EVE-51-08e

Common proposal by EC, USA, UK

On flags and virtual mileage

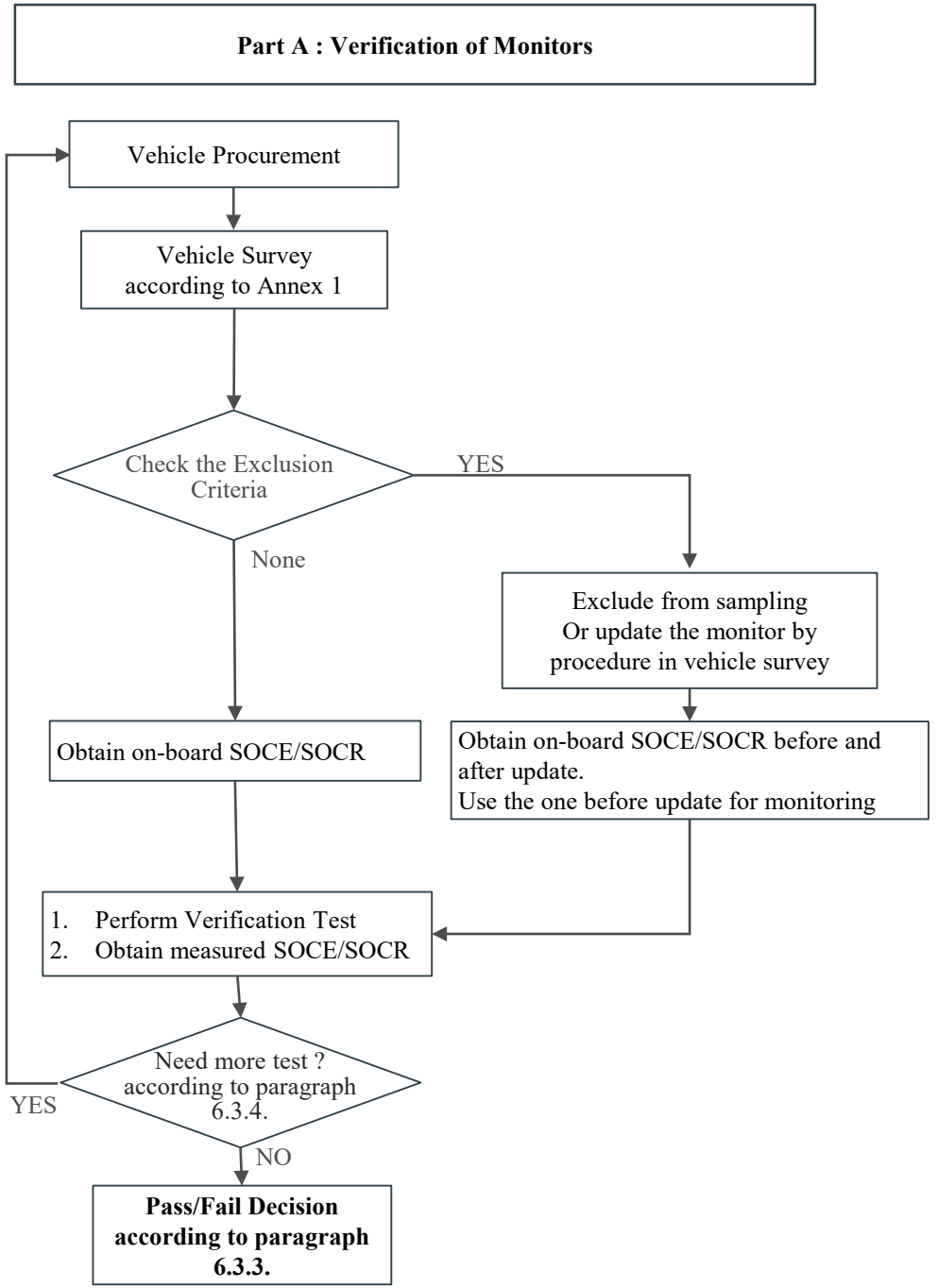
9 July 2021

Requirements

- The manufacturer shall determine the algorithms by which on-board SOCR and on-board SOCE are determined for the vehicles they produce. The manufacturer shall update the on-board SOCR and SOCE with sufficient frequency as to maintain the necessary degree of accuracy during all normal vehicle operation
- **The algorithm behind the monitors is in the hand of the manufacturers, but authorities need to be able to verify whether it monitors accurately.**

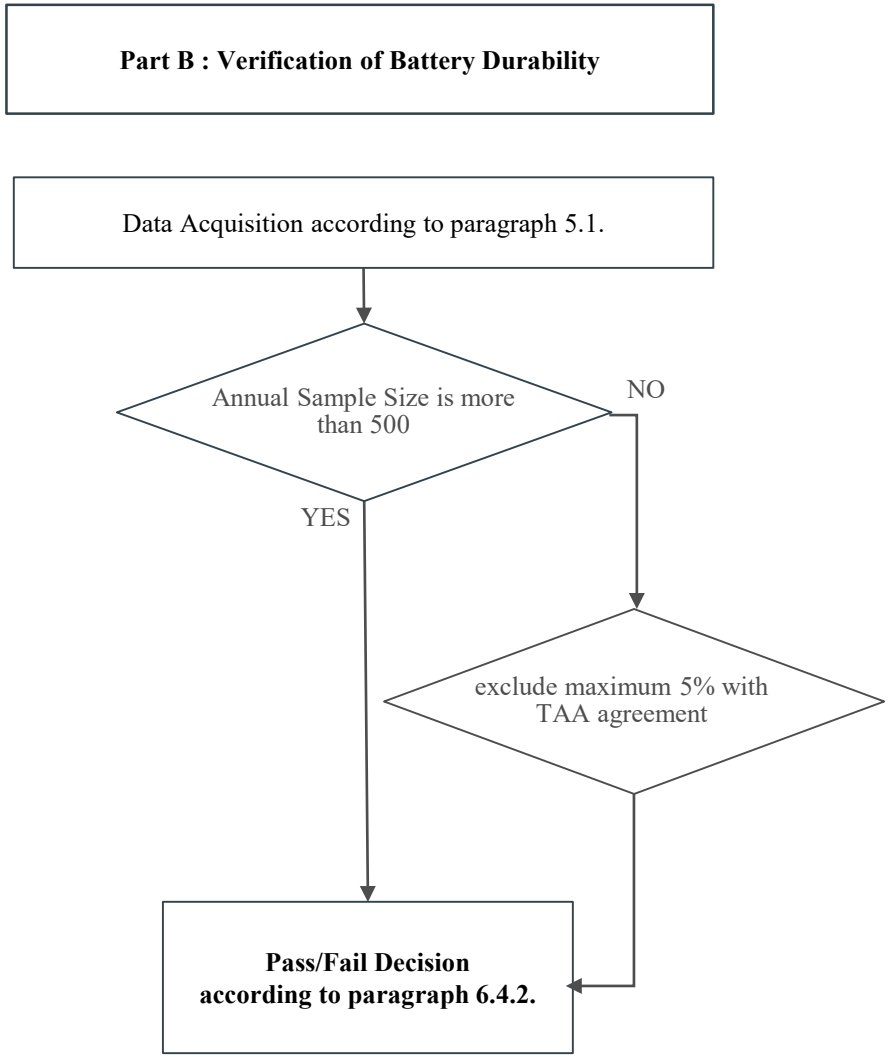
PART A: Verification of monitor

- Select vehicles for testing by using the Vehicle Survey in Annex I.
- New exclusion criteria in order to ensure that the monitor is recently updated:
  - **Was the vehicle stored and not used for the last month?** *If the vehicle was not used for the last month and the tester wishes to use it for testing,* ***it has to be conditioned by driving the vehicle no less than 50 km and in a manner that results in discharge of at least 50% of the usable capacity of the battery, followed by a full recharge (update procedure).***
- *SOCE/SOCR is read and recorded both before and after the procedure above*
- ***For verification:***
  i. *For vehicles that do not fall under the exclusion, the stored value will be used.*
  ii. *For vehicles that do fall under the exclusions, the stored value and the post-drive value will be recorded, with the post-drive value being used to judge the effectiveness of the procedure.*
- *The difference between the SOCE/SOCR values before and after will be used to inform Phase 2 of the GTR development*



PART B: Verification of battery durability

- Large sample of vehicles monitored in order to take a decision
- 90% of the values need to be above the MPR/DPR, i.e. 10% already will include vehicles with more demanding use
- If sample is less than 500 vehicles, on the request of the OEM and with adequate justification, another 5% may be excluded
- No need to add flags to cover demanding/abnormal use, because they can be covered within the 10-15% of excluded values above
- It is practically impossible to review thousands of vehicles to see if they were properly maintain (as in OICA proposal)


Part B : Verification of Battery Durability
Data Acquisition according to paragraph 5.1.
Annual Sample Size is more than 500
NO
YES
exclude maximum 5% with TAA agreement
Pass/Fail Decision according to paragraph 6.4.2.

Virtual km

- *"V2X" means the use of the traction batteries to cover external power demand, such as V2G(Vehicle-to-Grid) for system stabilization by discharging electricity from traction batteries, V2H (Vehicle-to-Home) for utilizing traction batteries as emergency power sources in times of power failure, and V2L (Vehicle-to-Load, only connected loads and home appliances are supplied) for use in times of power failure and/or outdoor activity in normal times.*

- **At the request of the manufacturer** and for vehicles designed with V2X usage, the equivalent virtual km calculated following the equation below will be reported by each vehicle.

- $$\boldsymbol{Virtual\ km} = \left(\frac{\text{total discharge energy in V2X mode } [Wh]}{\text{worst case certified energy consumption of PART B family } [\text{Wh/km}]}\right)$$

- The total mileage used for confirming the compliance with the minimum performance requirements, will consist of the sum of the km driven and the virtual km. The total percentage of the virtual km shall be recorded and monitored.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