QUVIR: ELECTRIC FAULT CONDITION INSPECTION AND QUANTIFICATION FOR POWERLINES

Polluted or broken insulators and faulty connections on power lines induce corona (arcing) and thermal (heat) radiation. The corona and heat build-up causes long-term degradation of the high-voltage electrical components, which leads to voltage drops, tripping and, eventually, a complete power line outage. These power outages have negative consequences for the local industry and the economy.

A phenomenon known as corona manifests itself in the ultraviolet (UV) spectrum, causing degradation of the high-voltage transmission line (HVTL) and sub-station components. Hence, the corona must be detected, and the faulty components identified to resolve the source of the problem. HVTL components can also overheat and subsequently fail, if either of these two problems persists, causing the supply of electricity to crucial infrastructure to cease.

BBecause both corona and overheating of HVTL components cannot be seen by the naked eye, a device that can make this corona and overheating visible was required. As such, the CSIR developed a device known as the Quantified Ultraviolet and Infrared (QUVIR) system, which is used to detect, recognise, and identify faults on HVTL. Moreover, the real value of the QUVIR lies in quantifying the corona and infrared radiation received from the source.

QUVIR captures the light energy in the three wavelength bands, visible, UV, and infrared, and makes this available to the system operator to decide the appropriate course of action.



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