Webinar on Towards Specialization Needs of Railway Systems: Series #3 Introductory Knowledge of AC and DC Railway Systems in Malaysia - Rail Return Current Circuits and Earthing

SPEAKERS :

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5.30 PM - 7.30PM

REGISTRATION FEES

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IEM MEMBERS : RM 15.00

IEM NON MEMBERS : RM 70.00

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SYNOPSIS

This Series #3 Technical Talk is a continuation of our IEM Series #1 and Series #2 Talks under the theme of Towards Specialization needs of Railway Systems.

With AC and DC Railway Schemes, the train operating current flows through the contact line to the electric rail vehicle (ERV). The return current for traction and regenerative braking current, flows from the ERV via the return circuit to the traction power substation.

The running rails serve as the primary conductors for return current of the AC and DC railway systems. Up to several thousand amperes can flow In the return circuit and cause voltages at the running rails and conductive parts of the ERVs during operation. To avoid voltages which could be potentially dangerous when bridged by passengers and staff, the return circuits need to be designed adequately with appropriate measures for earthing and bonding. However, the measures for earthing and bonding applied to the return circuits differ fundamentally between AC and DC schemes.

In AC railways, the rail-to-earth voltages are reduced by bonding other metallic conducting elements to the running rails which are earthed, eliminating any possibility of affecting people and ensuring the entire system can be switched off safely in case of faults.

For DC railways, the running rails trackworks are insulated and floated against earth. To reduce the rail-to-earth voltages in or near the DC railway installations, other measures are required e.g. installation of parallel return conductors and/or voltage limiting devices (VLDs).

This Talk will address the above electrical safety considerations in the design of the return circuits for both AC and DC railway schemes in the context of relevant EN standards for electrical railway transportation projects.

SPEAKERS' BIODATA

Ir. Dr Amir Basha Graduated with B.Sc. (Eng) 1st Class Hons, from University of London King 's College in 1974, and M.Sc. and Ph.D in Power Systems from University of Manchesterin 1976 and 1979 respectively. Served LLN/TNB for 33 years (1974-2007) and was one of those several local pioneer engineers who were involved in the planning, design, implementation and operation of the 500kV/275kV/132kV National Power System Grid, holding positions of Senior Engineer and Chief Engineerin the Development Planning and System Operation Divisions. He was principally involved in the setting up of UNITEN and TNB Research (full subsidiaries of TNB) in the mid-1990s, as the First (Founding) Dean College of Engineering UNITEN and Managing Director of TNB Research, respectively before his retirement in 2007. Since then, he has been with Minconsult leading/assisting teams involved in power system projects, such as power generating plants, electric traction rail projects (LRT/MRT, KTMB and High Speed Rail (HSR), Solar PV projects, Management & Engineering Audits of the ESI, and formulation of Feasibility Study Reports/MasterPlan Study Reports related to Electricity/Energy Planning. A BEM-registered Professional Engineer Practicing Certificate and ASEAN Chartered Professional Engineer, Corporate Member ofIEM andAlumniHarvard Business School Senior Management Program.

Mohd Syazwan bin Sulaiman was graduated from University of New Brunswick (2012, Canada) in Electrical Engineering (Power System). He started his career in Minconsult Sdn Bhd and his first rail project was Kelana Jaya Extension Line (KLJ) Project. He was involved in both design and site office experience as Project Engineer and Assistant Resident Engineer respectively. Since 2017, he was involved in various rail projects such as LRT3, KL-SG HSR, and several high level railway studies. In KL-SG HSR (TAC Project), he had an opportunity to model and run the operation simulation of KL-SG HSR using OpenTrack software. He is currently working in LRT3 project as a system interface and electrical engineer for LV system.