

Indigenous Technology of Power Quality Solution and Railways VCU solutions

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About:

- **STATCOM:** The Static Synchronous Compensator (STATCOM) based on PQ standard-IEEE519 & IEEE1459. The STATCOM technology has become increasingly relevant in recent years due to the growing demand for renewable energy sources such as wind and solar power, which are intermittent and variable in nature. The integration of these sources into the power grid can cause voltage fluctuations and instability, which can be mitigated by using STATCOMs. This Technology of STATCOMs developed by C-DAC, Thiruvananthapuram was transferred Trinity Energy Solution
- **VCU:** The VCU based on the Standard IEC-61375. The technology was based on TCN protocols available during early 2010s. Since then various enhancements have come up in TCN protocol. Further, it has been felt that there was a need to upgrade the VCU at par with contemporary technology. The existing C-DAC-VCU in terms of hardware and software and to handhold the technology for 5 years while in-house capacity is built at

CLW to tackle the day-to-day and long term maintenance requirement of locomotive fleet. This Technology of VCU developed by C-DAC, Thiruvananthapuram was transferred CLW Chittaranjan.

- **Loco Simulation Controller:** The Loco Simulation Controller is based on the Railways standard. The VCU and its application software needs to be tested in locomotive to better debugging, understanding the response of the outputs given from VCU to various sub-systems of locomotives. This test platform could simulate the actual functionalities of locomotive and will be giving inputs to VCU as per actual locomotive logic. Similarly, it also takes inputs from VCU and processes it and generates outputs as of actual locomotive to VCU. This Technology of Loco Simulation Controller developed by C-DAC, Thiruvananthapuram was transferred to CG Power & Industrial solution.
- **Rolling Stack Software:** The Rolling Stack Software is as per the requirement of Indian Railways. The rolling stock application that controls the loco function is distributed among the 4 processors boards in the VCU set. So as to make the loco operation more reliable in case of processor board failures, the important functions are implemented redundantly. This will also help the loco pilot to steer the train without moving from the driving cab to rear cab to address the failure. This software of Rolling Stack Software developed by C-DAC, Thiruvananthapuram was transferred to CG Power & Industrial Solutions.
- **Off-Loco VCU Test Kit:** The Off-Loco VCU Test kit is as per the necessity of Indian Railways. The PCB test jig is used to verify the basic functions of the sub-system PCBs that are being used in C-DAC developed VCU for 3 phase electric locos. The OK/ Not OK status of VC MeitY U subsystem PCBs under test is used for screening the PCBs for use in VCUs. This technology of Off-Loco VCU Test Kit developed by C-DAC, Thiruvananthapuram was transferred to Electrical Loco shed, Rayapuram Southern Railway.

Q1) Why is it called a locomotive?

The word locomotive originates from the Latin loco 'from a place', ablative of locus 'place', and the Medieval Latin motivus 'causing motion', and is a shortened form of the term locomotive engine, which was first used in 1814 to distinguish between self-propelled and stationary steam engines.

Source: C-DAC Transfer of Technology of Power quality solution for Grid and Electronics Solutions for Railways

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