



Technical Visit: High Voltage Commercial EV Training and MRO Facilities, Putrajaya

By

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He is a committee member of SSIG Session 2026/2027.

The Institution of Engineers, Malaysia (IEM), through the Seniors Special Interest Group (SSIG), successfully organised a technical visit titled “High Voltage Commercial EV Training and MRO Facilities, Putrajaya” on 28 July 2026, from 8:30 am to 1:00 pm. The visit was held at the Elektromodula Sdn Bhd (EMSB) Centre of Excellence for Electric Vehicles (Pusat Kecemerlangan Kenderaan Elektrik) in Putrajaya and was attended by 28 participants.



The technical visit provided an enriching opportunity for industry professionals and technical personnel to gain first-hand exposure to Malaysia’s rapidly developing commercial electric vehicle (EV) ecosystem. The programme was designed to introduce participants to Elektromodula’s High Voltage Electric Vehicle (HVEV) training facilities and hands-on Maintenance, Repair and Overhaul (MRO) operations for single-deck electric buses.

In addition to technical exposure, the programme covered key aspects of high-voltage safety, EV technical training, emergency response, commercial EV maintenance and fast-charging technology. The visit provided a valuable platform for knowledge sharing and professional engagement while highlighting the skills, technologies and infrastructure required to support Malaysia’s transition towards electric mobility.

A Closer Look at Electric Bus MRO Operations

The programme commenced with an introduction to EMSB, its company profile, followed by an overview of its MRO operations for electric buses in Putrajaya.

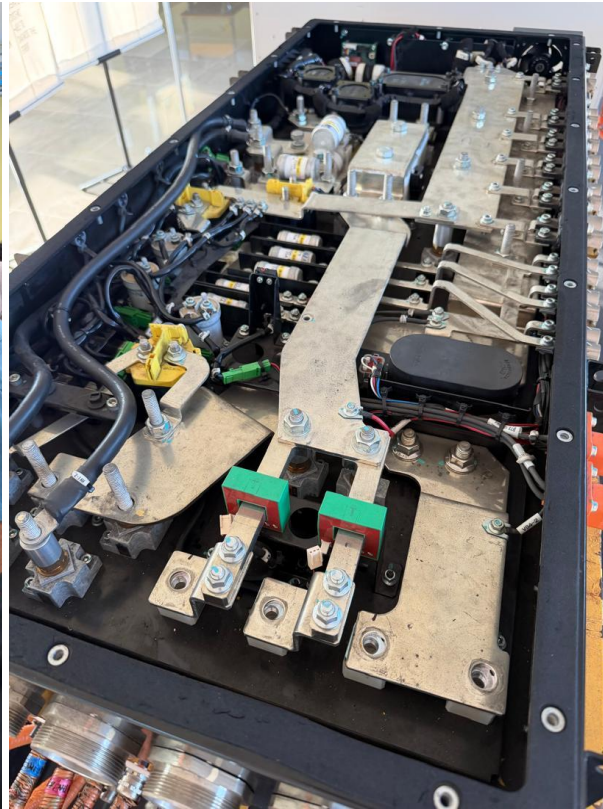


Participants gained insights into the technical requirements associated with maintaining commercial electric buses, including systematic inspection, diagnostics, preventive maintenance and the safe handling of high-voltage systems.

The session provided a practical perspective on the operational and technical considerations involved in maintaining electric commercial vehicles. It also highlighted the importance of developing appropriate technical competencies as electric buses become increasingly integrated into public transportation systems.

Introduction to High-Voltage EV Safety and Technical Training

A key component of the visit was the introduction to High Voltage Electric Vehicle (HVEV) safety and technical training. Participants were introduced to Elektromodula's structured EV training pathways, developed in collaboration with TÜV Rheinland, comprising TÜV Rheinland-certified Levels 1, 2 and 3. The progressive training framework is designed to build technical knowledge and practical competency at each level, with a strong emphasis on high-voltage safety, EV systems, diagnostics, maintenance procedures and safe working practices.



The session underscored the importance of developing a competent and properly trained workforce to support the growing deployment of electric vehicles in Malaysia. As EV technologies continue to evolve, appropriate technical training and high-voltage safety awareness are essential to ensuring safe, reliable and efficient vehicle operations.

Strengthening Emergency Response Skills Through CPR and AED Demonstration

Recognising the importance of safety beyond technical procedures, the programme also included a first-aid demonstration covering Cardiopulmonary Resuscitation (CPR) and Automated External Defibrillator (AED) procedures.



The demonstration reinforced the importance of emergency preparedness, particularly in technical and workshop environments where personnel may encounter electrical and other occupational hazards. Participants were introduced to the fundamental principles of responding to an emergency, including the appropriate use of CPR and AED equipment to provide immediate assistance while awaiting professional medical support. This practical component complemented the technical sessions by emphasising the importance of safety and emergency response readiness in the workplace.

Exploring Malaysia's Super Quick Charge EV Technology

One of the key highlights of the technical visit was the visit to Putrajaya Sentral, where participants had the opportunity to observe the Super Quick Charge (SQC) system used by the Nadiputra NEDO EV bus, one of Malaysia's early demonstrations of super-fast charging technology for electric public buses. Participants also had the opportunity to experience the technology firsthand by taking a ride on the Nadiputra NEDO EV bus, gaining practical insight into its operation, passenger experience, and potential application in public transportation.



The Nadiputra NEDO EV bus is operated in Putrajaya as part of an initiative aimed at demonstrating the benefits of electric buses together with a super-rapid charging system. The Nadiputra NEDO EV Bus Demonstration Project was established through an international collaboration between Perbadanan Putrajaya (PPj) and Japan's New Energy and Industrial Technology Development Organisation (NEDO).

Initiated in 2015, the project was designed to demonstrate the technical and operational performance of electric buses equipped with Super Quick Charge (SQC) technology under Malaysia's tropical operating conditions. The project involved the deployment of electric buses, super-quick charging infrastructure and supporting monitoring systems in Putrajaya, with participation from a consortium of Japanese technology companies and Malaysian industry partners.

The initiative was intended to demonstrate the operational benefits of EV buses and their accompanying rapid-charging technology, while supporting Putrajaya's aspirations to develop into a sustainable, low-carbon and green city. The project represents an important example of international technological cooperation and knowledge transfer in support of Malaysia's sustainable transportation objectives.

Rapid Charging Through Toshiba SCiB Battery Technology

A particularly interesting aspect of the Nadiputra NEDO EV bus is its battery and charging technology. The bus is equipped with SCiB™ batteries supplied by Toshiba, which utilise lithium titanium oxide (LTO) technology in the anode. LTO-based battery technology offers several characteristics that are particularly relevant to demanding transportation applications, including high safety, long service life, good low-temperature performance, rapid charging capability, high input/output power and substantial usable capacity.

Toshiba's SCiB technology has been applied across a range of vehicle, industrial and infrastructure applications, including automobiles, buses, railway vehicles, elevators and power-generation facilities. The battery system is designed to support frequent rapid charging, with the Nadiputra NEDO EV bus capable of achieving a full charge in approximately 10 minutes under the designated SQC system. The charging infrastructure forms an integral part of the overall system. Three SQC terminals are located at Putrajaya Sentral. This arrangement enables the bus to operate with strategically located rapid-charging points rather than relying solely on prolonged depot charging.

The SQC approach is particularly notable when compared with conventional charging strategies for commercial electric vehicles. While many commercial EVs may require several hours of charging, particularly when using depot-based charging, the Nadiputra NEDO system demonstrates how high-power opportunity charging can be integrated into public bus operations to minimise downtime and support more continuous vehicle utilisation.

The technology deployed for the Nadiputra NEDO EV bus therefore represents an interesting and distinctive approach to electric bus operation. Its combination of high-power rapid charging, overhead pantograph technology and LTO-based battery technology differs from many other commercial EV configurations currently deployed in Malaysia and provides an instructive case study for understanding alternative approaches to electric public transportation.

For the technical visit participants, observing the SQC system first-hand provided an opportunity to connect the concepts discussed during the earlier HVEV training and MRO sessions with an operational example of electric bus charging infrastructure.

Knowledge Sharing and Industry Engagement

The technical visit concluded with a group photo session, marking the successful completion of an informative and engaging programme involving 28 participants. Overall, the visit served as a valuable platform for knowledge sharing, technical benchmarking and industry engagement.

Participants gained a deeper understanding of Malaysia's commercial EV ecosystem, covering areas such as electric bus MRO operations, high-voltage vehicle technologies, technical training pathways, workplace safety, emergency response and charging infrastructure.



The exposure to the Nadiputra NEDO EV bus and its SQC charging system was particularly valuable in demonstrating that there is no single approach to commercial EV deployment. Vehicle battery technology, charging speed, route characteristics, operational schedules and charging infrastructure must all be considered together when developing an effective electric public transportation system. The successful organisation of the visit also demonstrated the value of collaboration between professional engineering communities and industry stakeholders in preparing the workforce for the ongoing transition towards electric mobility.

As the adoption of electric vehicles continues to accelerate, initiatives such as this technical visit play an important role in bridging the gap between engineering knowledge and real-world industry practices. Exposure to actual EV facilities, maintenance operations, high-voltage safety procedures, battery technologies and charging infrastructure enables participants to better appreciate the technical competencies and supporting systems required to develop and operate the next generation of transportation.

The visit to Elektromodula Sdn Bhd (EMSB) Centre of Excellence for Electric Vehicles was therefore more than a technical learning experience. It provided an opportunity for participants to exchange knowledge, strengthen professional networks and gain a broader appreciation of the opportunities and challenges associated with Malaysia's evolving electric vehicle landscape.

Through continued industry engagement and technical knowledge-sharing initiatives, IEM and SSIG remain committed to advancing professional development and contributing to the growth of Malaysia's electric vehicle and sustainable mobility ecosystem.

The initiative also supports the broader objectives of IEM's **IMPACT2030** strategy, particularly its emphasis on collaboration and industry integration beyond the construction sector. By deepening engagement with emerging and strategically important industries, IEM seeks to strengthen its relevance and professional contribution to sectors that are critical to Malaysia's energy transition, net-zero aspirations, and long-term economic growth.



TECHNICAL VISIT: HIGH VOLTAGE COMMERCIAL EV TRAINING AND MRO FACILITIES, PUTRAJAYA

Organized by : Seniors Special Interest Group (SSIG), IEM

Commitment Fees

(inclusive SST)

(Non refundable & non transferable)

IEM Member : RM 50.00

Non Member : RM 70.00

Date : 28 July 2026 (Tuesday)

Time : 8.30 am – 1.00pm

Address : No 28, Jalan Industri Putra 1, Presint 14, 62050 Putrajaya

Transport : Transportation provided
(Departure from Wisma IEM)

Synopsis

BEM Approved CPD Hours: 3

Ref. No.: IEM26/HQ/278/V

This technical visit introduces participants to Electromodula's High Voltage Electric Vehicle (HVEV) training facilities and hands-on Maintenance, Repair and Overhaul (MRO) operations for single-deck electric buses. Participants will gain insights into TÜV Rheinland-certified EV training pathways, including Levels 1, 2 and 3, as well as high-voltage safety practices, real-world diagnostics, and maintenance procedures for commercial EVs. The programme includes a visit to Putrajaya Sentral to observe one of Southeast Asia's fastest pantograph charging systems, a tour of EMSB's Centre of Excellence for Electric Vehicles (Pusat Kecemerlangan Kenderaan Elektrik) at Presint 14, and a CPR and AED demonstration to reinforce emergency response capabilities. Overall, the visit provides a valuable platform for knowledge sharing, benchmarking, and collaboration while offering a deeper understanding of Malaysia's commercial EV ecosystem, workforce development initiatives, and high-voltage vehicle technologies.

Itinerary of the visit

8:30 am	Depart from IEM, Petaling Jaya
9:30 am	Arrival of the participant
10:00 am	EMSB Company Profile Presentation & MRO of Electric Buses in Putrajaya
10:20 am	Introduction to HVEV Safety & Technical Training
11:00 am	Demonstration for first aid (CPR & AED)
11:15 am	Tea Break
11:30 am	Visit to Putrajaya Sentral-Pantograph charging demonstration
12:45 pm	Group Photo Session
1:00 pm	End of Visit and Depart to IEM, Petaling Jaya



Why Join This Visit?

This visit enables the participants to:

- Benchmark EV bus MRO operations.
- Sneak peek at HVEV Training Centre safety modules.
- First Aid demonstration (CPR & AED)
- Observe Putrajaya Sentral's pantograph fast-charging system.
- Visit EMSB's Centre of Excellence for Electric Vehicles (Presint 14).
- Learn EV safety standards and high-voltage protocols.



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Photo on the flyer for the Technical Visit: High Voltage Commercial EV Training and MRO Facilities, Putrajaya.