17 October 2019
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# CHAdeMO Tech WG minutes 17/10/2019

## Participants

- **Total 48 persons**.

## Topics

1. **CHAdeMO tech WG activity overview, strategy and road map** by Tomoya IMAZU, CHAdeMO Technical Committee Chair/Deputy General Manager, e-Mobility Group, Resource Aggregation Office, TEPCO
2. **ChaoJi / CHAdeMO 3.0 development update** by Tomoya IMAZU & Hidetoshi KUSUMI, CHAdeMO High Power SWG/Project Manager, Electrified Vehicle System Engineering Management, Toyota Motor Corporation
3. **CHAdeMO 2.0 ultra high-power cable and connector** by Robin Prunte, Research & Development, Fujikura Technology Europe, on behalf of Keiji YAHAGI, Manager, Distribution System Engineering, Fujikura Components Ltd**.**
4. **CHAdeMO Plug&Chage (PnC) task force update** by Uwe LIKAR, CHAdeMO EU PnC Task Force Chair/Senior Manager, Advanced Engineering Planning, Mitsubishi Motor R&D Europe GmbH
5. **ISO15118 high level data communication over CAN** by Olaf SIMON, Technical Research, SEW-EURODRIVE GmbH & Co KG
6. **CHAdeMO in Europe** by Tomoko BLECH, CHAdeMO Association Europe
7. **High power Charging System by paXos Engineering** by Julian MUENZBERG and Marius NENNEWITZ, Project Engineers, paXos Consulting & Engineering GmbH & Co. KG

**Distributed materials** – none. Presentations with the presenters' agreement are uploaded on the CHAdeMO members page.

## Discussions

### 1. CHAdeMO tech WG activity overview, strategy and road map

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- (CHAdeMO/ChaoJi) System AA in the EN standard. We need a real stakeholder in Europe to control this process.
- (Participant) We are a member of CENELEC – we can be the account for CENELEC. My understanding is that currently CENELEC is not taking any exclusive project. The Chinese system was excluded at the IEC level?

- (CHAdeMO/ChaoJi) No, it was CENELEC. Can you check to learn about the process?
- (Participant) Yes we can do that.

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- (CHAdeMO/ChaoJi) Same plug has 2 softwares. In implementation, we need to select Chaoij1 or Chaoji2 vehicle types market by market.
- (Participant) How do you prevent the old vehicles to use new charger?
- (CHAdeMO/ChaoJi) Dual charger is recommended for the transition period.

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- (Participant) The IEC process is fixed?
- (CHAdeMO/ChaoJi) IEC proposal is scheduled for next week.

**2. ChaoJi / CHAdeMO 3.0 development update**

- (Participant) Is there a temperature sensor inside the plug? CCS does it.
- (CHAdeMO/ChaoJi) Chaoji project will comply with the standard. 2 sensors for the connector and 2 sensors for the inlet. Independent temp measurement. Same safety level for Chaoji and CCS. IEC62196-3-1.
- (Participant) How about communicating short circuit capacity?
- (CHAdeMO/ChaoJi) For now no. We will add a new communication. If not zero, 10kA side.
- (Participant) How about the safety aspect? 1500 volts. Would you consider such a vehicle to a future charger? Potential hazardous situation? Mitigation possible?
- (CHAdeMO/ChaoJi) With CHA2.0 we have voltage/current categorisation initial communication. Current max operation endurance voltage can be exchanged between the EV and EVSE. As far as CAN communication is ok, there is no problem. If CAN goes wrong, we could have problems. Non-high-level communication. Physical wired info exchange must be clear.
- (Participant) In EU, when anything goes 1kV, additional license is needed. This could be problematic for installers.
- (CHAdeMO/ChaoJi) Regulations differ from area to area. Would like area specialists to find solutions for this. In Japan over 750V DC is not allowed in reality, so adaptation was needed to keep it to 750V.
- (CHAdeMO/ChaoJi) So long as mating phase for 1500V, system voltage position can be chosen regarding the market demands or regulations. This may be different for passenger cars and heavy-duty vehicles.
- (Participant) Is the future plan to have only one plug to replace CHAdeMO / CCS, or will we have 2 inlets? We have 2 inlets on the vehicle side. EU and CHAdeMO inlets.
- (CHAdeMO/ChaoJi) One DC is better. One for CHAdeMO and GB/T. The choice of Combo1, Combo2, etc. are decisions of the car OEMs for EU and NA markets. For now, we have no answer. Maybe there will be a unified solution in the future, or not. In my opinion, for

China, Japan and some Asian markets, it will be the Chaoji inlet/coupler. It makes sense for OEMs to integrate Chaoji. For EU and NA, there are 2 possibilities. 1) infra side could be Chaoji, or 2) Combo2 and Chaoji for Europe.
Our tech target is that Chaoji can be used for all markets – but it's a market decision, which is out of our technical work. CHAdeMO can go beyond standards.

- (Participant) Regarding the backward compatibility, the EV will distinguish Chaoji1 and Chaoji 2?
- (CHAdeMO/ChaoJi) Yes. Detected by CAN protocol starting session. 15118 also.
- (Participant) The voltage is different. Don't see how that's feasible.
- (CHAdeMO/ChaoJi) Chaoji couplers are the same.
- (Participant) Exiting GB/T via the new Chaoji plug?
- (CHAdeMO/ChaoJi) GB/T already exists. The new protocol allows to go up to 600A. Chinese limitation is 750V. Now we are going to 1500 V. This can change in the protocol.
- (Participant) There are GB/T 2011 and 2015. This will be communicated through Chaoji – 2011 and 2015 - through the charger, or will there be Chaoji 2020?
- (Matthias) That is a problem for OEMs. My Point of view is that if I offer a car, the customer wants the car to offer all 3 protocols. (Adapter or in the car?) 2 or 3 resisters. In the car. Same for Combo cars.
- (Participant) Common negotiation exists? What if CHAdeMO / GBT are different?
- (CHAdeMO/ChaoJi) That's no issue. Markets are clearly separated.
- (Participant) No clash?
- (CHAdeMO/ChaoJi) GB/T based CAN has frequency of 250kHz. CHAdeMO CAN has 500 kHz. Chaoji 1 and 2 distinguishes this, while the coupler is the same. ChaoJi spec requests that CAN should be started from the EVSE. The EVSE that has dual CAN rates needs to always start from 250Hz, then switch into 500Hz if there is no response from the vehicle. China vehicles have 250, Japan 500.
- (Participant) will it be specified clearly?
- (CHAdeMO/ChaoJi) Yes.

**3. CHAdeMO 2.0 ultra high-power cable and connector**

- (Participant) It is a challenging task. Already 400A?
- (Fujikura) Yes. 400A x 1000V.
- (Participant) Looking at the previous slide for cable and connector. Which standards?
- (Fujikura) The cable with connector, IEC62196-3, Cable IEC 60502, maybe? Discussing with TUV.
- (Participant) Which kind of refrigerant do you use?
- (Fujikura) Oil-based
- (Participant) The current standard is important, but with the experience you acquired through this R&D, are you going to the Chaoji direction?
- (Fujikura) We will look into it. Chaoji and CHAdeMO 3.0.

- (Participant) Regarding the test condition, how do you guarantee 23k? How did you measure? Where are the sensors?
- (Fujikura) In the Crimping area.
- (Participant) Putting the sensors as close as possible to the contact zone is best.
- (Participant) Are you going to offer a complete solution for liquid cooled cable, including a pump, heat exchanger, etc?
- (Fujikura) The complete solution is not ready yet.

**4.5 CHAdeMO PnC task force update / ISO15118 high level data communication over CAN**

- (Participant) BUS load and latency, can be an issue.
- (Olaf Simon, SEW) Power transfer can be defined by CHAdeMO. Charging control can be defined by CHAdeMO, is my recommendation. It does not make sense to switch the functionality done by CHAdeMO and switch to 15118. It can be just 1 message of 15118 that you may not use. Cyclic transmitted information.
- (Participant) The rest of the 15118 comm sequence is used? Importing a lot of functions?
- (Olaf) additional services for billing and encryption are used. Everything implemented in the stack is used. All that is cyclical running in parallel we should keep CHAdeMO.

**6. CHAdeMO in Europe**

- (Participant) What's the Directive revision schedule?
- (Tomoko) STF report is scheduled to be adopted in their plenary in the end of November. We expect public comments to be open early 2020, then the eventual revision process.

**7. High power Charging System by paXos Engineering**

- (CHAdeMO/ChaoJi) What's your view on certification? Looking into IEC 62196-3 is recommended. You can find the safety concept behind the standard.

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**Participant list**

| First name | Family name | Affiliation |
|---|---|---|
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| Samuel | Sanchez | Ampere Power Energy |
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| Igor | Malizia | Bitron S.p.a. |
| Thorsten | Kuenzig | BMW AG |
| Daren | Davoux | BTCPower Inc. |
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| Anita | Athanasas | comemso |
| Guillaume | SIMON | DBT-CEV |
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*CHAdeMO members and external speakers are not included.