

# EMT Analysis

## **Objective:**

The objective of the course is to provide users of Powerfactory with the relevant knowledge to effectively utilise the EMT function.

Users will be taught how to perform time domain simulations of electromagnetic phenomena.

## **Pre-requisites:**

- **MUST have attended the PowerFactory Basic course.**
- A good working knowledge of the basic techniques used in PowerFactory.

**No of participants:** Minimum: 6; Maximum: 12

**Cost:** see [www.digsilent.co.za](http://www.digsilent.co.za) for latest course fees, which includes a set of course notes, lunch and refreshments.

Computers and PowerFactory licences are also supplied.

Please note the booking clauses on the registration form.

**Duration:** 3 days

**CPD Points:** 3

## **Topics to be covered:**

### **Handling of Time Domain Simulations in PF**

- Initialisation, Event Definition, Result Visualisation, Plots
- Fast Fourier Transform

### **Transformer Energization Transients**

- Non-linear magnetizing inductance.
- Saturation curves.
- Residual flux
- Harmonic content of inrush currents

### **Capacitor Switching**

- Closing Operations:
  - Inrush currents
  - Back-to-Back Connections
  - Mitigation of inrush currents
- Capacitor bank opening
  - Transient recovery voltage at circuit breakers

### **Switching Transients**

- Overhead line modelling:
  - Frequency dependent parameters
  - Lumped vs. distributed parameter model
- Surge arresters:
  - Protection characteristic
  - Energy stress
- Line energization
- Stochastic analysis of switching overvoltages

### **Lightning Transients**

- Modelling guidelines
- Impulse sources
- Direct lightning strokes.
- Insulator Flashover. Back flashovers.