A Report on Technical Seminar, Conference and Roundtable

to Building Robust Safety Ecosystem for EVs in India

Preamble:

Electric vehicle growth is an imperative for India and its commitment to a climate change action plan. NITI Aayog has set ambitious EV adoption goals for the government of India, aiming for EV sales of 70% for all commercial cars, 30% for private cars, 40% for buses, and 80% for two- and three-wheelers by 2030. This is in line with the country's goal to achieve net-zero carbon emissions by 2070. Over the last three years, 0.52 million EVs were registered in India, according to the Ministry of Heavy Industries. EVs recorded robust growth in 2021, supported by the implementation of favorable policies and programs by the government.[1] A technical seminar followed by conference-cum-roundtable was organized by UL Standards & Engagement in partnership with the U.S. Commercial Services, NITI Aayog, Bureau of Indian Standards, WRI India and the Council on Energy Environment and Water on August 22-23, 2023 in New Delhi.

Report and recommendations:

I. Technical Seminar – August 22, 2023 (10:00 to 17:30 hrs.)

The technical seminar was attended by 100+ delegates, with 26 subject matter experts (representing policy makers, regulators, industry, academia, and research organizations) to presenting, discussing, deliberating, and providing recommendations on building a robust safety ecosystem for EVs in India. The inaugural address by Shri. Sudhendu J Sinha, advisor – infrastructure connectivity – transport & electric mobility for NITI Aayog provided a vision of India with safer eMobility and set the direction for the technical seminar to evolve a timebound, actionable outcome. The address from Smt. Sonya Bird, vice president, international standards, UL Standards & Engagement, and Shri. Madhav Pai, chief executive officer of WRI India set the tone for interactive sessions. Recommendations included the following:

1. Robust battery design with advanced thermal management systems
2. Building a robust quality ecosystem with the following:
    a. global standards harmonization
    b. establishing testing laboratories
    c. conformance program with continued compliance of entire systems, including components
3. A technology- and design-agnostic approach to standards development
4. A means of capturing data and making it available for traceability, repurposing, and recycling of batteries
5. Standards to address collection, segregation, and transportation of batteries for repurposing and recycling with safety, performance, and durability criteria for the repurposed and recycled batteries
6. Skills development in the entire value chain:
    a. design and manufacturing stage
    b. service and maintenance stage
    c. consumer awareness

[1] https://www.ibef.org/blogs/electric-vehicles-market-in-india

7. A guidebook for first responders on EV fire mitigation

II. Roundtable discussion – August 23, 2023 (10:00 to 11:30 hrs.):

The closed-door roundtable discussion focused on addressing the current status of EV safety and how India can develop safer EVs. It was attended by over 30 industry leaders (list of members attached) and was chaired by Smt. Nidhi Khare, additional secretary for the Ministry of Consumer Affairs. In his opening remarks, Smt. Nidhi Khare emphasized the need for stakeholders to engage in standard setting for the following reasons:

a. To look for solutions with continuous improvement in the learning curve
b. To avoid stifling innovation
c. To facilitate the evolution of new technologies
d. For ease of consumer adoption

Khare also briefed attendees on the Government of India's initiative of establishing national test houses in Kolkata, Chennai, and Ghaziabad, to facilitate testing and safer adoption of EV technology. He also emphasized that battery swapping and interoperability should be the long-term way forward for Indian industry.

The following action points evolved from the roundtable:

1. Establish system for data availability and traceability at every stage of the battery life cycle
2. Global harmonization of standards with India-relevant considerations
3. Advance development of standards for the service segment of the EV industry, and transportation of batteries
4. Revisit grid codes to support safer EV adoption
5. Focus on customer-centric design, addressing safety and consideration of Indian climatic conditions, as well as cybersecurity, and sustainability
6. Establish a robust standards implementation mechanism with continued compliance
7. Establish labs in India to test products for countries around the world
8. Establish industry/academia programs for research, education, and skills development
9. Focus downstream, build consumer awareness programs, and measure the impact

The roundtable concluded with commitment from all the participants to volunteer and actively contribute toward the action plan. A progress report shall be presented at the next conference-cum-roundtable, scheduled for August 2024.

III. Conference: August 23, 2023 (11:30 to 18:15 hrs.)

The direction to the conference proceedings was set by Shri. Vinnie Mehta, director general, Automotive Component Manufacturers Association of India; Smt. Nidhi

Khare, additional secretary, Ministry of Consumer Affairs; Shri. Sudhendu J Sinha, advisor – infrastructure connectivity – transport & electric mobility, NITI Aayog; Shri. Jonathan Heimer, minister counselor for commercial affairs, U.S. Department of Commerce; and Dr. David Steel, executive director, UL Standards & Engagement.

In the inaugural session, speakers emphasized the need for safety in the entire value chain of the EV ecosystem, as well as the need for active participation of all stakeholders in order to help spur EV growth in India.

A few recommendations and insights presented by the speakers are as follows:

- The importance of conformity of performance (CoP) and the life cycle management of batteries cannot be overstated, particularly in the context of electric vehicles. Establishing standards and regulations tailored to Indian conditions is crucial for ensuring the safety and reliability of EVs. To expedite the process, a time-bound issuance of certification to manufacturers is essential. It was recommended that an organization work as a single window for all the EV-related regulations and compliance. Harmonizing standards with global organizations will ensure compatibility and competitiveness. Meeting these standards requires a well-trained workforce, hence it is important to emphasize the need for skilled manpower.
- Regulations covering the transportation and handling of batteries are essential for both safety and environmental reasons. Initiatives to enhance customer awareness about EVs and their benefits are vital for market growth. Simultaneously, the development of future standards must be a continuous effort. Collaboration between academia and industry can foster innovation and knowledge sharing.
- Efficient data collection, sharing, and security measures must be implemented for the complete traceability of the EV value chain, including the safety of the grid alongside EVs. Furthermore, establishing service centers for EVs and defining safety parameters are paramount to ensuring a sustainable and secure EV ecosystem.

The conference concluded with a panel of experts including Honorable Union Minister Shri. Nitin Gadkari, Ministry of Road Transport and Highways of India, and Mr. Eric Garcetti, ambassador of the United States to India. Participants discussed the future of eMobility and the significance of sustainable and clean transportation solutions for India's future. Mr. Gadkari highlighted the Indian government's commitment to promoting electric vehicles and improving charging infrastructure. He stressed that a transition to eMobility is not just about environmental benefits, but also economic growth and job creation. This occasion also coincided with the landing of Chandrayaan-3 on the moon, symbolizing India's prowess in space exploration. The conference culminated with the release of ULSE’s “Safety Guidelines for Safe Electric Vehicles in India” for stakeholder review. These guidelines aim to ensure the safety of electric vehicles, their components, and charging infrastructure. The standards encompass aspects such as battery safety, electrical safety, and fire safety, to help foster consumer confidence in EVs.

In conclusion, the conference marked a pivotal moment in India's pursuit of sustainable transportation. With the commitment of government leaders, international cooperation, research organizations, and manufacturers to a shared focus on safety and innovation, the future of eMobility in India appears promising and environmentally responsible.

IV. Further actions:

Regional roundtables shall be organized in Chennai and Mumbai – on November 21 and 28 respectively – to collect input from stakeholders in these regions and final action points shall be presented.

Appendix A: Agenda for technical seminar

Safer eMobility

EV Safety Technical Seminar for Atmanirbhar and Surakshit Bharat

Venue: The Ashok Hotel, New Delhi; **Date:** August 22, 2023

From	To	Agenda Topic	Speaker
09:30	10:00	Registration and Tea	
10:00	10:10	Keynote address – 1	**Smt. Sonya Bird** Vice President, ULSE
10:10	10:20	Keynote address – 2	**Sh. Madhav Pai** CEO, WRI India
10:20	10:30	Inaugural address	**Sh. Sudhendu Sinha** Advisor - Infrastructure Connectivity - Transport & Electric Mobility, NITI Aayog
Technical Session #1: EV Battery and Components *(10 mins each speaker + 10 mins Q&A at end)*			
10:30	10:45	Setting the context	**Dr. Kuldeep Singh,** Principal Scientist, CSIR - Central Electrochemical Research Institute (CSIR_CECRI)
10:45	11:45	*Safety readiness of the existing EV and its components in Indian Operating Conditions*	**Dr. Rashi Gupta** Director, Vision Mechatronics
		Safety readiness of Battery Management System in Indian operating conditions and recommendation to build safety ecosystem.	**Sh. Piyush Gupta,** CEO, Lithion Power Pvt. Ltd.
		Safety readiness of EV batteries and components for Indian conditions and required regulation & standards for safe EVs on Indian roads.	**Sh. Shreyas Seethapathy** Head – Battery Engineering Ather Energy
		Indian EV safety ecosystem through the availability of required regulations & standards for safer EVs on the Indian roads	**Sh. Aparna Dhawan,** Senior Counsellor and Head Quality & Standards, Confederation of Indian Industries
11:45	13:00	**Session #2:** EV Infrastructure *(10 mins each speaker + 20 mins Q&A at end)*	
		Global standards and best practices for EV charging infrastructure – India to benchmark.	**Sh. Joseph Bablo** Principal Designated Engineer (PDE) Manager - Energy & Industrial Automation, UL Solutions
		Challenges in the safety management of e-2Ws and e-3Ws with small battery packs	**Sh. Ujjwala Karle*** Director, ARAI

		Importance of safety norms and guidelines for EV infrastructure	**Sh. Abhishek Ranjan**
		Developing a collaborative global standards roadmap for safe EV infrastructure in India	**Sh. Ravindra Desai,** IEEE
		Safety readiness of the EV infrastructures in India including plugin and battery swapping stations	**Sh. Awadhesh Kumar Jha** Vice President Fortum Charge & Drive India Pvt. Ltd
		Gaps in regulations and standards to ensure safety at EV charging infrastructure in India	**Sh. Vivek Krishnaiah** Senior Director, Delta Electronics India R & D Centre
13:00	14:00	Lunch	
14:00	14:40	**Technical Session #3:** Safety management at Repurposing & Recycling	
		Challenges in collection, sorting, and repurposing retired EV batteries.	**Sh. Rajat Verma** Founder and CEO, Lohum
		Gaps in regulations and standards to ensure safety at the reuse & recycling stage of the EV batteries.	**Sh. Nitin Gupta** Co-founder and CEO, Attero
		Safety concerns in storage, transportation, and handling of EV batteries	**Sh. Darshan Virupaksha** Nunam
		Safe and sustainable repurposing and recycling of Li-ion batteries – requirements and recommendations	**Sh. Rohan Singh Bias** Founder and CPO, Ziptrax
14:40	15:40	**Technical Session #4:** Fire Safety & Mitigation	
		Fire suppression system requirement in EVs and at the related infrastructures	**Dr. Judy Jeevarajan** Vice President, ESRI, UL Research Institute
		Emerging technological solutions to ensure safety at different stages of the EV ecosystem.	**Dr Meduri Srinivas** Scientist 'E', Naval Science & Technological Laboratory
		Role of testing and certification in safety management in EV and its components, especially in the battery during EV and post-EV applications	**Sh. Sriparn Saurabh,** Engineering Manager, UL Solutions

		India's preparedness to EV related fire	**Sh. Moreshwar Kudkilwar** Deputy Fire Adviser, Directorate General-Fire Services, Civil Defense & Home Guards, Ministry of Home Affairs
		Emergency Response role in incidents involving electric vehicles.	**Sh. Robert Duval** Northeast Regional Director, and Fire Investigator, NFPA
15:40	16:05	**Breakout session #1:** *Need for stakeholder collaboration framework to reduce safety concerns in the EV ecosystem*	
16:05	17:05	**Panel Discussion**: Tenets of Safe EV Ecosystem in India **Moderated by**: Rishabh Jain, CEEW	**Prashant K Banerjee** Chief Executive Director, SAIM
			Dr. Rahul Walawalkar President, IESA
			Sh. Subrata Mitra Head – Government relationship Ather Energy
			Sh. V V S Sridhar Amara Raja Batteries
			Sh. Shagun Senior Executive – Functional safety, Log9 materials
17:05	17:30	**Breakout session #2:** *Ways to foster Research, Innovation, and Funding for safer EVs*	
17:30	17:40	Way forward	

Appendix B: Agenda for Conference cum Roundtable

Conference on Standards for Safe – Secure – Sustainable Indian EV Ecosystem

Venue: The Ashok Hotel, New Delhi; Date: August 23, 2023

Conference cum Roundtable: Safe EV – India creating benchmark for globe.

Session #1: Roundtable discussion (Closed door, invite only meeting) **Venue:** Friendship Lounge, 3rd Floor, The Ashok Hotel, New Delhi			
10:00	11:25	Safety management in the EV Ecosystem **Evolving a timebound action plan for India** **Chaired by:** Ms. Nidhi Khare	Roundtable discussion (invite only) Moderated by Sh. Parveen, WRI India and Sh. Manjunath, ULSE **Participants**: 1. MoCA (Ms. Nidhi Khare) 2. NITI Aayog (Sudhendu J. Sinha) 3. ULSE (Sonya Bird) 4. WRI (Madhav Pai / Pawan) 5. IIT Madras / CBEEV (Dr. Prabhjot Kaur) 6. IIT Delhi (BK Panigrahi) 7. ICAT (Dr. Madhusudan Joshi) 8. SIAM (Prashant K. Banerjee) 9. IESA (Rahul Walawalkar) 10. IEEMA (Atul Arya) 11. CEEW (Rishabh Jain) 12. SMEV (Ajay Sharma) 13. ISGF (Dr. Reji Pillai) 14. TERI (Dr. I. V. Rao) 15. NABL (Anuja Anand) **Manufacturers**: 16. Tata (Sushant Naik/Rajendra Raut) 17. Suzuki (C V Raman) 18. Vision mechatronics (Dr. Rashi Gupta) 19. C4V (Devashish Aneja) 20. YULU Bikes (R K Misra) 21. Lohia Auto Industries (Ayush Lohia) 22. Shaft Energies Private Limited (Manish Bhardwaj) 23. Charge Zone (Ravindra Mohan) 24. Coulomb EV Solutions Private Limited (Manekdeep Singh Ratra) 25. Blu Smart Mobility (Shivam Khatter) 26. Yuma Energy (Divay Pranav) **US Government:** 27. U.S. Commercial Service (Durra Elmaki) 28. U.S. Commercial Service (Naveen Rai) 29. U.S. Commercial Service (Raman Ahuja)

11:25	11:30	Summarization and putting action plans together	Team

Session # 2: Conference: Venue – Banquet Hall, 3rd Floor, The Ashok Hotel, New Delhi			
From	**To**	**Agenda point**	**Speaker**
11:00	11:30	Registration and tea & snacks	
11:30	11:40	Opening address	**Dr. David Steel** Executive Director, ULSE
11:40	11:50	Welcome remarks	**Sh. Jonathan M. Heimer** Minister Counselor for Commercial Affairs, U.S. Department of Commerce
11:50	12:00	India EV vision	**Sh. Sudhendu Sinha** Advisor - Infrastructure Connectivity -Transport & Electric Mobility, NITI Aayog
12:00	12:15	Special address	**Smt. Nidhi Khare** Additional Secretary (Consumer Affairs), MoCA
12:15	12:30	Inaugural address	**Sh. Vinnie Mehta** Director General, ACMA (Automotive Component Manufacturers Association of India)
Government Initiatives & Industry perspective			
12:30	12:40	*Global standards collaboration to evolve harmonized national standards*	**Dr. Madhusudan Joshi** Deputy General Manager, The International Centre for Automotive Technology (ICAT)
12:40	12:50	*Standards and policies to drive innovation (Industry viewpoint)*	**Sh. R K Misra** President, SMEV “Society of Manufacturers of Electric Vehicles” and Founder, YULU Bikes
12:50	13:00	*US best practices and learnings for India to safer EV ecosystem*	**Smt. Mehnaz Ansari** Sr. Regional Representative- South Asia Indo Pacific Region, USTDA
13:00	13:15	*Indian EV industry – marching towards global leadership: enablers and collaborations*	**Sh. Sushant Naik** Chairman, Electric Mobility Group (EMG) of SIAM (Society of Indian Automobile Manufactures) and Global Head, Government and Public Affairs, TATA Motors Ltd
13:15	13:30	*Standards across value chain – a use case by Omega Seiki Mobility and recommendations for Indian industry*	**Sh. Uday Narang** Founder, Omega Seiki Mobility

13:30	14:30	Lunch	
14:30	14:50	**Breakout #1:** *How can we encourage skill development for battery, safety in EVs, stationary applications & recycling*	
14:50	15:10	**Breakout #2:** *Criticality of standards, testing & certification for safe batteries in EVs, re-use and recycling*	
15:10	15:30	**Breakout #3:** *Policy & regulatory frameworks needed for a safe EV industry in India*	
15:30	15:50	*Standards enabling Global safety ecosystem for EV and opportunities for India*	**Sh. Joseph Bablo** Principal Designated Engineer (PDE) Manager - Energy & Industrial Automation, UL Solutions
16:00	16:05	Q & A	
16:05	16:15	Tea break	
16:15	16:45	**Panel discussion**: India EV ecosystem - Setting benchmark to world. **Moderated by:** Pawan M, WRI India **Topic**: Enablers for India to set global benchmarks for EV infrastructure	**Panelists:** • NITI Aayog (Mr. Sudhendu Sinha) • SIAM (Mr. Prashant K. Banerjee) • SMEV (Mr. Sohinder Gill) • MOHUA (Mr. Kunal Kumar) • Lohia Auto Industries (Mr. Ayush Lohia, CEO) • Omega Seiki Mobility (Mr. Uday Narang)
16:45	17:00	Report out from conference	**Dr. David Steel,** Executive Director ULSE
17:00	17:05	**Release of "Safety guidelines for safe EV batteries"**	
17:05	17:15	Overview of the guideline	**V. Manjunath,** ULSE
17:15	17:30	Special Address	**Sh. Eric Garcetti** United States Ambassador to India
17:30	18:00	Special Address	**Sh. Nitin Gadkari** Union Minister, MoRTH
18:00		High tea	