Update Needs on GTR21

~ concerning Integrated Hybrid Systems ~

prepared by Japan

21st September 2022

Concerns on Integrated Hybrid Systems

■ Backgrounds

GTR21 describes the test procedure to determine the hybrid system power.

Since the hybrid system has a variety of configuration and is on-going technology, some of current test procedure may not be feasible for the specific configurations (please refer slide_3 for one of concrete problem).

■ Way Forwards

- ✓ List up the existing and/or potential problem under the current procedure
- ✓ IWG member is expected to provide the possible solutions*

  * : feasible, realistic, consider the balance between value and burden and so on including COP, ISC

- ✓ GTR will be updated, if necessary

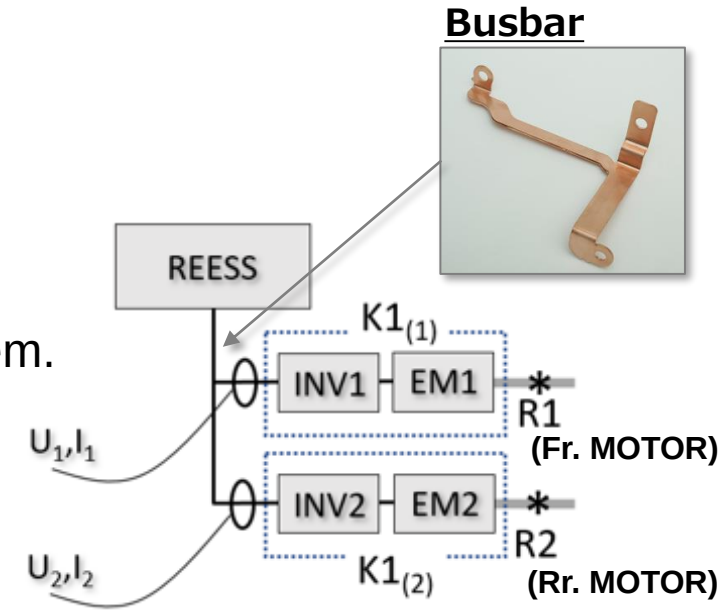
<sample> Problem and Solution

■ Scene

Calculation of front and rear motor output in AWD system

■ Problem

- **Measurement** Busbar are used in integrated hybrid systems.
  Current/Voltage sensors are difficult to install in this type of system.
  Reason is lack of space and lack of electric safety.
- **Current text** Alternative method defined in 6.1.2. (demonstrate accuracy)
  doesn't work since no demonstration is feasible



■ One of the possible solutions

Calculate R1/R2 branch power based on
(1) measured REESS power (**U, I**) before distribution and
(2) distribution ratio (**DR(1), DR(2)**) by torque command value from CAN

Power at R1 [kW] = (U [V] * I [A] / 1000) * K1(1) * DR(1)

Power at R2 [kW] = (U [V] * I [A] / 1000) * K2(1) * DR(2)

※Distribution Ratio (DR) : from CAN (%)