

Sébastien Paternotte

From: Benson, Arlina <arlina.benson@vda.de>
Sent: 17 August 2023 14:46
To: Sébastien Paternotte; Bodmann Jochen (CC/EYB7); Kenneweg, Volker (000); HUNOLD_Heiner; StephanSchilling; Stueble Jonas (XC/EYA3); Németh Huba Dr.; Abdur-Rahman.Abdur-Razak@dft.gov.uk; frsr@fstyr.dk; rita.beck@kba.de; Rieg, Andreas (019); FontaineOlivier; jian.long@hirain.de; Rangaraj, Charan Raj (I/ET-B2); Traub Tobias Christian (XC/EKE2); juhani.puurunen@traficom.fi; Yassine Ghorbel; Rumer, Wolfgang (I/EM-66); anders.nilsson@haldex.com; marcel.kruempelmann@zf.com; at.ishiguro@hino.co.jp; katsuhiko.nagura@udtrucks.com; a.aghababaei@eu.denso.com; d.kremer@eu.denso.com; sebastian.kirch@audi.de; ArturBreidt; TillReucker; tianfugang@catarc.ac.cn; ligt1@changan.com.cn; shinichi.kato@daimlertruck.com; seiniger; Shiomi, Yukihiro; SEGLO_Fredrik; kinoshita-h2te@mlit.go.jp; TORUKOJIMA; urate@shinsa.ntsel.go.jp; TSUBURAI Yoshihisa; yoshinari_sakai@jtekt.co.jp; ChristophAdam; KyuwookJeon
Cc: Artur Breidt; Marc Van Impe
Subject: GRVA SIG EMB Expert Group on Energy meeting minutes 16082023
Attachments: 2023-08-16_EBSIG_Report Sub Group Energy_to SIG-EMB.pptx

Dear Expert Group,

please find below the meeting minutes from our last Sub-Group meeting, which took place 16th August 2023, as well as the final presentation, which will be subject at the SIG-02 meeting next week.

4th Meeting SIG EMB Expert Group on Energy

Date: 16th of August 2023

Time: 09:00 AM - 11:00AM CET

Venue: TEAMS

Participants:

Christoph Adam, Amin Aghababaei, Arlina Benson, Daniel Kremer, Heiner Hunold, Juhani Puurunen, Volker Kenneweg, Marcel Kruempelmann, Li Guanting, Nadir Syed, Anders Nilsson, Rita Valeria Beck, Till Ruecker, Wolfgang Rumer, Stephan Schilling, Fredrik Seglö, Jonas Stueble, Yassine Ghorbel, Jeon Kyu Wook

1. Rules of Compliance
 - Arlina Benson (VDA) introduced the rules of compliance to be respected in the meeting.
2. Adoption of the Meeting Minutes of the EMB Sub-Group Meeting from August 8th
 - The meeting minutes of the last meeting are approved.
3. Review **and Adoption** of the Report to EBSIG on the Energy Questions
 - Heiner provides a summary of the presentation which was sent to all participants ahead of time: *"2023-08-09_Sub Group Energy_working material_4th session_EMB Industry Meeting (230810)_V01"*, as well as pointing out all changes made
 - Review of the tasks given by GRVA SIG on the Electromechanical Braking:

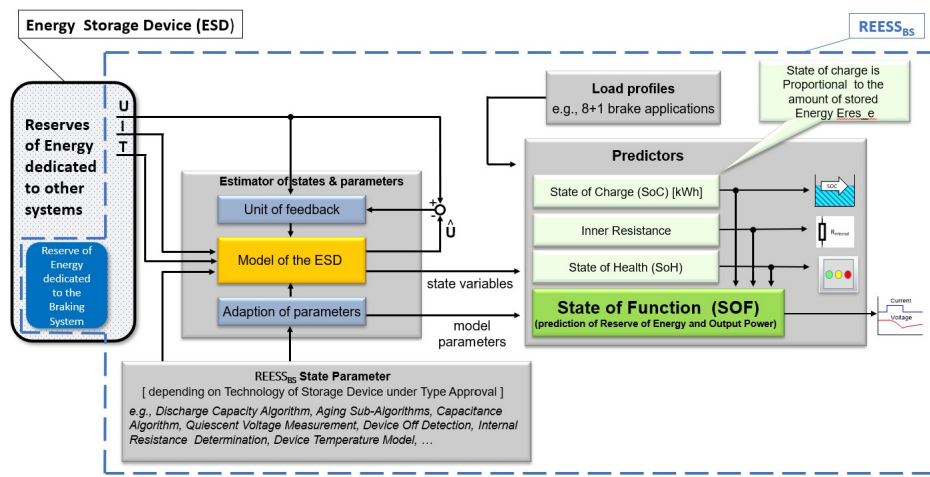
Provide confidence that technology is able to do the following:

- 1) Measure and/or monitor in real time the energy available in the reserve in all operating conditions and over the lifetime (high temperatures, ageing, ...).
- 2) Compare that measured value with the known threshold value required to meet the specific performances required by the regulations. Note: The known value means the value identified by the manufacturer to fulfil the specific requirements of the regulation.

- 3) To be able to generate the warning to the driver in real time in accordance with the known threshold value.

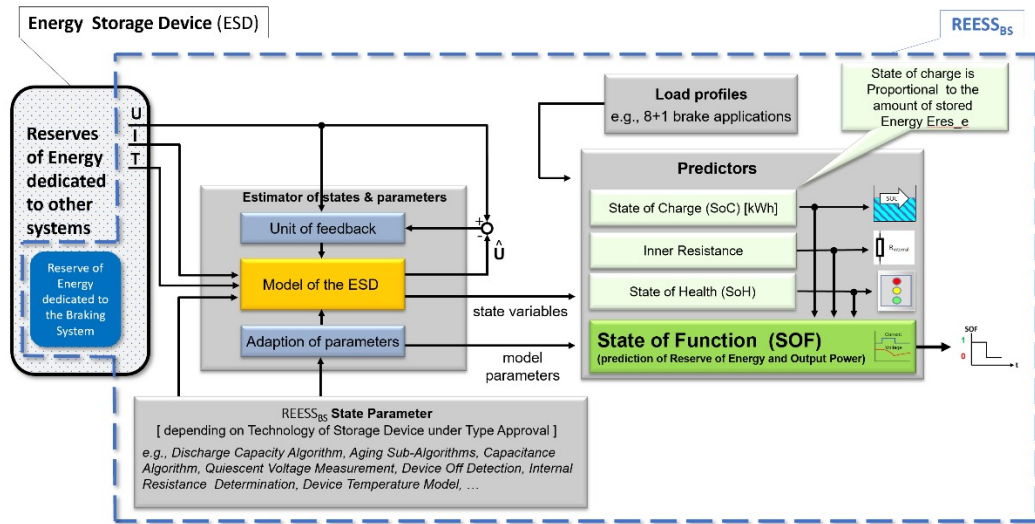
- Slide 4:

Rechargeable Electrical Energy Storage System for Braking Systems (REESS_{BS})



- State of Function (SoF) has been adopted by industry, especially by safety engineering.
 - The SoF takes a close look at the predictions of the parameters.
 - The REESS must ensure the function, which is the output of the power.
 - The SoF ensures that the REESS_{BS} has enough power for the time being as well as predicting enough energy for future braking maneuvers (e.g., next 8 braking maneuvers). This means the SOF makes a prediction of Reserve of Energy and Output power which means a nominal state of function is fulfilled.
 - The dotted blue lines show the system boundary.
 - The lead-acid battery was used as an example for the scenarios. This does not mean that other batteries are excluded.
- Background information:
- Within the Subgroup Energy we made the approach to start from the well-understood Lead Acid Battery. After this we transferred the predictors (SOC, SOH, Inner Resistance) to any kind of Electrical Storage Device (ESD), which include Lithium-Ion Batteries (NMC, LTO, LFP, ...) and super-caps. Due to a lack of time, there was no opportunity to check the use cases in detail on their validity against any kind of ESD's. Thus, we kept the scenarios dedicated to the lead acid battery technology.
 - SoF – Jonas Stueble made small changes of the presentation, slide 4:

Rechargeable Electrical Energy Storage System for Braking Systems (REESS_{BS})



- The Output power is explained by a constant current to the actuators, provided by a dedicated voltage.
- The SoF is reported as a binary value to the braking system. The function of the battery shows a “yes” or “no”. This is answered by the current and voltage output.

4. Summary

- The Expert Group adopted the Presentation inkl. The Changes Jonas Stueble made on Slide 4.
- This presentation will be sent to the Chair, Bernie Frost, to be uploaded to the wiki-page, as well as being subject to the upcoming SIG-02 meeting.
- The newly changed presentation will be sent to the Expert Group, along with the meeting minutes.
- **As there will be no further online-meetings for the SIG EMB Expert Group on Energy: Arlina proposed that the meeting minutes will be seen as approved by the Expert Group, shall there be no remarks made by Monday, 21st August 2023, 5pm CET.**

SIG-02 will take place from 22nd – 24th August 2023 in Paris, at the OICA-Office

Thank you all for your dedicated work within this Expert Group!

Kind Regards,

Arlina Benson

Technical Officer Technical Regulations & Materials
Department Automotive Technologies & Eco-Systems

Verband der Automobilindustrie e.V. (VDA e.V.)
Behrenstr. 35, 10117 Berlin

Registrierter Interessenvertreter - R001243

+49 30 897 842- 280
+49 151 1765 1923
arlina.benson@vda.de

VDA www.vda.de | [LinkedIn](#) | [Twitter](#) | [YouTube](#)
IAA www.iaa.de | [Facebook](#) | [LinkedIn](#) | [Twitter](#) | [YouTube](#)

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