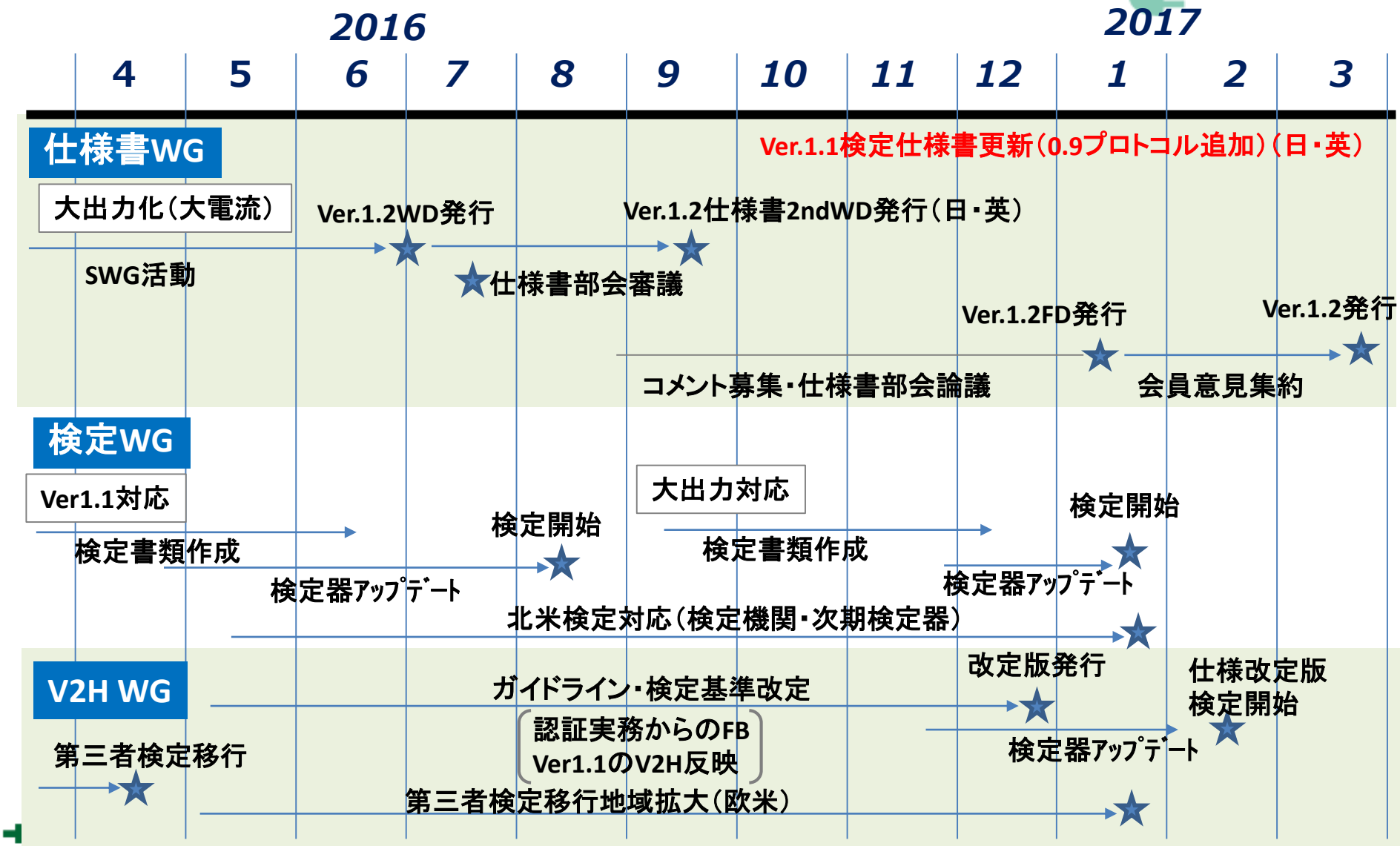
CHAdeMO
整備部会

2016上半期
Technical Committee Report

DEC 09, 2016

CHAdeMO association
TC Chair Tomoya Imazu

2016年度　技術部会活動計画



FY16 CHAdeMO Technical Committee report [1/2]

Specification WG 仕様書WG

- High power is the main issue
  - Phase 1: high current up to 400A
  - Phase 2: high voltage up to 1kV
- CHAdeMO standard spec. v1.2 for phase 1
  - FD soon for commenting
- Additional design guideline v0.1
- Protocol check sheet

- Future works
  - High voltage specification detail for phase 2

FY16 CHAdeMO Technical Committee report [1/2]

Certification WG 検定WG

- Tester Modification from 1.0 to 1.1. Ready for start of 1.1 certification in Japan, soon in Europe
- Global certification establishment investigated

- Future works
  - Synchronization of certification procedure between chargers and V2X-devices
  - Vehicle certification investigation
  - 1.0- and 1.1-certification scheduled
  - Digging/expanding 1.1 certification opportunity abroad

FY16 CHAdeMO Technical Committee report [2/2]

V2H WG

- 3rd party certification started
- Virtual Power Plant preparation
  - Various VPP projects under investigation with ECHONET consortium, EVPOSSA, JEMA, JAMA. No major change for far
  - Optional Contract ID going to be added
- [info.] IEC TC69 plenary in last OCT in Frankfurt
  - TC57, Germany, France, Italy proposed smart-grid communication for V2HG, Japan and China(?) join
  - CHAdeMO communication already referred in TC57 IEC61850-90-8 ed1 > revision

FY16 CHAdeMO Technical Committee report [2/2]

- [info.] IEC topics
  - TC69 MT5 IEC61851-23, 24 ed2 CD circulated to National Committees
    - CHAdeMO bi-directional in it
    - CHAdeMO high power defined in v1.2 in it
  - TC57 WG17 IEC61850-90-8
    - Ed2 started with multiple smart-grid communication standards(?)
    - Not only this WG but other WGs are to be integrated as joint activities (see previous TC69 plenary)

欧州チャデモ出張：　技術部会報告

■ 欧州チャデモTWG開催(2016.10.19)，今津･大出力化SWG上島

- 技術部会活動の報告
- 大出力･マルチなどv1.2の改定ポイントを説明
- スマグリ向けVINの在り方を議論
  - CCSと同じく”contract ID”を定義導入する
  - 各地域での詳細定義を進める

■ eCarTec/eMOVE360概観

- 2016.10.18-22 at Munich, Germany
- 試作･市販併せて展示充電器の90%がDUAL
- 100kW超え大出力DC充電器が５機種（４機種DUAL）

CHAdeMO

eCarTec展示

■CHAdeMOブース

車両：日産 LEAF　充電器：SIGNET, DBT　充電コネクタ：フジクラ, JAE　V2G：ENEL

eCarTec展示

■ 高出力充電器

SIGNET(100kW)

DBT(150kW)

Efacec(150kW)
※CCSのみ
コネクタ：Phoenix Contact
（200A）

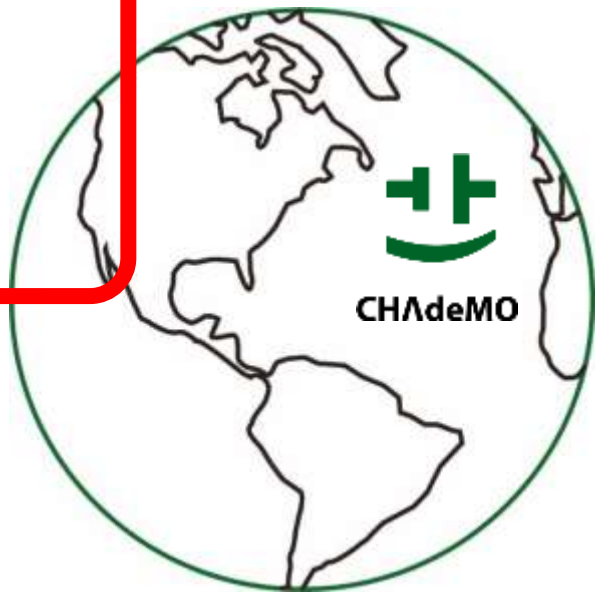
ABB(350kW)
※CCSのみ
液冷コネクタ：ITT Cannon
液冷ケーブル：Huber+Suhner

DELTA(150kW)

TECHNICAL WG
ver 1.2
Tech. Summary

Revised items

- CHAdeMO 1.2 High Power Charging Specification
  - Summary
  - Current ratings
  - Over-temperature protection
  - Available options for charger manufacturers
  - Additional CAN messages
  - Conformity with IEC
- CHAdeMO 1.2 Multi-outlet Specification
  - Summary
  - Construction and safety requirements
  - Available options for charger manufacturers
  - Conformity with IEC



CHAdeMO 1.2 High Power Charging Specification

Summary

Functional and safety requirements for high-power chargers (> 200A) have been newly defined

- ✓ Variety of design options available for charger manufacturers
- ✓ Standard operating condition - now up to 200A (instead of 125A)
- ✓ Additional requirements for over-temperature protection of charging connector and cable
- ✓ **Newly defined extended CAN specification for high-current control above 200A**
- ✓ Conformity with the requirements in IEC 61851-23 Ed.2 (CD)

Source: http://insideevs.com/kia-installs-first-100-kw-chademo-dc-fast-chargers-europe/

Source: http://arcticroads.com/nyheter/opens-120-kw-ev-charger-to-the-public/

CHAdeMO 1.2 High Power Charging Specification

Current ratings

Maximum current is 200A for standard and 400A for specific operating condition

No	Operating condition	Maximum current	Remarks
1	Standard operating condition	Less than or equal to 125A	Corresponds to Case A in Table 7.2(b)
2	Standard operating condition	More than 125A and less than or equal to 200A[3]	Corresponds to Case B in Table 7.2(b) High current control of clause 3.2 in Part 2 is not applied.
3	Specific operating condition	More than 125A and less than or equal to 200A[4]	High current control of clause 3.2 in Part 2 is applied.
4	Specific operating condition	More than 200A and less than or equal to 400A[4]	High current control of clause 3.2 in Part 2 is applied.

CHAdeMO 1.2 High Power Charging Specification

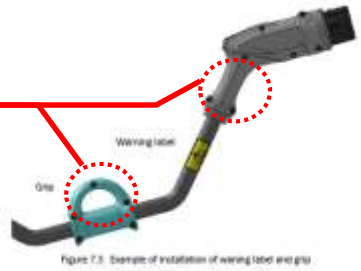
Over-temperature protection

Criteria for the protection against over-temperature of connector and cable:

(a) Surface temperature of the charging cable

The surface temperature of the charging cable shall comply w following requirements under the normal operating temperatu

- **The graspable part shall not exceed 60°C**
- **The touchable part shall not exceed 85°C**



(b) Temperature of the terminals of the charging connector

The temperature of the terminals of the charging connector shall comply with all of the following requirements under the normal operating temperature (40°C)

- **ΔT at the terminals shall be less than or equal to 50K**
- **The temperature of the terminals shall not exceed 90°C**

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Over-temperature protection

Key points:

- Monitoring and control of inlet temperature by vehicle are not mandatory
- Warning label and grip for the connector/cable are to be provided by connector manufacturer
- Connector/cable without active-cooling can be used for high-power charging, as long as the temperature requirement is satisfied

CHAdeMO 1.2 High Power Charging Specification

Available options for charger manufacturers

Key point: charger manufacturer can implement a function that is reliant on either hardware, software or both, considering the balance between cost and performance

HARDWARE reliant ⟷ **SOFTWARE** reliant

Large cable-diameter

Fuse inside connector

Actively-cooled connector and cable

Functional safety

Temperature monitoring and control

Revised items

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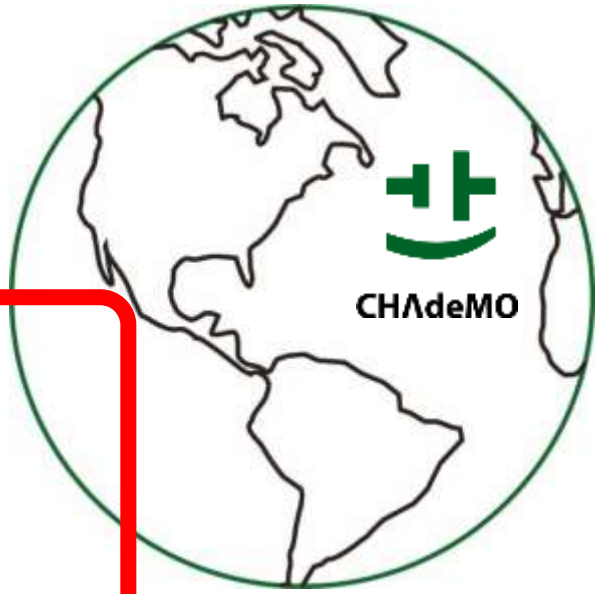


CHAdeMO 1.2 Multi-outlet Specification

summary

Constructional and safety requirements for multi-outlet chargers (with at least one CHAdeMO connector) have been newly defined

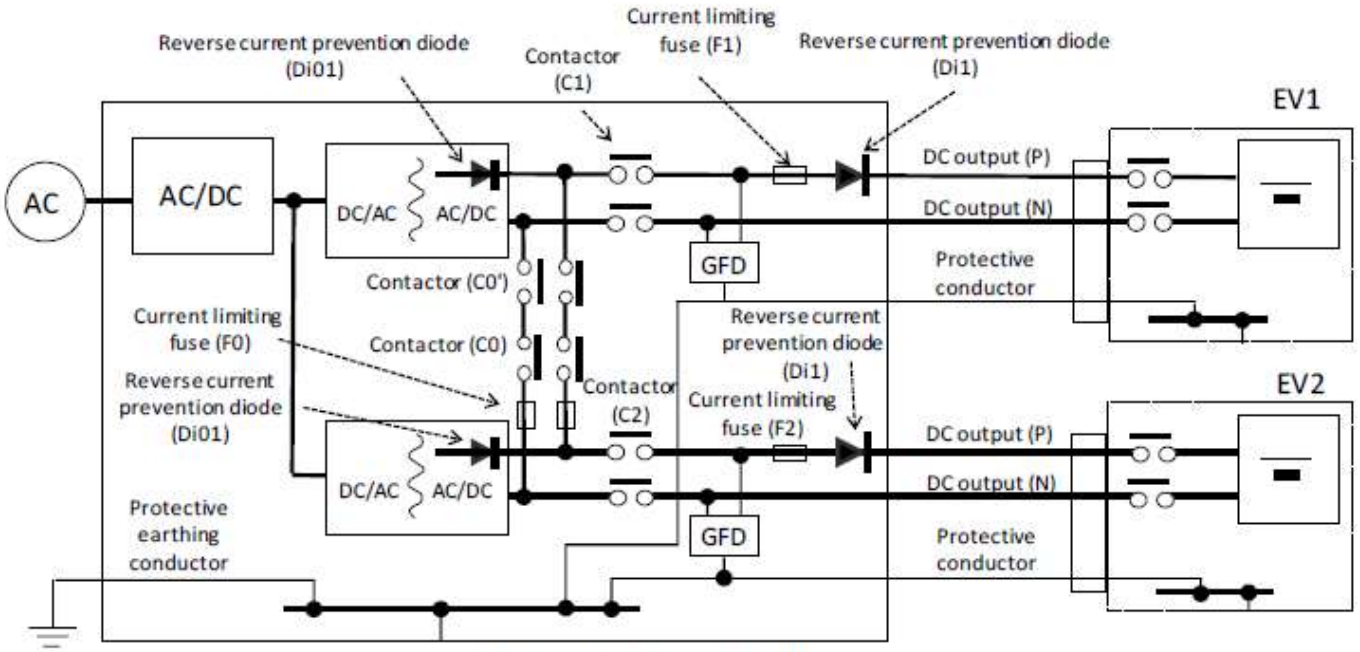
- ✓ Variety of design options available for charger manufacturers
- ✓ Allows simultaneous charging of two or more vehicles by a multi-outlet charger
- ✓ Conformity with the requirements in IEC 61851-23 Ed.2 (CD)

Source: http://www.greencarreports.com/news/1101527_nissan-bmw-partner-to-provide-more-fast-charging-for-electric-cars

CHAdeMO 1.2 Multi-outlet Specification

Construction and safety requirements

Representative diagram:

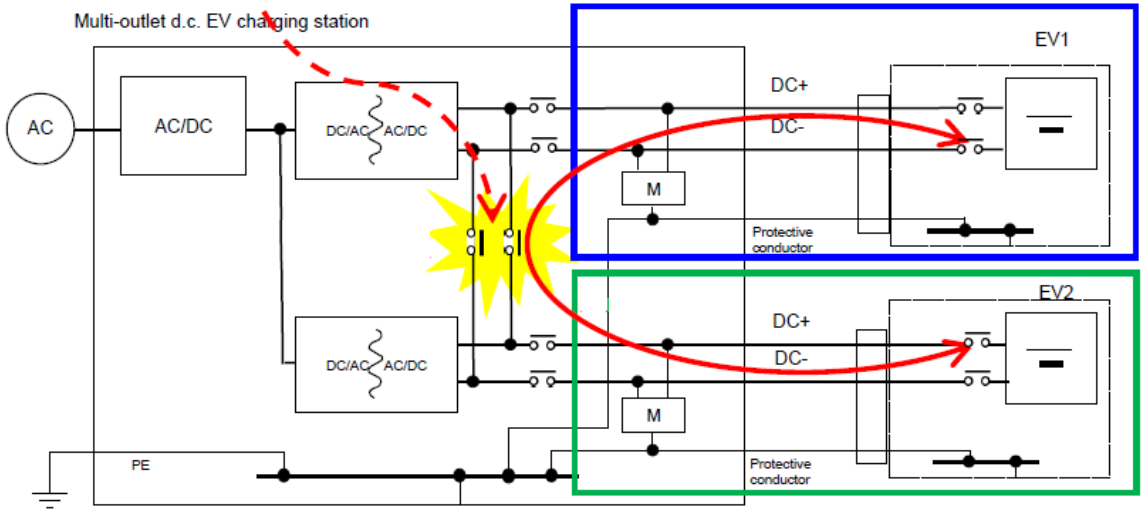


Appended figure 5.3.1 Typical circuit configuration

CHAdeMO 1.2 Multi-outlet Specification

Construction and safety requirements

Key point: a short circuit caused by single failure (e.g. welding of contactors) at the connecting part between two or more vehicles mated to a multi-outlet charger is prevented by hardware and/or software redundancy



Such a short-circuit, which could damage both the vehicles and the charger, must be avoided at all costs

CHAdeMO 1.2 High Power Charging Specification

Available options for charger manufacturers

Key point: charger manufacturer can implement a redundant function that is reliant on either hardware, software or both, considering the balance between cost and performance

HARDWARE reliant

Reverse-flow protection diode

Fuse

Redundant disconnecting device

Interlock

SOFTWARE reliant

Functional safety

Diagnostic check of disconnecting device

All you need is. CHAdeMO !