and resolving outstanding topics of the eHDV GTR draft text.

Discussion

Temperature

OICA suggested that before settling on a final decision with temperature, this should be left open until the pilot phase testing has been completed, as it will show clearly what is possible and what is not. The Japanese delegation stated that the testing is being done in July so there will likely not be any issues. The drafting coordinator stated that unless otherwise indicated by the pilot phase testing, the temperature requirements for preconditioning, soak and charge alongside prewarming considerations will be as outlined in the EVE-71-02e document.

Acceleration and road grading

OICA suggested again to wait for confirmation of this from the pilot phase testing. The drafting coordinator reiterated that unless otherwise indicated by the pilot phase testing, the acceleration

and road grade requirements will be the same conditions as the real driving emissions (RDE) requirements for all testing and routes, as outlined in EVE-71-02e.

Action items

Decisions

- Battery preconditioning, soaking and charge to be done at 25 degrees Celsius +/- 5 degrees Celsius and include the provisions for prewarming as previously discussed and as outlined in the EVE-71-02e, unless pilot phase testing shows it is not possible.

- Acceleration and road grading to be the same conditions as the RDE requirements on all tests and routes, as outlined in EVE-71-02e, unless pilot phase testing shows it is not possible.

Day 2 – May 29, 2024, 05:30 EDT

1. Introduction, review of agenda

   Documentation

   - EVE-71-01e

   Context

   The EVE IWG co-chairs addressed members and welcomed everyone to the virtual meeting.

   The co-chairs presented the meeting agenda to EVE IWG members. The agenda was reviewed and adopted by the EVE IWG prior to beginning discussions.

   Discussion

   Action items

   Decisions

2. Details on system bench demonstration

   Documentation

   Context

   The topic of participation in the Japanese system bench test demonstration on September 17, 2024, was briefly revisited.

   Discussion

   The co-chairs communicated that if contracting parties are interested in participating in the demonstration, to please reach out to them and the Japanese delegation.

   Action items

   - Contracting parties to reach out to the co-chairs and Japanese delegation if interested in participating in the system bench test demonstration.

   Decisions

3. HDV GTR – Test procedure steps and boundary conditions

   Documentation

   - EVE-71-02e

- EVE-71-05e

Context

This item was set with the objective of discussing and resolving outstanding topics of the eHDV GTR draft text.

Discussion

Breakoff criterion

The American delegation mentioned that having a cumulative UBE could result in a very small value and over multiple tests it is difficult to see how this would work. We could do a similar approach to the chassis dynamometer and have wider tolerances. If the energy consumption over the last 20 miles varies by a certain percentage, then this could be the break-off point. The drafting coordinator stated that they would bring a proposal to the next EVE IWG session.

Steps of the test procedure

No comments received.

Test repetition

OICA expressed that the reason they are unsure about the testing repetition on method 2 is because there is no round trip efficiency validation, but this is something that needs to be ensured for the test. The drafting coordinator explained that for method 1a and 1b there is a check, so if this check is also added for test method 2, perhaps we can eliminate the need for test repetitions. OICA agreed and requested that a point be added to remind everyone why it was removed.

Action items

- Drafting coordinator to add explanation on why the test repetition for method 2 was removed.
- Drafting coordinator to present a proposal on the break-off criterion at the next EVE IWG session.
- EVE IWG to have a dedicated discussion on the eHDV GTR family definitions and the minimum performance requirements.

Decisions

- Test repetitions on method 1a, 1b and 2 to be removed.

4. HDV GTR - Proposal on the use and verification of UBC

Documentation

- EVE-71-04e

Context

OICA presented their proposal on the state of certified energy (SOCE) verification procedure.

Discussion

The Japanese delegation highlighted the four scenarios presented by OICA and asked whether they would be okay with any of these. OICA said that they are alright with all four but prefer the fourth option. The Japanese delegation highlighted that OICA is advocating for the use of useable battery capacity (UBC), but it seems as though the fourth option relies on UBE. The monitoring of battery deterioration is done during discharge and what is being proposed also does not seem to align with that. OICA explained that on-road discharge testing will influence the UBE severely, depending on the different road conditions and factors. This issue does not vary as much when looking at the charged energy. The co-chairs highlighted that OICA appears to still feel that the testing conditions are too unreliable to produce repeatable results. The American delegation stated that the group has discussed many different factors and conditions, but payload may be another option to look at. Regardless, the group should continue to work on the boundary conditions. The UBE discharged is the value we are looking to get, and all the options presented are not suitable for this. The UBE discharged is a very important parameter and while battery chemistries are improving and evolving every day, it is important that we accurately measure and evaluate the batteries. The drafting coordinator expressed that the group is working on the test procedure to ensure repeatability and robustness. Currently, we do not know the future of battery technology. Previously we have had discussions and the contracting parties have expressed that they would like to acquire the UBE as an evaluation metric. Overall, a more controlled testing procedure seems to be the way to go, making sure to not preclude future technologies. The American delegation expressed that they agree with the drafting coordinator and the Japanese delegation's comments. The group needs to work on the boundary conditions of the tests rather than looking at many different approaches to evaluation. The Co-chairs suggested that the group continue to think about the approach as a lot of the elements presented by OICA appear to be external to what the group is looking to develop at this time. OICA stated that they are speechless and very disappointed in the direction and discussion. We are looking for a procedure that is valuable and repeatable. We would like to show you the challenges of eHDV measurement as it is a different animal to LDV even without the consideration of fuel cells. The co-chairs stated that it feels slightly dramatic to say OICA has been left speechless. We have communicated all along that UBE is the targeted metric. This UBC concept seems to keep coming up and we do not want it and we continue to entertain these conversations. We have been very open and continue to reengage in these discussions. Maybe this is just to say that the on-road testing has too much variability and UBE cannot be accurately assessed through this test method. Perhaps one of the takeaways here is that we move to only closed track and dynamometer testing.

Action items

Decisions

5. Closing remarks

Documentation

Context

This item was set with the objective of closing the meeting and looking forward to the next, addressing logistics and miscellaneous topics.

Discussion

The co-chairs indicated that the tentative meeting date for EVE 72 may not work in the United States due to a holiday on June 19, 2024. The secretariat proposed a change of date for the 72nd EVE IWG session to occur on June 17-18, 2024.

Action items

Decisions

- 72nd EVE IWG session to occur on June 17-18, 2024.