Informal document GRPE-85-02e
85th GRPE, 11-14 January 2022
Agenda item 3(a)

Proposals for Future UNR154 Amendment

(based on the observation about GRPE-84-12/13)

prepared by
JAPAN

Proposals

1. Eliminate the unique provision in case that transition cycle number of V_H condition is less than that of V_L condition (Provision_A)

notes : If OICA has a concern on linearity of interpolation line,
number of transition cycle should be same within same interpolation family

<Justification>

(i) may mislead **INCORRECT** interpretation among type approval authorities and manufactures due to extremely complicated provision **Observation_1@slide5**

(ii) have a potential concern to derive **INCORRECT** results during battery durability ISC program under EVE GTR **Observation_2@slide5**

2. Not allow intentional decrease of EAER by manufacture (Provision_B)

<Justification> intentional EAER decrease makes the battery durability requirement under EVE GTR **RELAXED** as a result **Observation_3@slide6**

Timing of Amendment

should be implemented prior to the enforcement of battery durability
(same timing as 04/05 SoA ← expect to include Euro7)

Concrete Text Proposals 1

Annex B8

paragraph ~~4.1.2.~~ ~~4.1.3.1.~~ ~~4.2.2.~~ ~~4.2.3~~.

Provision_A

~~In the case that the interpolation method is applied, k shall be the number of phases driven up to the end of the transition cycle of vehicle L, n_{veh_L}.~~

~~If the transition cycle number driven by vehicle H, n_{veh_H}, and, if applicable, by an individual vehicle within the vehicle interpolation family, $n_{veh_{ind}}$, is lower than the transition cycle number driven by vehicle L, n_{veh_L}, the confirmation cycle of vehicle H and, if applicable, an individual vehicle shall be included in the calculation. The CO_2 emission of each phase of the confirmation cycle shall be subsequently corrected to an electric energy consumption of zero ($EC_{DC,CD_i} = 0$) by using the CO_2 correction coefficient according to Appendix 2 to this annex.~~

Annex B8

~~4.5.8.~~

Provision_B

~~Adjustment of values~~

~~The individual EAER value determined in accordance with paragraph 4.5.7.3. of this annex may be decreased by the manufacturer. In such cases:~~

~~The EAER phase values shall be decreased by the ratio of the decreased EAER value divided by the calculated EAER value. This shall not compensate for technical elements that would effectively require a vehicle to be excluded from the interpolation family.~~

Concrete Text Proposals 2 (in case that OICA has a concern on linearity of interpolation line)

Main Body

6.3.2.2. Interpolation family for NOVC-HEVs and OVC-HEVs

In addition to the requirements of paragraph 6.3.2.1., only OVC-HEVs and NOVC-HEVs that are identical with respect to the following characteristics may be part of the same interpolation family:

(a) Type and number of electric machines: construction type (asynchronous/ synchronous, etc.), type of coolant (air, liquid) and any other characteristics having a non-negligible influence on CO_2 emission and electric energy consumption under WLTP conditions;

(b) Type of traction REESS (type of cell, capacity, nominal voltage, nominal power, type of coolant (air, liquid));

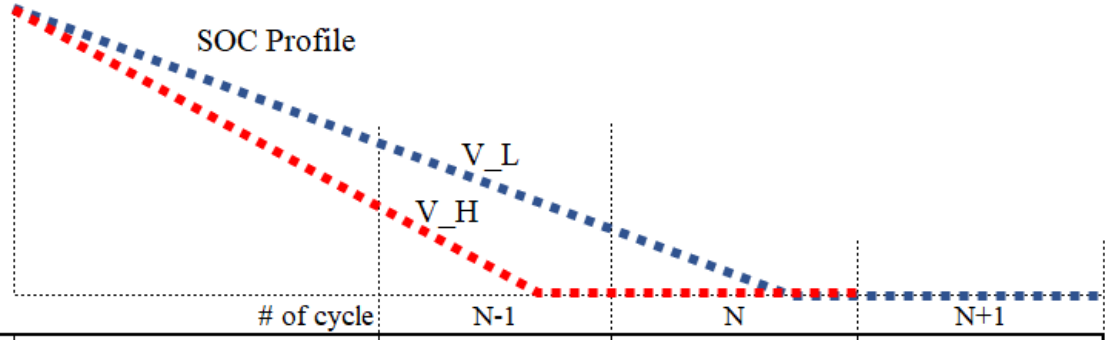
(c) Type of electric energy converter between the electric machine and traction REESS, between the traction REESS and low voltage power supply and between the recharge-plug-in and traction REESS, and any other characteristics having a non-negligible influence on CO_2 emission and electric energy consumption under WLTP conditions. At the request of the manufacturer and with the approval of the approval authority, electric energy converters between recharge-plug-in and traction REESS with lower recharge losses may be included in the family;

(d) The difference between the number of charge-depleting cycles from the beginning of the test up to and including the transition cycle shall ~~not~~ be same~~more than one~~.

Observation_1

Under the current provision_A, **two (2) different CO_2 for V_H condition** need to be calculated according to parameter.

Without the current provision(A), identical value is expected theoretically.

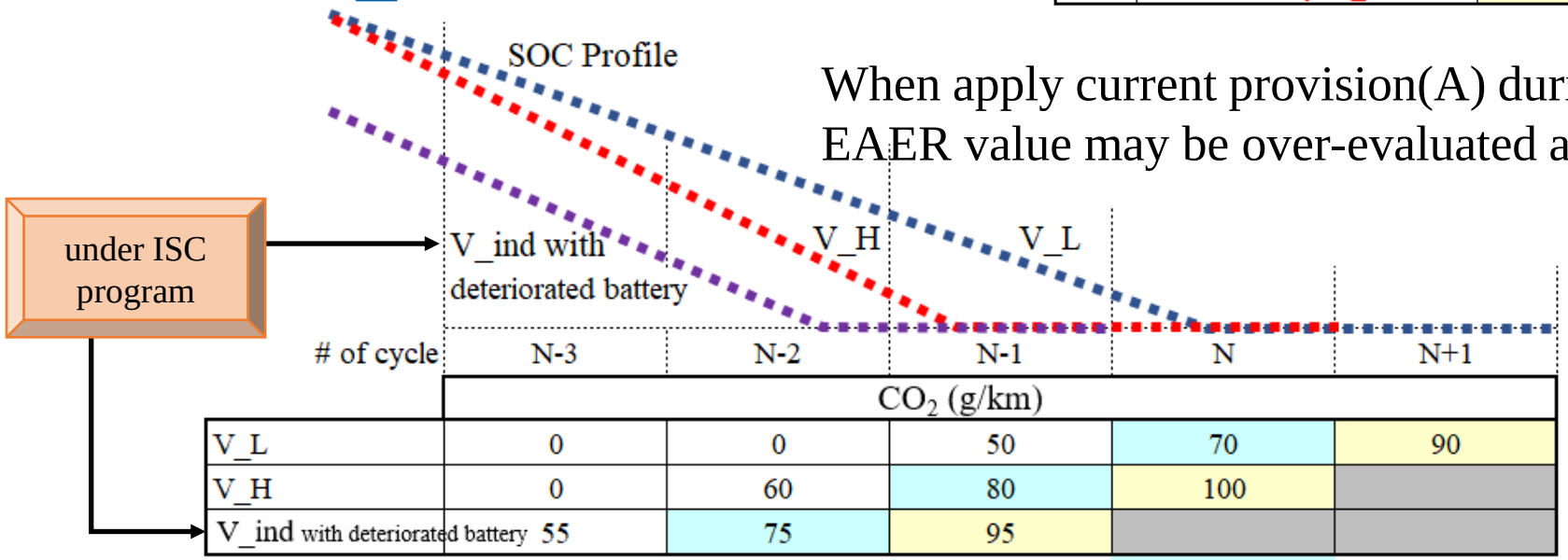


	# of cycle	N-1	N	N+1
V_L			transition (N)	confirmation (N+1)
V_H		transition (N-1)	confirmation (N)	

	parameter	CO_2 processing		
V_L	CO_2, Fuel Consumption, **Fuel Efficiency**, EAER, **R_CDA**	no correction	no correction	no post processing
V_H	CO_2, Fuel Consumption, EAER	no correction	SOC zero balance	
	Fuel Efficiency, R_CDA	no correction	no post processing	

Observation_2

When apply current provision(A) during ISC under EVE GTR, EAER value may be over-evaluated and it misleads false pass.



	CO_2 (g/km)				
V_L	0	0	50	70	90
V_H	0	60	80	100	
V_ind with deteriorated battery	55	75	95		

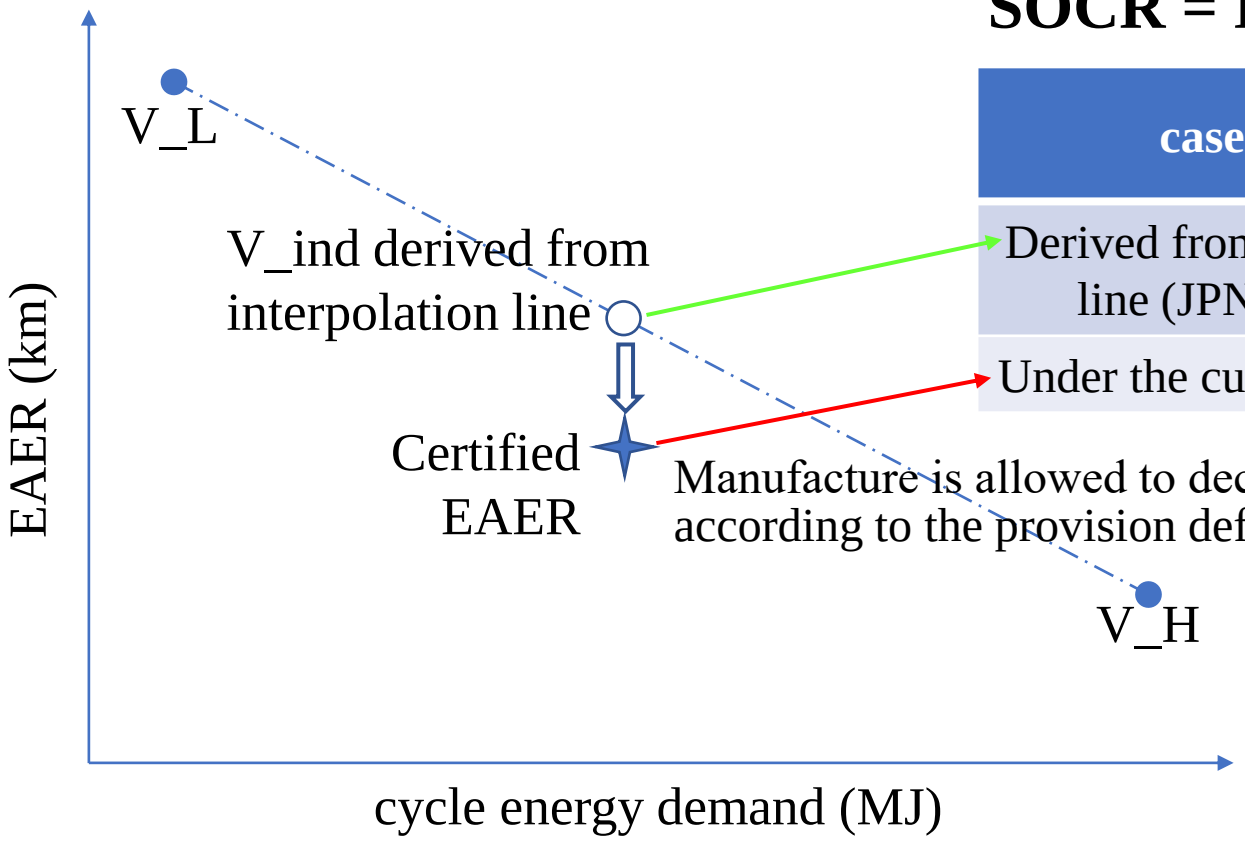
transition cycle
confirmation cycle

Case study (in case of N=5)

EAER (km)		
JPN Proposal	current provision	
	homologation	ISC
84.33	NA	NA
59.80	59.80	NA
37.53	NA	46.91

25%

Observation_3



SOCR = EAER @ ISC / Certified EAER

case study	Certified EAER	EAER @ ISC	SOCR	Decision
Derived from interpolation line (JPN proposal)	70	55	79%	Fail
Under the current provision	68		81%	Pass

Manufacture is allowed to decrease "Certified EAER" according to the provision defined in Annex B8 paragraph 4.5.8.

Current provision_B may mislead **false pass** under SOCR requirement with few disadvantage for manufacture