

Introduction to Electrical Technical Discussions

TechTalk's are to be used in the electrical field to assist engineers with the latest technologies available to add to technical solutions.

The origin of Electrical engineering

Electrical engineering dates back to the late 19th century. It is that branch of engineering that deals with the technology of electricity, electronic components and electromagnetism. Electrical engineers work on a wide range of components, devices and systems, from tiny microchips to huge power station generators. Some of the most famous personalities in electrical engineering include Thomas Edison known for the invention of the electric light bulb, George Westinghouse known for the invention of alternating current, Nikola Tesla known for the invention of a simple induction motor, Guglielmo Marconi known for the invention of radio and Philo T. Farnsworth known for the invention of a television.

Power engineering and devices

Power engineering deals with the generation, transmission and distribution of electricity as well as the design of a range of related devices. These include transformers, electric generators, electric motors and power electronics. In many regions of the world, governments maintain an electrical network called a power grid that connects a variety of generators together with users of their energy. Engineers may work on the design and maintenance of the power grid as well as the power systems that connect to it. Such systems are called on-grid power systems and may supply the grid with additional power, draw power from the grid or do both. Power engineers may also work on systems that do not connect to the grid, called off-grid power systems, which in some cases are preferable to on-grid systems

TechTalks

The main focus of Martec is to enhance reliability and add solutions to the clients through these engineering technical discussion and reliability solution documentation. These documents are designed to fit on a single page and is an overview and a guide for electrical engineers. The main objective of these technical documents is to be used in the electrical field to assist engineers with the latest technologies available to add to technical solutions.

**Are you ready for
“End to End Solutions”
to improve
Safety and Reliability?**

Key challenges

Visual inspection is valuable, but insufficient for a comprehensive condition assessment of most items of electrical plant and equipment. In conducting a visual inspection, visible defects are evident, but many defects remain unseen because they are hidden below the surface or out of sight. Additionally, in many instances it is not possible to take the asset out of service and assessments must be conducted on-line.

Therefore, it is best to combine visual investigation with objective, systematic engineering processes including on-line condition assessments.

It must also be noted that an untrained eye can miss small critical defects that could turn into failure.

There are two primary causes of failure of power electrical equipment:

- viz. overheating or
- insulation breakdown.

Partial discharge is both a leading cause and indicator of insulation failure, so is particularly valuable for condition monitoring.

The objective is to identify defects before they can turn into failures. By implementing In-Time condition assessment methods, the reliability of the task is greatly enhanced. Risk levels can be assigned to all the critical electrical components within the power circuits. Understanding and identifying the high risk components within the electrical system will provide information to permit timely replacement or corrective action to prevent unwanted and costly failures during production.