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NMB Unveils Groundbreaking Wireless-Powered IoT Battery Monitoring System at NICE 2025

Kuala Lumpur, 9 October 2025 – NMB (NanoMalaysia Berhad), an agency under the Ministry of Science, Technology and Innovation (MOSTI), in strategic collaboration with Enhance Track Sdn Bhd and Universiti Tenaga Nasional (UNITEN), officially launched its Wireless-Powered IoT Battery Water Level Sensor (BWLS) System today at the National Innovation and Commercialisation Expo (NICE) 2025. The launch was officiated by the Minister of Science, Technology and Innovation (MOSTI), YB Chang Lih Kang.

The BWLS System is an advanced monitoring solution designed to enhance the reliability of industrial Uninterruptible Power Supply (UPS) systems. Developed for use with nickel-cadmium batteries, the system enables real-time monitoring of electrolyte levels and operating conditions, eliminating the need for manual inspections. This innovation is particularly valuable for high-risk, remote environments such as oil and gas platforms, where efficient battery maintenance is critical to operational safety.

The Minister of Science, Technology and Innovation (MOSTI), YB Chang Lih Kang, said: "The launch of the BWLS System reflects Malaysia's commitment to advancing homegrown innovations that strengthen industrial safety, sustainability, and competitiveness. This technology also supports our national agenda for high-tech industrialisation, digitalisation, and greener operations."

Powered by Malaysian Energy Transmission Technology (METT), the system wirelessly transmits energy via a 919 MHz RF signal to sensor units embedded with graphene-based antenna reflectors, boosting energy transfer efficiency by 15 to 20 per cent. These auto-calibrating sensors adapt to changing environmental and battery conditions, ensuring accurate readings. Sensor data is then transmitted via LoRa or Wi-Fi to a centralised monitoring dashboard that provides real-time visibility of battery levels, temperature, and fault alerts.

NMB's Chief Executive Officer, Dr Rezal Khairi Ahmad, said: "Today, we introduce a locally developed, market-ready solution that offers industrial operators a smarter, safer, and more cost-effective approach to battery monitoring and predictive maintenance. This innovation represents a leap in operational efficiency and safety, with strong commercialisation potential across the energy, oil and gas, and broader industrial sectors."

Enhance Track's Managing Director, Ts. Dr Benedict Foo mentioned that: "The newly developed battery water level sensor aligns with ongoing digitalisation programs and efforts in the oil and gas as well as power utility sectors. This innovative solution supports the move towards Condition-Based Maintenance (CBM), enabling real-time monitoring and predictive maintenance of critical battery systems. By leveraging advanced wireless-powered IoT technology, the sensor helps operators avoid unexpected equipment failures, optimise maintenance schedules, and enhance operational safety and efficiency in challenging industrial environments."



In offshore and onshore oil and gas facilities, UPS systems play a vital role in maintaining emergency lighting, alarms, communication devices, and critical equipment during unexpected power outages. These systems rely on nickel-cadmium batteries that require constant monitoring of electrolyte levels to prevent malfunctions, overheating, or thermal runaway. However, due to their placement in hazardous or inaccessible areas, manual inspections can be both dangerous and resource-intensive. The BWLS System addresses these challenges by enabling wireless, real-time monitoring of battery electrolyte levels and cell conditions without the need for manual and physical checks or time-based battery replacements.

Designed with a modular architecture, the BWLS System is highly scalable, making it adaptable for battery banks of various sizes and configurations. Unlike conventional monitoring devices, it is completely battery-free, eliminating the need for long-term maintenance on the battery water level sensor itself. Its non-intrusive installation process does not interfere with battery integrity, ensuring seamless deployment even in sensitive or high-risk environments, such as offshore platforms, where UPS batteries power critical assets, including firewater pumps, lighting, and communication networks. Sensors feature LED indicators for quick fault identification, external alarm contacts for system integration, and a simple daisy-chain installation process with pre-cut cables for fast deployment.

The solution has already been field-tested at TNB Research's substation in Kajang, proving its robustness in real-world conditions. By reducing the need for manual inspections, it lowers maintenance costs, minimises manpower exposure to hazardous environments, and prevents failures that could otherwise lead to costly downtime or fire hazards. This blend of technological advancement, environmental responsibility, and economic value positions the BWLS System as a breakthrough innovation with strong global market potential.

NICE 2025 was held from 6–9 October 2025 at the World Trade Centre, Kuala Lumpur.

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