

Regulatory, Policy and Standards

Date: Sept. 24, 2019 | [India Energy Storage Summit 2019](#)



Agenda

- India Standards Work Program – BIS, AIS
- International Standards Work Program
 - IEC
 - UL
- What next



BIS Standards Work Program:

Standards published

[ETD 51: Electrotechnology in Mobility sectional committee](#)

No	IS number	Title
1	IS/ISO 15118 (Part 1): 2013	Road Vehicles: Vehicle to Grid Communication Interface Part 1 General information and use-case definition
2	IS/ISO 15118 (Part 2): 2014	Road Vehicles: Vehicle to Grid Communication Interface Part 2 Network and application protocol requirements
3	IS/ISO 15118 (Part 3): 2015	Road Vehicles: Vehicle to Grid Communication Interface Part 3 Physical and data link layer requirements
4	IS/ISO 15118 (Part 4): 2019	Road Vehicles: Vehicle to Grid Communication Interface Part 4 Network and application protocol conformance test
5	IS/ISO 15118 (Part 5): 2018	Road Vehicles: Vehicle to Grid Communication Interface Part 5 Physical layer and data link layer conformance test
6	IS/ISO 15118 (Part 8): 2018	Road Vehicles: Vehicle to Grid Communication Interface Part 5 Physical layer and data link layer requirements for wireless communication
7	IS/ISO 17017 (Part 1): 2018	Electric vehicle conductive charging system – Part 1; General requirements



BIS Standards Work Program

[ETD 51: Electrotechnology in Mobility sectional committee - Draft Finalized \(under print\)](#)

No	IS number	Title
1	ETD 51 (13422)	Electric Vehicle Conductive Charging System Part 21 Electromagnetic Compatibility EMC Section 1 on-board chargers
2	ETD 51 (13424)	Electric Vehicle Conductive Charging System Part 21 Electromagnetic Compatibility EMC Section 2 off-board chargers
<u>Work in progress</u>		
Protocol Standards (adapted from IEC TC 69); D.C. Charger Standards IS 17017(Part 23) and IS 17017(Part 24)		
Connector Standards (adapted from IEC TC 23; SC-23H): Internal circulation for adoption		
<u>Five Working panel formed:</u>		
1. "Roadmap/ Landscaping for Standards" ; 2. Light FV infrastructure; 3. EV Park & charge infrastructure; Heavy commercial EV infrastructure; 5. EV infrastructure network		



BIS Standards Work Program:

Standards published

[ETD 52: Electrotechnology in Energy Storage sectional committee](#)

No	IS number	Title
1	IS 17067 (Part 1) : 2018 IEC 62933-1 : 2018	Electrical energy storage system: Part -1 : Vocabulary
2	IS 17067 (Part 2 / Sec1) : 2019	Electrical Energy Storage EES Systems Part 2 Unit Parameters and Testing Methods Section 1 General Specification
3	IS 17067 (Part 4 / Sec 1) : 2019	Electrical Energy Storage EES Systems Part 4 Guidance on Environmental Issues Section 1 General Specification
4	IS 17092 : 2019	'Electrical Energy Storage Systems: Safety Requirements'



BIS Standards Work Program

[ETD 52: Electrical Energy Storage Systems Sectional Committee: Standards under circulation for comment](#)

No	IS number	Title
1	ETD 52 (13949)	Electrical energy storage (EES) systems - Part 5-1: Safety considerations for grid-integrated EES systems - General specification
2	ETD 52 (13979)	Electrical energy storage (EES) systems Part 5 Safety requirements for grid integrated EES systems Section 2 electrochemical based systems



AIS Standards

Indian Standard	Ref. Standard
AIS 038 Rev 1 :Requirements for Construction and Functional Safety	ECE R 100
AIS 039 Rev 1 : Measurement of Electrical Energy Consumption (Wh/km)	ECE R 101
AIS 040 Rev 1 : Method of Measuring the Range (km)	ECE R 101
AIS 041 Rev 1 : Measurement of Net Power & Maximum 30 minute power	ECE R 85
AIS 049 Rev 1 : CMVR Type Approval for EV	-
AIS 048 : Safety Requirements for Traction Batteries	USABC, ISO/IEC Standards



IEC Standards Work Program:

TC 69 : Electric road vehicles and electric industrial trucks

Standards published

No	IEC number	Title
1	IEC 61851-1:2017	Electric vehicle conductive charging system - Part 1: General requirements
2	IEC 61851-21-1:2017	Electric vehicle conductive charging system - Part 21-1 Electric vehicle on-board charger EMC requirements for conductive connection to AC/DC supply
3	IEC 61851-21-2:2018	Electric vehicle conductive charging system - Part 21-2: Electric vehicle requirements for conductive connection to an AC/DC supply - EMC requirements for off board electric vehicle charging systems
4	IEC 61851-23:2014	Electric vehicle conductive charging system - Part 23: DC electric vehicle charging station
5	IEC 61851-24:2014	Electric vehicle conductive charging system - Part 24: Digital communication between a d.c. EV charging station and an electric vehicle for control of d.c. charging
6	IEC 61980-1:2015 Edition 1.0	Electric vehicle wireless power transfer (WPT) systems - Part 1: General requirements



IEC Standards Work Program:

TC 69 : Electric road vehicles and electric industrial trucks

No	IEC number	Title
7	IEC TS 61980-2:2019	Electric vehicle wireless power transfer (WPT) systems - Part 2: Specific requirements for communication between electric road vehicle (EV) and infrastructure
8	IEC TS 61980-3:2019	Electric vehicle wireless power transfer (WPT) systems - Part 3: Specific requirements for the magnetic field wireless power transfer systems
9	IEC 62576:2018	Electric double-layer capacitors for use in hybrid electric vehicles - Test methods for electrical characteristics
10	IEC TS 62840-1:2016	Electric vehicle battery swap system - Part 1: General and guidance
11	IEC 62840-2:2016	Electric vehicle battery swap system - Part 2: Safety requirements
12	IEC 63119-1:2019	Information exchange for electric vehicle charging roaming service - Part 1: General



IEC Standards Work Program:

TC 120 : Electrical Energy Storage (EES) Systems

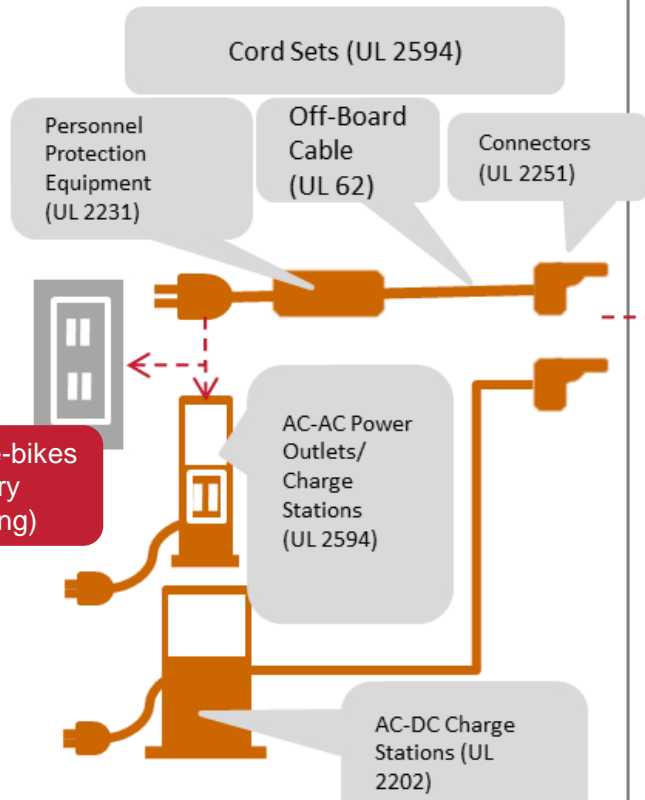
Standards published

No	IEC number	Title
1	IEC 62933-1:2018	Electrical energy storage (EES) systems - Part 1: Vocabulary
2	IEC 62933-2-1: 2017	Electrical energy storage (EES) systems - Part 2-1: Unit parameters and testing methods - General specification
3	IEC TS 62933-3-1: 2018	Electrical energy storage (EES) systems - Part 3-1: Planning and performance assessment of electrical energy storage systems - General specification
4	IEC TS 62933-4-1: 2017	Electrical energy storage (EES) systems - Part 4-1: Guidance on environmental issues - General specification
5	IEC TS 62933-5-1: 2017	Electrical energy storage (EES) systems - Part 5-1: Safety considerations for grid-integrated EES systems - General specification

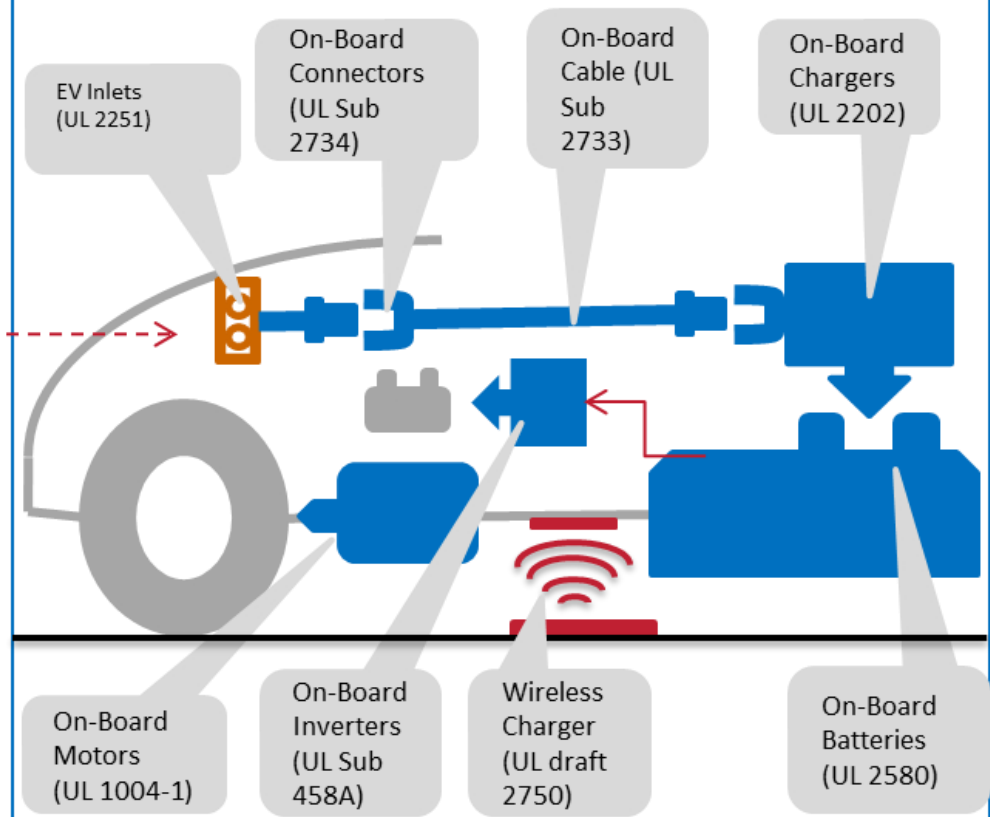


UL Standards

Off-board Components



On-board Components



UL Standards: Electric Vehicle

Standard No.	Standard Title
UL 248-20	Outline for Low-Voltage Fuses - Part 20: Electric Vehicle (EV) Fuses
UL 2202	Electric Vehicle (EV) Charging System Equipment
UL 2231-1	Standard for Personnel Protection Systems for Electric Vehicle (EV) Supply Circuits: General Requirements
UL 2231-2	Standard for Personnel Protection Systems for Electric Vehicle (EV) Supply Circuits: Particular Requirements for Protection Devices for Use in Charging Systems
UL 2251	Standard for Plugs, Receptacles, and Couplers for Electric Vehicles
UL 2263	Electric Vehicle Cable
UL 2271	Standard for Batteries for Use In Light Electric Vehicle (LEV) Applications
UL 2580	Standard for Batteries for Use in Electric Vehicles
UL 2594	Standard for Electric Vehicle Supply Equipment
UL 2747	Outline for Electric Vehicle Power Supplies
UL 2871	Outline for Electric Vehicle (EV) Service and Production Chargers
UL 9741	Outline for Bidirectional Electric Vehicle (EV) Charging System Equipment



UL Standards: Energy Storage System

Standard No.	Standard Title
UL 9540	Energy Storage Systems and Equipment
UL 9540 A	Test Method for Evaluating Thermal Runaway Fire Propagation in Battery Energy Storage Systems
UL 1973	Test Method for Evaluating Thermal Runaway Fire Propagation in Battery Energy Storage Systems
UL 3001	Distributed Energy Generation and Storage Systems



Case study: Electrical Energy Storage System Standards

Need for Standards

- Mission for Energy Access
- Electric Mobility Mission
- Solar and Wind Mission
- Smart Grid Mission

Development of India Standards

- Proactive step by BIS – 1st country to develop EESS std.
- Study globally published standards
- Adopt / adapt (review and revise) as suitable to India conditions

Globally published Standards

- System safety standard UL 9540, 9540-1
- System performance standard - none; PNNL 22000-1
- Components of system - IEC 62933 series

Draft - India Standard

- Draft Indian Standard with UL 9540 as base document
- Draft performance standard based on PNNL 22000 and IEC

Indian Standards
IS 17092



BIS to quickly develop India Standards through bringing India-specific requirements to globally published standards

What next ???

Questions we would like to answer:

1. What standards are supposed to deliver?
2. Are these standards relevant for India?
3. How do we make Standards bring frugal innovation for India without compromising on safety and performance?
4. Is having standards alone sufficient?



Thank you...



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