中国电力企业联合会 CHINA ELECTRICITY COUNCIL

中日ChaoJi充电接口项目进展
Progress of Sino-Japan Chaoji Charging Project

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History of the Project 中日ChaoJi项目历程

中国电力企业联合会
CHINA ELECTRICITY COUNCIL

1 2018.8.28,Beijing,CEC & CHAdeMO Signed MOC
@中国北京，CEC & CHAdeMO签署协议

2 2018.10.29-30, Tokyo，Japan 1st Sino-Japanese JWG
@日本东京，首次中日联合工作组会议

3 2019.3.5-6，Changzhou，China 2nd Sino-Japanese JWG meeting
@中国常州，第2次中日联合工作组会议

4 2019.7.18-21，Japan ,3rd Sino-Japanese JWG meeting & 1st International ChaoJi JWG
@日本，第3次中日联合工作组会议&国际工作组成立

5 2020.3.3，web meeting,4th Sino-Japanese JWG web meeting
第4次中日联合工作组网络会议

★ **2020.06, China&Japan Release ChaoJi White Paper & CHAdeMO 3.0,**中国&日本发布 ChaoJi 白皮书& CHAdeMO 3.0

6 2020.9.24-25，web meeting , 5th Sino-Japanese JWG meeting
第5次中日联合工作组网络会议

7 2021.3.29，web meeting , 6th Sino-Japanese JWG meeting
第6次中日联合工作组网络会议

Members of the Project 项目成员

中国电力企业联合会
CHINA ELECTRICITY COUNCIL

Progress 项目进展

SWG1-Coupler连接器

Identified已确定

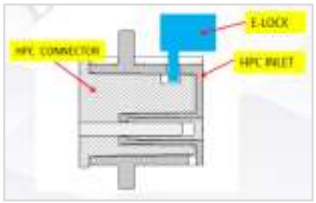
- Basic Parameters 基本参数
- Mating face 接口
- Water Penetration 防进水设计
- Mechanical Strength 机械强度

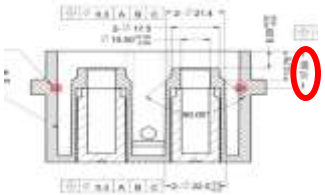
Basically defined基本确定

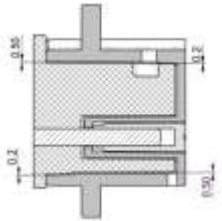
- Tolerance Analysis 公差分析
- Hardware Coding 硬件编码
- PE Conductor cross section
  PE导体界面

Under discussion讨论中

- Adapter 适配器
- Ultra High power 超大功率接口







适配器

超大功率接口
尺寸:67x71.5mm

超大功率接口
尺寸：68x72.5mm
超大功率接口和
ChaoJi接口通用

Progress 项目进展

SWG1-Coupler连接器

✓ Drop Test 跌落测试 (after 80 drops)

ChaoJi

2.0m

1.8m

Slight deformation 轻微变形

VS

CHAdeMO

housing cracked 壳体开裂

✓ Impact – ball test 冲击测试 (falling height：1.02m, ball：1042g，10.4J)

ChaoJi

No cracking 没有开裂

VS

GB/T 2015

Cracking 开裂

SWG1-Coupler连接器

✓ **Run Over Ability Test 碾压试验（wheel load of 5380N，speed of (8±2)km/h)**

ChaoJi

没有开裂

VS

CHAdeMO

信号空轻微变形

CCS

没有开裂

✓ **Crushing Test 压溃试验（Forward Crushing/ Lateral Crushing/Single Point Crushing ）**

ChaoJi

8.1kN~8.5kN　6.6kN　2.51kN

VS

CHAdeMO

4.8N　2.4kN

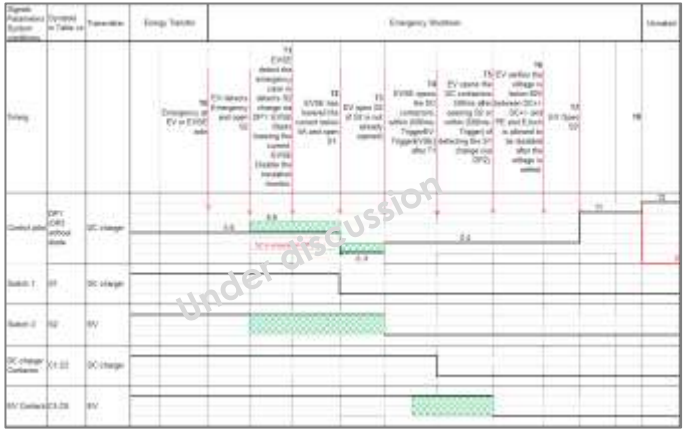
CCS

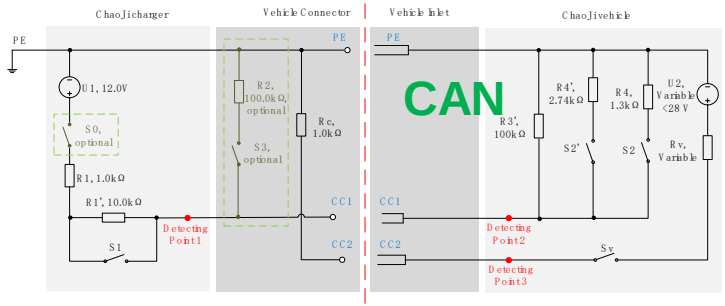
1.2kN~1.5kN　1.7kN~1.8kN　1.1kN

Progress 项目进展

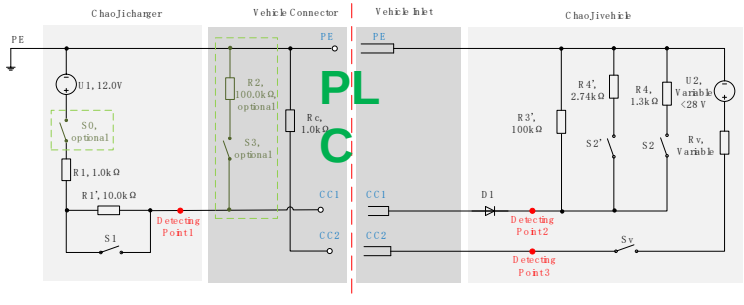
SWG2-System safety系统安全

- New Control Pilot Circuit 新的导引电路
- Charging and Control sequence 充电控制时序
- Pre-Charge 预充
- Shutdown 停机
- Inrush current 冲击电流
- Overvoltage 过压
- Touch current 接触电流





* 2020.9 edition-V3.33

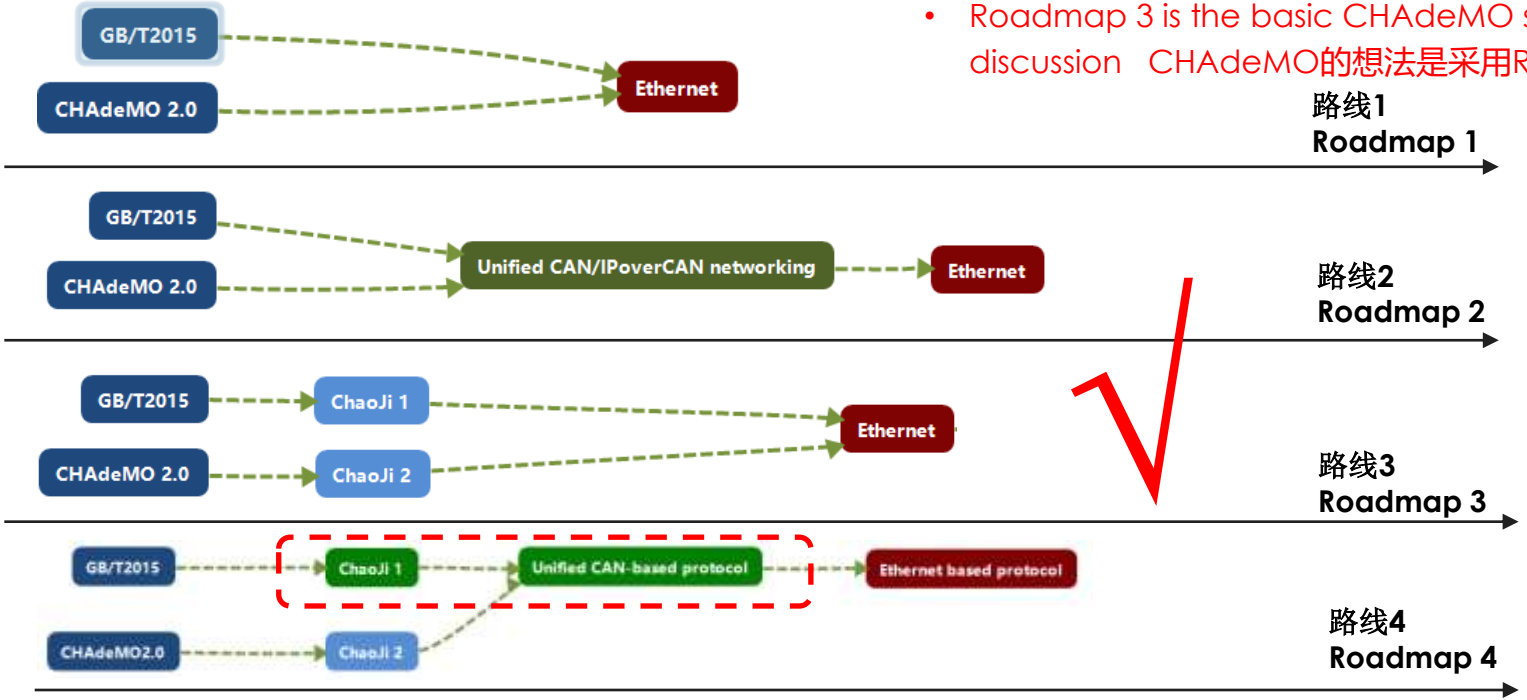


* 2020.9 edition-V3.34

Progress 项目进展

SWG3-Communication Protocol通信协议

- Roadmap 2 is to be recommended
  建议ChaoJi1 和ChaoJi2 采用Roadmap 2
- Roadmap 3 is the basic CHAdeMO stance after discussion CHAdeMO的想法是采用Roadmap 3



ChaoJi1 and ChaoJi2发展路线图

Progress 项目进展

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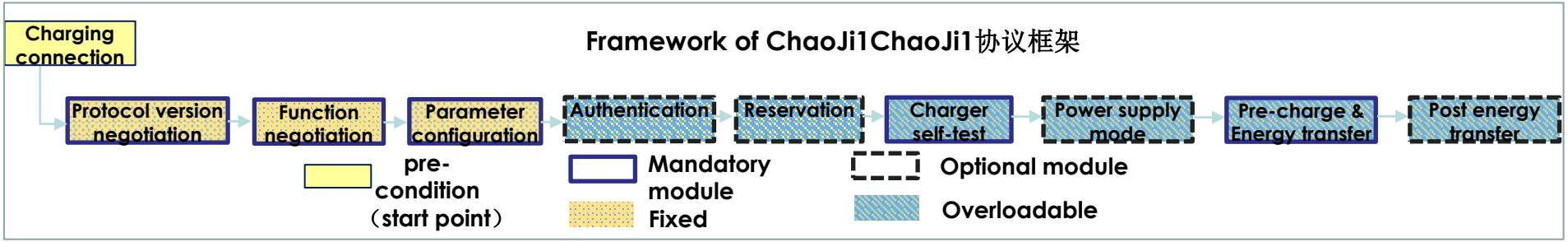
SWG3-Communication Protocol通信协议



Protocol switching协议切换

- Solution1：dual-protocol charger，baud rate detection
  方案1：充电机采用双协议，使用相应的传输速率和帧格式来试探车辆的协议类型，并进行切换。
- Solution2：public part with same baud rate and frame format to exchange version information
  方案 2：定义一个公共的部分（相同的传输速率，帧格式）来完成协议类型的交互，切换至协商后的协议类型.

Experimental verification of protocol switching schemes is in progress

协议切换方案的试验验证正在进行中

Preliminary Plan初步计划

By 2021, SGCC will deploy **6** high power charging stations with ChaoJi interface along the G1(Beijing to Shanghai) Highway. The plan is **2** city charging stations in Beijing and Shanghai, **4** highway stations in Tianjin, Hebei, Shandong and Jiangsu province.

2021年，国家电网公司将在G1(北京到上海)公路沿线部署6座具有ChaoJi接口的大功率充电站。计划在北京和上海设立2个城市充电站，在天津、河北、山东和江苏设立4个高速公路充电站。

Structure Type	Split type
Total Power	360kW/480kW
Charging Interface	4-8 NPC(GB/T 20234.3), 1 HPC(ChaoJi)
NPC Interface Parameters	DC 200-1000V，DC 250A
HPC Interface Parameters	DC 200-1000V，DC 500A
Constant power voltage range	DC 300-1000V
Charging Module	30kW
Access to the platform method	TCU/SDK

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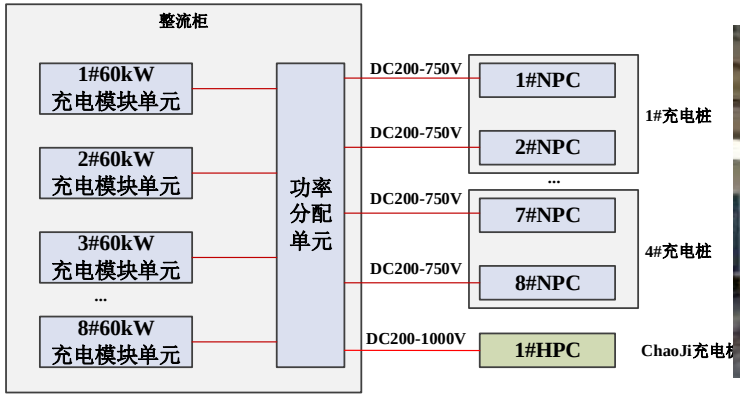
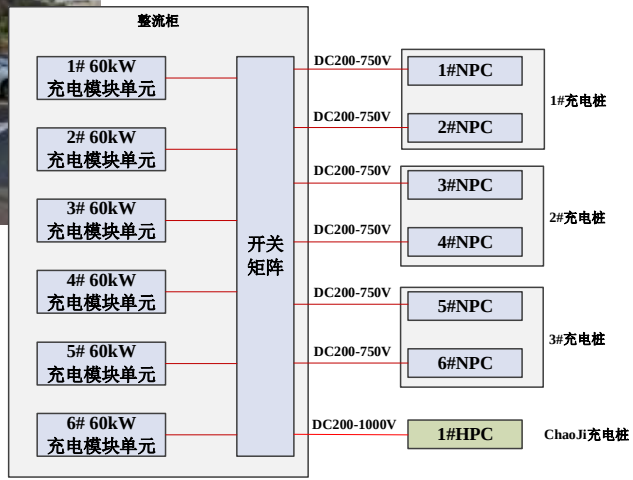
国家电网公司
STATE GRID
CORPORATION OF CHINA

Charging Station Renovation 充电站改造



Highway Fast Charging Station
高速快充站



City Public Fast Charging Station
城市公共快充站

ChaoJi Charging Demonstration Project ChaoJi充电示范站

电动汽车柔性充电堆
Flexible charging pile for EV

电动汽车大功率充电终端
ChaoJi Charging Terminal

奥特迅计划2021年在深圳建成10座超级充电站，并与车企开展ChaoJi充电示范
ATC plans to build 10 ChaoJi charging stations in Shenzhen by 2021 and conduct ChaoJi charging demonstrations with EV companies

ChaoJi Charging Demonstration Project ChaoJi充电示范站

星星充电
Star Charge

◆500kW大功率液冷充电系统—常州总部示范站
500kW High-power charging station with liquid cooling system-Demonstration Station in Headquarter, Changzhou

◆240kW大功率液冷一体机—长春示范站（建设中）
240kW high-power charger with liquid cooling system-Changchun Demonstration (under construction)

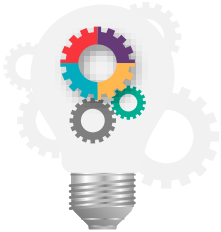
Standardization标准化

Domestic国内

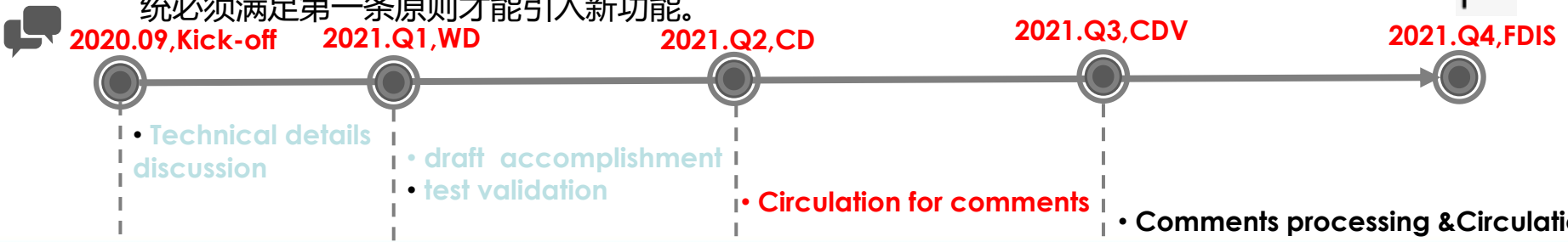
Revision of the 2015 version of the standard on the premise that safety and forward/backward compatibility are not violated.
GB/T2015 版修订：保证其安全性、向前/向后兼容性

The new ChaoJi system requirements and communication protocols will be published as part of GB/T 18487.1 and GB/T 27930 alongside the previous 2015 version of the interface. ChaoJi系统要求及通信协议：作为GB/T 18487.1 、 GB/T 27930 的一部分，与GB/T2015系统修订部分一起发布

New features such as plug-and-charge, V2X, and high power/voltage charging etc,. will gradually be defined in the ChaoJi system, while the 2015 version system must meet the first principle before new features can be introduced.
ChaoJi系统中将逐步定义新功能，如PnC，V2X，和大功率/高电压等，GB/T2015版系统必须满足第一条原则才能引入新功能。



Revision Principle



Standardization标准化

International Electrotechnical Commission

TC69 MT5

- Due to the current stage of 61851-23 ED2, it is agreed to adopt ChaoJi as system D in next edition 鉴于61851-23 ED2的现阶段情况，工作组同意在下一版中将ChaoJi系统作为附录D写入标准中
- Has revised clause 10 and open the door for adopting vehicle adapter 工作组已修改第10章（适配器），为采用车辆适配器提供了可能

SC23H

- China and Japan jointly propose a new standard for vehicle adapter 中日正在联合提出车辆适配器提案

Cooperation Suggestions 合作建议

Proposal to Sino-Japan standardization collaboration

- It is hoped that CN and JP will continue to strengthen cooperation on the existing basis and jointly promote the research, development and demonstration work of the ChaoJi project
  希望中日在现有基础上继续加强合作，共同推动ChaoJi项目的研发和示范工作
- In national and international standardization, together with China and other international parties to promote ChaoJi technology and lay the foundation for a future universal harmonized charging interface
  在国内及国际标准化方面，与中国及国际其他各方共同推广ChaoJi技术，为未来统一协调充电接口奠定基础
- Together to set up a joint working group between TC69 and SC23H to deal with the safety and compatibility for different conductive charging system
  共同成立TC69和SC23H联合工作组，处理不同导电充电系统的安全性和兼容性问题

Thank you!