

Minutes of meeting
CHAdeMO European Members Meeting

Madrid, December 10, 2010

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Introduction

Introduction – Welcome Speeches

By Mr. Jorge Sanchez Cifuentes – ENDESA (Deputy Director Electrical Vehicles)

Mr. Anegawa, CHAdeMO (Chief Secretary)

ENDESA, early supporter of CHAdeMO since its inauguration in Japan last March, is proud to support CHAdeMO’s development in Europe and welcome all European members today in its Madrid headquarters.

Mr. Anegawa welcomes all European members whose 1st gathering today is an historical milestone for CHAdeMO in Europe.

Part 1 : Discussions about Standardization Activities

Whereas CHAdeMO is starting to be used on the streets, its protocol version is now 0.9. It has room for 10% evolution and add-ons in near future.

We will review of ongoing standardization processes in Europe :

Standard discussed at the IEC :

- **IEC 61851-23** : DC standard requirement
- **IEC 61851-24** : Communication protocol
- **IEC 61851-1** has been an historical one. Now it is just under revision process and almost finished (final version expected in 2011)

Communication and control protocol are often mixed, whereas they have 2 different targets and specifications : :

- control of the charge is aimed to maintain the safety of the charging process
- protocol communication is aimed to enable compatibility with all EVs,

IEC 61851 - 23 and **-24** are brand new and do not mention detailed document for DC charger nor communication. Japanese group therefore proposed to establish a DC charge working group and a draft for its standardization. This proposal was established in spring 2010 by Mr.Serge Roy (a former Hydroquebec EV engineer).

- **IEC 62196-1** : plug, socket outlets and vehicle couplers (general).
this group has no undergoing activity

-IEC 62196-3 and IEC 61851-24 : standardization of the DC connector

Here is the status of DC connector standardization worldwide :

Japan :	connector : CHAdeMO -	communication : CAN
US :	connector : Combo of AC type 1 –	communication : PLC or in-band, or CAN
Germany :	connector : Combo of AC type 2 –	communication : PLC or in-band
China :	connector : DC dedicated –	communication : CAN

GERMANY

Currently in Europe, only France and Germany are not welcoming CHAdeMO. History teaches us that first runners don't always win : in EV especially, late runners may get advantage by getting benefit of the charging infrastructure already in place. **Governments wrongly think that setting up a standard brings an advantage.** This is wrong, but some countries like Germany are following their strong culture of standardization

Germany and the US support combo connector, and have undergoing discussions about its best design.

German OEMs want a compact and unique penetration point to the car, using Mennekes 44kVA AC connector. Only Daimler officially does not give up the AC fast charge (22 kVA only, but not 44 kVA like Renault). It is the only German OEM willing to establish AC quick charge.

This issue is political rather than technical. I was surprised that most of German OEMs' engineers think the combo connector is too difficult to implement, but they are probably following the request from upper management who want to have one penetration charging point in the car. Frankly, to develop an EV, I think top-down decision does not work, because technical decisions shall rather be handled by technicians.

By the way, some companies consider inductive charging for AC slow charge. If this becomes a standard in the future AC slow charge, the AC would have to be removed from the Combo connector. Keeping AC and DC connectors separated is better, as both connectors standards would evolve independently.

PSA : over a *single* EV's lifetime, we cannot **afford a** change from CHAdeMO connector to Combo or another one. If the Combo connector ever comes true, there would therefore be cars charging with CHAdeMO connectors and other cars with Combo. But we think the combo connector **could** probably be harder to insert into the car (more high strength pins). We see (suppress only)-- one advantage of the combo connector : that all charges (slow /fast) are done on one same side of the car.

Think Global believes that AC and DC connector shall be separated, and also in the future we think more than 50kW DC quick charge will be possible, but the Combo connector brings issues. As EVs will be charged by either AC or DC, we see no reason to bring a combo connector which is too complicated for the user. Easy handling is necessary for drivers.

Anegawa : this is not true to say that the "all in one" Combo is more user friendly because in fact the electricity is different and has a different usage. In addition the safety issues are different for AC and DC, and should not be mixed.

XX : if an EV life is 10 years, why not bringing several connectors to the market ? It would just be an infrastructure issue by connecting different types of charger to the grid.

Besides above standardization groups, the CHAdeMO standard is already in usage on the market with a realistic and concrete proposal, whereas German and US proposals are under construction. Germany and the US strictly prefer one penetration point into the EV and therefore promote the combo connector. CHAdeMO think they will take at least 2 years to achieve some conclusion.

It is impossible to wait for 2 more years, now that actual EVs are on sales. So CHAdeMO tries to propose the CHAdeMO connector as this DC connector standard.

For enabling the future of EV, CHAdeMO is against making compromises that would limit or delay the development of EVs. CHAdeMO is pushing to separate the AC and DC connectors. As a compromise these 2 penetration points could be gathered in one location on the car body.

Anegawa : CEN-CENELEC has received a mandate in March 2010 to standardize a connector before March 2011. According to CEN-CENELEC Chairperson Mr. Kirsher, CEN CENELEC immediate focus is on AC charging standardization, and for DC connector more work will be necessary. In case of Combo connector, since it is neither AC nor DC ,CEN CENELEC would have problems to work on its standardization.

By the way I heard that French and German members of CEN CENELEC have difficulties to raise a consensus on the AC charge standard.

Think : the mandate of EC doesn't say that travelling Rome – Paris shall be done with one standard. It does not say if the charge shall be AC or DC. AC has to be standardized first (debated type 2 and type 3). The combo came in the discussion very late. The focus group shall make a proposal, not a standard. They have no mandate to define a standard.

Nissan : the idea of a Combo is quite good but too late because if it comes true, there will be already so many cars on the market that it will be difficult to set up. Even for AC, there is already AC standard : France will go type 3, Germany will not. Anything that comes late is very destructive. It brings doubts to investors. Nissan is working to bring stability. Legacy is key driver for Nissan and the Combo is a destructive issue. The only thing that counts is what will be on the market, so Nissan wishes QCs to be deployed quickly and stop discussions on papers while the car are on the streets.

Anegawa : I do not want to bring trouble in your minds, but only address what CHAdeMO could propose as contingency plan. CHAdeMO shall anyway pay attention to US and German moves in case they become a standard. CHAdeMO shall discuss with them to harmonize the CHAdeMO and the potential combo connector. German OEMs don't say they don't like CHAdeMO but they want a more compact connector. So maybe CHAdeMO shall work in this direction.

PSA comments : it is a very valuable work to find a way between Combo and CHAdeMO. For car OEMs, if Combo becomes the standard in 4-5 years, it needs to be prepared now.

ONE : It is necessary to avoid the same situation as AC / DC quick charge : bringing a 3rd type would probably disturb the investment in the infrastructure.

Questions to DC charger manufacturers : Which would be easier to handle for a DC manufacturer : whether changing the shape of the connector, or changing the protocol ?

=>**Epyon** : this issue is on the EV side which lifetime is longer

=>**ABB** : it is easier to change the physical interface while keeping the same protocol. If the protocol is also changing, the upgrade would be more difficult. Our position would be to sacrifice the connector shape, rather than to change the protocol.

CHINA

=>**Epyon** : CHAdeMO is only working with Japanese EVs and this is bringing problems to have it adopted as a standard in Europe. What about China?

Anegawa : CHAdeMO was created to remove its Japanese image (in that sense I should not be heading it, CHAdeMO would need a European face !).

CHINA is flexible; they prefer a dedicated AC connector and a dedicated DC one, with a basic concept which is almost the same as CHAdeMO. CHAdeMO is in relation with the government, and **BYD**. Since last April, CHAdeMO has continuously held discussions with BYD and the State Grid Authority, and Nissan is leading these discussions, explaining the CHAdeMO concept. The Chinese DC connector looks like a Mennekes one, but its concept is like CHAdeMO, using CAN communication protocol with the same basis as CHAdeMO. This is because the Chinese government asked China State Grid and

Nissan to set up these discussions for the future of China EV. However, CHAdeMO has not released its complete specifications to China.

Many Chinese organizations are contacting CHAdeMO to produce DCQC, but it is forbidden by Chinese authority in order to only promote the Chinese standard.

CHAdeMO works to keep the compatibility between EV and chargers. But in China, they have only written down a technical specification which is not as detailed/complete as CHAdeMO. CHAdeMO believes CHINA will face problems of compatibility between the EV brands (the Government informed us their protocol was only a tentative standard for demonstration in 10 cities). CHAdeMO offers help to Chinese government.

Some Chinese OEM are working seriously to develop CHAdeMO EVs, but their name is confidential. We can introduce connector manufacturer from CHINA as well as charger manufacturer from China.

USA :

=>the situation in the **USA is related to the SAE** strong influence by **GM, Ford, Chrysler** and their veto right (in comparison to Nissan, Toyota etc). **SAE** is officially a neutral and voluntary-based company, but overwhelming members are coming from US OEMs, so do voting rights. CHAdeMO proposed to SAE the CHAdeMO standard in September 2009.

-J1772 connector Working Group (Gery Kissel, chairman) – supporting the GM combo connector solution

-J2847 Communication technology (Ford Rich Scholler, Chairman) – supporting the PLC communication.

After introducing CHAdeMO, GM officially proposed the Combo design. In March 2010, they should have fixed the design of the combo connector, but the time schedule was delayed; PLC communication background is influenced by the powergrid situation. NIST strangely tries to bring a communication system based on PLC, however the DC connector design is expected at the end of 2011.

Even in Europe there is a different PLC protocol in each country. There are several designs in fact. Frequency, speed... the technical details don't allow standardization at present. In theory, it is very difficult for PLC to achieve the same quality as the CAN analogue communication.

As a DC charger specialist, CHAdeMO think it won't be possible to apply the PLC to DC charger due to the QC's IGBT noise. Even though the CAN communication is very robust, it is difficult for all DCQC manufacturer to remove the noise from the IGBT. For the PLC it is clearly impossible to remove this noise influence on the communication quality.

GM recognizes it gets pressure from the US government to lead the clean vehicle market, which is quite difficult to cope with. Before understanding the CHAdeMO concept, GM was only thinking of plug in hybrid. That may be why GM is now interested in the combo connector because it would give a unique connector for PIHV and EV.

It is a fact that no US OEM seriously considers CHAdeMO : no one is working on pure EV (Chrysler quit their EV project when Fiat entered in their capital). Fiat has no interest in CHAdeMO EVs either.

=>**THINK** : note that we will ship 300 EV in US and open a plant in US.

=>**ABB** : Ford has pure EV without quick charge. They would need it right?

Anegawa : theoretically this is right, but unfortunately CHAdeMO has no good contact with FORD who is sticking to PLC communication. One good US candidate to join CHAdeMO would be **TESLA**. They could be the first US OEM.

Presentation of EV manufacturers' sales plans

PSA Peugeot Citroën

By Igor Demay : Technical Coordination manager for EV program at PSA

- PSA has long been involved in EVs and was the biggest producer in the 90s.
- Our present EV portfolio includes Berlingo and Partner, two small commercial (or light duty) vehicles : at the beginning, they are using a new generation Nickel Salt battery, a battery that shall always remains "hot" : EV shall be either running or charging, which limits the applications to commercial fleets mainly.
- Next month on all European countries, PSA will be starting the sales of iOn and C-Zero, which is developed in collaboration with MMC (Mitsubishi Motors). On all European countries. We plan to sell several thousands units. These EVs will have the fast charge CHAdeMO, and AC normal charge mode 2. PSA prepares mode 3 for the future. ***This is not PSA target because :to be suppressed*** PSA thinks ***that, to introduce the EVs***, the mode 2 is more "user-friendly": it enables charging at home and PSA thinks it is a key point for the customers. PSA thinks the CHAdeMO quick charge is another key factor for the customers :
 - Psychological factor, driving without fear of being stuck several hours to recharge
 - Range extender, enabling to drive longer distances than usual

In France there will be a limited number of CHAdeMO quick chargers (the French policy for EV, the "livre vert", has included a few CHAdeMO DCQC).

PSA does not think to change the charging technology in the lifetime of an EV, that means CHAdeMO will be a **PSA (to suppress)** standard for the next 10-15 years **needed by the PSA customers**.

- Next generation Berlingo EV and Partner EV are developed in partnership with MMC and they will be using Li batteries with CHAdeMO quick charge. PSA thinks this is a very important function for the light duty vehicles that run many km during the day.

PSA will expand its EV offer **until 2021 (to suppress)**, and from 2015-2016 PSA will start to sale plug-in hybrids, which PSA believes will behave as EV during the week, and combustion engines in the week ends. PSA plans that these plug-in hybrids will be compatible with **CHAdeMO (to suppress)QC** (may be from the 2nd generation).

PSA will not offer the CHAdeMO quick charge as option, it will **mainly** be a standard on the EVs. We will concentrate both on markets with sensibility about ecology and clean electricity ; and on our core markets which are France, then UK, Spain, and **in future (to suppress)**Germany

NISSAN

by Olivier Paturet, General Manager Zero Emission Unit

Nissan Europe will launch the Leaf at first in Ireland, Portugal, UK, the city of Amsterdam (in 10 days). A second launch phase includes Scandinavian countries, Spain, France, then other area to be decided.

Our geographical sales strategy is based on local incentives, infrastructure, and the presence of electro-mobility operators.

From 2010 to 2013 the EV will be made in Japan. We will have 2 battery plants in Europe : UK and Portugal, and from 2013 the Leaf will be also produced in the UK.

Our next EVs are a Light Commercial Vehicle version and a luxury version using our Infinity brand.

We see 3 pillars for a successful infrastructure : presence of public infrastructure, domestic wall box, and CHAdeMO DCQC.

The wallbox won't be mandatory (except in some countries like Ireland). Nissan highly recommends it, since 16A charging on domestic plug is not possible without a wallbox. In the meantime, Nissan downgraded the cable to 10A. Nissan will start using the mode 3 with wallbox. Netherland and Ireland will use type 2.

Throughout 2011, 180 Nissan dealers have installed a DCQC in their dealership.

We still have a lot of homework :

- ➔ Cost down activities : DCQC cost was reduced by 50%. But remaining point is the installation (surface usage and installation cost)
- ➔ How to create revenue with the infrastructure (flat fee charging, parking cost etc) ? We shall work on business models to find how people can make money from the charge : if this does not generate profit, we think it will never sustain in the long term. Amsterdam has implemented free parkings and other incentives, some countries have decided to make the electricity free of charge at the beginning : this is a very good proposal to let users tests the products, until user may have to pay for a charge. When market is ready for the business case ?.
- ➔ A market for DCQC between 10-50kW? Semi-quick charge to reduce the infrastructure cost.
- ➔ Nbr of charger – max range capacity. We have monthly meeting with Navtec and need to report the DCQC location upon installation
- ➔ Customer acceptance and design of charger is another point to be continuously discussed with CHAdeMO.

Nissan Europe is now tackling small details to be ready in February (like mode 3 cable with CE marking).

Nissan Europe thinks the affordability of the EV is a key point to make it successfully adopted. If OEM want a fast payback period with expensive products, markets will be stopped by the price level.

Anegawa : in Japan Nissan worked with Sumitomo corp to set up a business case. BetterPlace Australia is working on installing CHAdeMO DCQC.

Mitsubishi Motors Corporation

by Mr. Takayuki YATABE

MMC's iMiEV was launched in July 2009 and we already produced 5000 units in Japan. From this month for Japan and a few left hand market we will deliver 10,000 units to Europe (until March 2011) From March 2011, we will produce 20,000 units per year including those for PSA.

US market : sales launch mid 2011.

We use a battery 16kWh which provides an autonomy of 150km (EU mode).

Sales are starting in 14 European countries (Austria to UK, so quantity allocated to each country is rather limited). Norway had a strong demand and booked 300 EV, available from December.

(**Anegawa** : at EVS25 in Shenzen, Norway announced it will try to install DCQC up to the north pole !!)

MMC website for iMiEV :

www.new-imiev.com

MMC will use AC mode 2 for EV shipped to Europe. Vehicule itself can accept AC mode 3. Some dealers will install DCQC but not all of them.

YAZAKI Status of supply of CE connector in Europe

Presentation by Mr.Kawamoto

(maybe you shall include it on CHAdeMO website for members)

Yazaki is one of the biggest independent companies in Japan.

Core product = wire harness since 70 years. Yazaki has a 30% market share in the world. 186 000 employees.

Other products non automotive. Air Con, Solar, Gaz equipement.

Yazaki DC connector history :

-1993 DC 600V 150A Japan

-2009 DC 600V 150A Japan

-2010 August 2010 DC 500V 120A and EU, US => Delivery start in Europe in Nov 2010.

-Terminals are fingerproof to avoid contact -40°C - 60°C range

-10,000 mating cycle

-Aluminium case was changed to plastic (for UL)

-Water tightness improved

-Reduced contamination

Yazaki European organization : Development in Ovar, Zagreb, Koln

Sales Windows :

Buss Development manager : Mr. Frank Ortmann

AC production will be localized in Portugal by end 2011 (Plant established in 1986)

DC production could also be localized in Portugal if market request

Leadtime : DC 6m 30 in stock

Yazaki needs forecast from customers 12 weeks in advance.

<http://charger.yazaki.group.com>

Jan 19-21 Automobile World exhibition in Tokyo.

CE marking with 120A :

Weight reduction is a major requirement for our connector and its cable. The connector itself weights only 2kg; most of the weight is in the cable, which is our target for weight reduction.

Since ISO cables have a range until 120A and another above 120A, we selected the ISO cable up to 120A in order to avoid bigger and heavier wires.

We shall mention reports on “unintended disconnection during the charge” : this occurred in laboratories and now under discussion. It was probably caused by an insufficient position of the lever then returning during the charge. We are working on countermeasures : 1) caution labeling or 2) add a lever support band.

CHAdEMO : The YAZAKI connectors have different European and US version : The color for powerline is different.

YAZAKI : CHAdEMO does not specify which circuit must be associated to which function. So the Japanese connector is different from the CE one. For instance, CE standard prohibit using red or orange color etc. If a competitor of YAZAKI starts to produce a connector, the colors will be different. It shall be monitored carefully.

YAZAKI : same background for AC connector occurred . The connectors from various suppliers are now interchangeable.

PSA : Well, not really : Mennekes type 2 and type3 have with minor differences and they don't match each other.

THINK : is it ok to ship out a connector purchased in Europe to Asia or the US ?

Certification Process for DC Quick Chargers

Anegawa : While I hear that CHAdEMO shall remain one organization worldwide, I also hear some members willing to create an European base for certification. What is your opinion ?

PSA : We certainly need a centralized organization, because if we create geographical CHAdEMO sub-organizations, CHAdEMO may well split into several standards !

Epyon : a certification institute would be necessary in Europe, like TNO Netherlands. It would also help small players to join CHAdEMO, like batteries manufacturers.

ENDESA : the involvement of a third party to perform the certification would bring cost reduction and experience.

AkerWade : we agree that an independent laboratory is necessary : in our case, scheduling the certification was the main issue.

EVtronic : schedule was an issue, but at the end the certification brings assurance that the product is ok. That's more important.

ABB : the certification test was easy and the bottle neck was the lack of resources at Tepco. A certification for EVs shall be evaluated if we want more EVs to enjoy the CHAdeMO quick charge.

Nissan is struggling to check compatibility of each DCQC in Europe. A cleaner process is necessary, and it could be handled by a third party.

CHAdeMO : The present certification process is not only a pure certification, but also a support to improve electric circuits proposed by DCQC manufacturers. This activity is time consuming for TEPCO and somewhat frustrating for CHAdeMO members. But TEPCO doing the certification is good as TEPCO waits for the problem to be fixed, whereas a third party would request candidates to come back again for a new certification test. Once the protocol specifications are perfectly finalized (version 1.0 or above), a third party could be appointed for certification.

CHAdeMO is preparing a test simulator that will be used for newcomers. It should be ready by the end of June. In this process, TUV or an European / US organization could be involved to provide this simulator for each regional certification.

Regarding EV certification, EV manufacturers don't like to be certified by TEPCO. TEPCO trust the majors OEM can achieve compatibility without problems, but smaller EV makers will need support. Fortunately MicroVett asked TEPCO support for certification, and this will be the starting point from TEPCO to be involved in EV certification.

TEPCO would certainly disclose the necessary information about the certification procedure, which is presently based on TEPCO's voluntary work. TEPCO would like to encourage the involvement of a 3rd party for the certification.

CERTIFICATION STATUS :

As of today, certified companies are **ABB, EVTRONIC, SGTE, EFACEC**

The procedure from joining CHAdeMO until being certified is the following :

1. DCQC manufacturer receives the protocol specifications
2. Q&A with CHAdeMO to correctly understand the specifications
3. Design and manufacture of the DCQC
4. Application to CHAdeMO for deciding the certification schedule
5. preliminary tests with CHAdeMO check list before certification
6. certification test with CHAdeMO engineers
7. upgrades and modifications if required
8. certification

In the future CHAdeMO intends to use a test bench, with no need for using an EV (Note: There might be much simpler test with vehicle as final check. Not sure at this stage). A prototype has been developed at TEPCO Japan (1mx1.55mH x 0.95m). The test bench integrates a measuring system, generating automatically graphic results enabling an easy judgment. DCQC's hardware and software

capacity can be checked automatically. Using the test bench, we target to perform the certification test within one day.

ONE : Is CHAdeMO involved in the commissioning of the DCQCs after installation, to guaranty they are compliant with CHAdeMO specifications ?

CHAdeMO being a nonprofit association, we have no money and would not be able to face any sort of court action against **CHAdeMO**. Each manufacturer shall be responsible to keep the compatibility of its DCQC after certification. The responsibility is in the hands of DCQC and EV manufacturers.

Schneider : how to make sure an EV is consistent with the test bench ?

CHAdeMO : after performing the certification with the test bench, we would anyway need a real EV for making the final certification. CHAdeMO plans to purchase one EV from MMC and NISSAN for the certification tests in Europe.

ABB : this money should be used to get a test bench in Europe rather than buying EVs, especially when the CHAdeMO protocol is updated, using a test bench is much more convenient.

PSA : As an OEM, PSA will need to check that the test bench is consistent with the EV. And we suggest to develop a charger simulator to certify the compatibility of future EVs.

EDP : we need a test bench for other reasons as well : 1) impact on the grids because doing it with EVs is too difficult and inconvenient and not automatic. 2) monitoring the condition of the power network. It would be good that DCQC manufacturers also make a simulator of their DCQC.

SGTE : Why do we presently have 2 tests : the certification test, plus additional test by EV manufacturer ?

Nissan : we believe the CHAdeMO certification is not enough, but we shall establish the trust in CHAdeMO. So Nissan makes its own test to avoid that a DCQC manufacturer would sell a defective DCQC. This would damage CHAdeMO reputation.

MMC : certification tests look like the minimum requirement. Sometime the DCQC itself is not reliable enough for being operated in real environment (heavy duty, extreme weather etc;). We had these problems in Japan. That is why, beside the CHAdeMO certification, we need to check DCQCs' performance with our EVs.

CHAdeMO : We design our simulator to be sufficient and avoid additional tests with EVs.

Note that these problems of additional tests would be even more necessary if CHAdeMO had selected PLC communication : PLC would be even more difficult to stabilize in a certification process.

Certification for EVs

ABB : US market has a lot of small niche OEMs, such as manufacturers of light duty commercial vehicles etc. We suggest that they could be a good step for CHAdeMO in the US, as their business case would get more value from using quick charging. But currently it is difficult for them to contact and join CHAdeMO.

Anegawa : CHAdEMO has no restriction regarding size of company. The main issue is the quality of the battery, since cheap and low quality battery could be a risk for quick charge. What about **MicroVett**.

MicroVett : Yes a cheap battery could be dangerous, and I suggest that CHAdEMO should welcome battery manufacturers as members of CHAdEMO, to let them sell not only the battery, but also the system including a BMS compatible with CHAdEMO DCQCs.

Anegawa : yes if entering small car OEMs in CHAdEMO, the battery safety could be an issue. As for battery manufacturers, Hitachi, Panasonic, etc are all CHAdEMO members, but no battery manufacturer overseas.

Nissan: why not establishing a certification for the EVs?

Anegawa : Bylaws have no requirement for EV manufacturers to undertake a certification and it could be amended.

SPECIFICATIONS CHAdEMO 1.0

CHAdEMO has set-up a task team: EV manufacturers, plus DCQC manufacturers : Takaoka, Hasetec, Takasago, Nittetsu and TEPCO. A draft of CHAdEMO 1.0 will be issued as soon as getting a consensus, probably within 2010.

Main improvements :

- EMC emission (pacemaker, RF distance, etc)
- Sequence circuit
- Overvoltage and lightning surge protection
- CAN bit sample point, difference between measured value (V, I) and value on CAN data (due to delay of data processing inside the charger)
- Timeout word : band-type time compliance -> point type time compliance
- Change error message CAN ID102.5.2. from "other EV fault" to "system error"
- Documentation : text, flow charge, data table;
- Shut down sequence Power outage ->inv off -> 12 power supply for EV relay off -> d1 d2 off

We need your feed back, as members, about possible improvements.

Epyon : will this request a new certification for the DCQC ? Will the cars be compatible with this new version ?

CHAdEMO : there will be no compatibility problem. Ex. EMC level : some Japanese equipment are above this level, but CHAdEMO will request EMC level especially for matching European requirement.

Epyon : how to handle feedback and version upgrade ?

CHAdEMO : this remains an issue, but probably in future if we take into account the request from German OEMs.

ENDESA : As a power utility company, we would like to add some functions. What are the limits of CHAdEMO protocol : where does the CHAdEMO ends ? where does the grid starts ?

PSA : how to make sure CHAdEMO is compatible with the power grids ?

CHAdeMO : We encourage utility companies to add requirement on top of CHADEMO certification like high harmonic, power factor correction, etc. At present there is no strict requirement in CHAdeMO specifications.

MicroVett :CHAdeMO 0.9 limits the power of DCQC to 50kW how will it evolve ?

CHAdeMO : this will change, but so far most DCQC cannot do better.

City of Amsterdam : from the user point of view, it is not easy to convince investor that DCQC has no influence on the battery lifetime. Can we get some objective/scientific information on that point ? MMC says that an IMIEV using only QC will be affected. We have been told that MMC recommended not to use DCQC more than once a day. This brings the question of what will happen if I quick charge my EV twice a day ?

CHAdeMO : there is no negative impact by fast charging for good batteries.

Battery improvement is very rapid. Next or following year, MMC (now 30min for charge) will propose the quick charge within 15min. So DCQC investment is not a waste. We have all been surprised to hear Nissan North America saying that too many quick charges were harmful for the Leaf and they should correct this statement. Scientific demonstration should be organized.

Inovos : We should add a page on the CHAdeMO website to educate potential DCQC operators about the effect of QC on the battery life.

CHAdeMO Europe

Anegawa : what is your opinion about CHAdeMO Europe ?

Think : CHADEMO need a central organization with a steering committee for Europe and another one for the USA with a yearly meeting at least. It would need promotional activities, and increasing the number of members would show how CHAdeMO is opened. The connector interface should become an open data to let newcomers in. The protocol should become open source so that each country could add additional features like connection / communication to the powergrid.

ENDESA : We need a European group to bring recommendations to CENELEC and standardization advices.

Epyon: We need a task force that makes proposal regularly and tackles all key issues for Europe.

Nissan : CHAdeMO shall set up conferences at European each motor show, plus regular meetings like this one.

Epyon : We need the support from power utility companies. This would help to avoid the present political and standard competition. Power utility companies look more neutral.

Endesa : We can help, but CHAdeMO also need a committee gathering not only utility companies, but also OEMs, Infrastructure providers etc

CHAdeMO : we will set up a steering committee, including **Nissan, MMC and PSA**.

It is not possible to have meetings dedicated to infrastructure because each manufacturer is a competitor and do not speak to each other without TEPCO presence.

ENDESA is very neutral and easy to talk to, but some utility companies are ego centric.

ENDESA, PSA could become head of steering committee.

ESB agree to participate to this committee

EPYON is candidate as well

ABB also, as equipment management perspective. We would need an utility company operating on a European scale, like **Vattenfal**, for example.

NISSAN encourages the European **CHAdEMO** to have a mandate to communicate to investors, cities, etc... because up to now we are just talking to ourselves.

RUEBEN POWER is candidate as well.

Communication could be supported by **Inovos** and **Protoscar**.

Steering committee : shall be aimed to influence governmental organizations.

AMSTERDAM City : don't forget to orientate the website and your communication to the users, and not only focus on technical items.

END OF MEETING

Next CHAdEMO Europe meeting will probably be held at the Geneva Motor Show.

The 2nd general assembly of CHAdEMO will take place on April 26-27 in Japan