Rationale with respect to protection during AC and DC charging and feeding process

In GTR 20 Phase 1, it was concluded that additional discussions were required on some critical issues, where research and testing of methods was still in progress or needed to be verified by Contracting Parties. One of these topics was a potential protection during AC and DC charging and feeding process.

However, since then no field evidence has come up that would justify such an additional requirement. The reported number of electric vehicle fires in the field remains rather scarce despite its strongly growing presence in the different markets worldwide.

In principle, the AC and DC charging and feeding process requires the coordination and collaboration of different industries, e.g. automobile, electrical equipment, etc., through a wide range of different technical standards by international or national standardization organizations like ISO, SAE, IEC, SAC(China) etc. [cf. e.g. 1-11]. Accordingly, the compliance with the relevant technical standards in each region is essential to ensure inter-operability, co-existence as well as safety. These standards are under constant revision to account for the rapid development of technology and new challenges that might arise therefrom. Almost a decade of significant market penetration of electric vehicles has shown that these standardization activities are able to set a reasonable amount of safety in the world and there is no evidence that this is in danger since standardization activities are usually undertaken by a large consortium including vehicle manufacturers, battery manufacturers, charging equipment manufacturers, infrastructure providers and others.

Thus, a mandatory requirement only for vehicles for protection during AC and DC charging and feeding would be a regulatory burden for electric vehicles without bringing any safety benefit for the costumers. Furthermore, it could be detrimental for future technologies because it could freeze the protective measures to a certain state of the art.

[1] ISO 17409:2015: Electrically propelled road vehicles – Conductive power transfer – Safety requirements

[2] IEC 61851-1:2017: Electric vehicle conductive charging system - Part 1: General requirements

[3] IEC 61851-23:2014: Electric vehicles conductive charging system - Part 23: DC electric vehicle charging station

[4] IEC 62196-1:2014: Plugs, socket-outlets, vehicle connectors and vehicle inlets - Conductive charging of electric vehicles - Part 1: General requirements

[5] IEC 62196-2:2011: Plugs, socket-outlets, vehicle connectors and vehicle inlets - Conductive charging of electric vehicles - Part 2: Dimensional compatibility and interchangeability requirements for a.c. pin and contact-tube accessories

[6] IEC 62196-3:2014: Plugs, socket-outlets, and vehicle couplers - conductive charging of electric vehicles - Part 3: Dimensional compatibility and interchangeability requirements for dedicated d.c. and combined a.c./d.c. pin and contact-tube vehicle couplers

[7] GB/T 18487.1-2015: Electric vehicle conductive charging system -- Part 1: General

requirements
[8] GB/T20234.1-2015: Connection set of conductive charging for electric vehicles — Part 1: General requirements
[9] GB/T20234.2-2015: Connection set of conductive charging for electric vehicles — Part 2: AC charging coupler
[10] GB/T20234.3-2015: Connection set of conductive charging for electric vehicles — Part 3: DC charging coupler
[11] SAE J 1772-2017: Electric Vehicle and Plug in Hybrid Electric Vehicle Conductive Charge Coupler