

Optasense® Distributed Acoustic Sensing (DAS) Systems for the power network

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OptaSense® DAS is a proven method for detecting any activity in the vicinity of an asset over long distances. OptaSense® DAS converts the existing fibre optic cables into an array of virtual microphones with no infield equipment. An operator is able to hear, detect, classify and locate any breakdown or threatening events near to the assets in real time.

In today's increasingly competitive environment, Network operators must optimise the efficiency of the grid and maximise the lifetime of assets and it is essential to understand the condition of the network at every point. Achieving and delivering power demands requires an absolute certainty about what is really happening in the asset, because the integrity of the network is only as robust as the weakest point.

Fibre Optic Sensing has been used in power networks for a number of years to detect hotspots and help operators maximise the use of their power cable asset through the use of Distributed Temperature Sensing (DTS). The advent of Distributed Acoustic Sensing (DAS) now allows the operator to hear and feel what is happening within and around the cable.

OptaSense® DAS has been used in the Oil & Gas industry for a number of years. Many of the applications deployed are also relevant within the power networks. DAS system use Coherent OTDR (C-OTDR) technology. The principal of data acquisition is similar to DTS but uses Rayleigh backscatter light in order to monitor vibrations along the entire length of the cable. This technique allows us to use the optical fibre as an array of virtual microphones.

This paper discusses the application of OptaSense® DAS within the power network to monitor such as; Third Party Interference, short-circuit detection and localisation, circuit-breaker monitoring, transformer, cable and insulator condition monitoring, as well as the potential to detect the early signs of partial discharge.