OFFICE MEMORANDUM

SUBJECT: MINUTES OF MEETING FOR STANDARDIZATION OF PROTOCOL OF AC & DC CHARGERS FOR ELECTRIC MOBILITY – FORWARDING OF MINUTES - REGARDING.

The undersigned is directed to forward minutes of the meeting held at 5.30 PM on 26th February 2018 at Udyog Bhawan under the chairmanship of Secretary (Heavy Industry) to decide issues pertaining to standardization of protocol of AC & DC chargers for electric mobility

2. This has approval of the competent authority.

Encl: As Above.

(Ajay Kumar Gaur)
Under Secretary to the Govt. of India
Tel.No. 23061340
Email: ak.gaur@nic.in

To

1. Shri Pankaj Batra, Member (Planning), CEA, New Delhi.
2. Dr. Surina Rajan, DG, BIS, New Delhi.
3. Smt. Rashmi Urdhwareshe, Director, ARAI, Pune.
4. Dr. Sajid Mubashir, Scientist G, D/o Science & Technology, New Delhi
5. Shri Anand Deshpande, Dy. Director, ARAI, Pune.
7. Shri P.V.Mathew, BIS, New Delhi.

Copy to:-

1. Pr.SO to SHI.
2. PPS to JS (Auto), DHI.
3. Director (Auto), DHI.
4. Sr.DO (NLG), DHI.
MINUTES OF MEETING FOR STANDARDIZATION OF PROTOCOL OF AC & DC CHARGERS FOR ELECTRIC MOBILITY

A meeting was held on the subject of standardization of protocol for AC and DC chargers in New Delhi on 26th Feb 2018 under the Chairmanship of Secretary (Ministry of Heavy Industries and Public Enterprises). The list of attendees is attached as Annexure-I.

1. Chairman gave brief background of the subject and requested members to give their valuable inputs in order to arrive at consensus regarding EV charging standardization and protocol. This would facilitate further discussion at NITI Aayog and help in formulating policy of EV charging infrastructure.

2. Director-ARAI presented recommendations of:-
   2.1. Earlier Committee which developed provisions for low power AC & DC charging stations (for EVs having system voltage less than 100 VDC)
   2.2. The Committee chaired by Director-ARAI for high power AC & DC charging stations (for EVs having system voltage greater than 100 VDC). The summary of recommendations presented during the meeting is attached as Annexure II.

3. The members deliberated on the specific recommendations and agreed for following action plan:-
   3.1. AC low power slow charging (2 W, 3 W and small 4 wheelers) present recommendation (as per BEVC-AC001) is to use IEC 60309 connector (Industrial power plug / socket). It does not have provisions for EV-charger communication.

   Shri Pankaj Batra, Member (Planning), CEA was of the opinion that for effective grid side demand management as well as operational safety, data communication between EV and charger would be essential. After discussions, it was agreed that –

   ARAI in consultation with vehicle manufacturers will evolve requisite specifications for 2 & 3 wheelers as per following timeline:
   a. Within 3 months: Technical proposal by ARAI
   b. Within 6 months: Voluntary implementation by 2 and 3 W manufacturers
   c. Within 2 years: Mandatory implementation by 2 and 3 W manufacturers

   DHI will notify these timeline in the notification to be issued for charging Standards.

Contd./-
3.2. Small 4W vehicles (less than 100V) will have Type 2 coupler (IEC 62196-2).

3.3. For DC fast charging (low power) recommendation for 4W vehicles (having system voltage < 100 VDC), modified GB/T protocol based on IEC 61851-24 System B has been suggested. Members agreed with the recommendation.

3.4. Committee chaired by Director-ARAI has recommended Type 2 (IEC 62196-2) as connector standard for high power AC charging. Members agreed with the recommendation.

3.5. Committee chaired by Director-ARAI has recommended CCS-2 (Combined Charging System) as per IEC 62196-3 as connector standard for high power DC charging. This connector provides single coupler on vehicle inlet side for either AC or DC charging for the vehicle. Members agreed with the recommendation.

3.6. It was agreed that CCS-2 would be the mandatory requirement for DC fast charging at public charging stations. Additionally other options (such as Chademo, GB/T as per IEC 61851-23 and IEC 61851-24) may also be provided as option to encourage inclusiveness. For private infrastructure any of the above 3 options could be deployed.

4. Having recognized the work done so far under AISC/ CMVR-TSC and the DHI committees, BIS agreed to formulate national standards at the earliest. Based on AIS 138 – Part 1 and AIS 138 – Part 2 as well as India’s specific requirements like environmental conditions, BIS would formulate Indian national standards (IS) based on IEC 61851 series of standards within 3 months.

AIS documents along with exception report with respect to IEC standard is already available with ARAI and the same would be shared with BIS within 1 week for taking it further for IS development.

5. It was also agreed that in future work related to charging standardization, BIS and CEA would be involved.

6. For domestic charging connections suitable guidelines based on above discussions would be evolved by CEA.

7. For 2, 3-wheeler industry there would be an additional cost implication on account of communication protocol. Suitable policy measures may be initiated at appropriate level.

The meeting ended with a Vote of Thanks to the Chair.

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List of Participants

(Meeting to discuss issues related to standardisation of protocol of AC & DC Chargers for electric mobility)

1. Dr. Asha Ram Sihag, Secretary (HI) - In Chair
2. Shri Vishvajit Sahay, Joint Secretary (Auto)
3. Mrs. Rashmi Urdhwareshe, Director, ARAI
4. Shri Pankaj Batra, Member (Planning), Central Electricity Authority
5. Smt. Surina Rajan, Director General, Bureau of Indian Standards
6. Dr. Sajid Mubashir, Scientist G, D/o Science & Technology, New Delhi
7. Shri Rajeev Sharma, Bureau of Indian Standards
8. Shri P. V. Mathew, Bureau of Indian Standards
9. Shri Anand Deshpande, ARAI
10. Shri Pravin Agrawal, Director (DHI)
11. Shri N.L. Goswami, Sr. Development Officer (DHI)
12. Shri Ajay Kumar Gaur, Under Secretary (DHI)
## RECOMMENDATIONS FOR ELECTRIC VEHICLE CHARGING CONNECTOR, PROTOCOL STANDARDISATION

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Charging Type</th>
<th>Communication Protocol Type &amp; Standard</th>
<th>Charging Connector Standard</th>
<th>Electric Vehicle Inlet</th>
<th>Charging Station Safety Standard</th>
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</thead>
<tbody>
<tr>
<td>1.</td>
<td>AC Low Power</td>
<td>NA</td>
<td>IEC 60309</td>
<td></td>
<td>AIS 138 (Part 1)</td>
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<tr>
<td></td>
<td>Slow Charging</td>
<td>NA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Mains 230 VAC, 15 A, 3.3 kW)</td>
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<td></td>
<td>BEVC AC-001</td>
<td>CAN</td>
<td>IEC 61851-24 System B</td>
<td>GB/T 20234.3</td>
<td>AIS 138 (Part 2) / IEC 61851-23</td>
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<td>2.</td>
<td>DC Low Power</td>
<td>CAN</td>
<td>IEC 61851-24 System B</td>
<td>GB/T 20234.3</td>
<td>AIS 138 (Part 2) / IEC 61851-23</td>
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<td></td>
<td>Fast Charging</td>
<td>(48/72 VDC, 200 A, 10/15 kW)</td>
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<td></td>
<td>BEVC DC-001</td>
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<tr>
<td>3.</td>
<td>AC High Power</td>
<td>Yes</td>
<td>IEC 62196-2 Type 2</td>
<td></td>
<td>AIS 138 (Part 1) / IEC 61851-22</td>
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<tr>
<td></td>
<td>Fast Charging</td>
<td>(up to 43 kW)</td>
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<td>4.</td>
<td>DC High Power</td>
<td>PLC</td>
<td>IEC 62196-3 CCS 2</td>
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<td>AIS 138 (Part 2) / IEC 61851-23</td>
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<td>Fast Charging</td>
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<tr>
<td>5.</td>
<td>DC High Power</td>
<td>CAN</td>
<td>IEC 61851-24 System A</td>
<td></td>
<td>AIS 138 (Part 2) / IEC 61851-23</td>
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<tr>
<td></td>
<td>Fast Charging</td>
<td>(Optional Private Infrastructure)</td>
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