PowerFactory Intermediate

Course Content

Digsilent Buyisa (Pty) Ltd

POWER SYSTEM SOLUTIONS
MADE IN GERMANY

PowerFactory Intermediate

2 Day Course

Objective:
To provide users working within the planning and operations environment and who are familiar with PowerFactory basic techniques, with additional tools and knowledge of the program. This course covers a broad range of subjects and will be useful to all users wanting to utilise PowerFactory for detailed analysis of power systems. It will also provide the user with the knowledge of built-in tools that will simplify and enhance the analysis of simulated networks.

Pre-requisites:
- **MUST have attended the PowerFactory Basic Course**
- A good working knowledge of the basic techniques used in PowerFactory.

No of participants:
In-house at Customer premises: Minimum: 6; Maximum: 12.
At Digsilent Buyisa Training Centre: Minimum: 10; Maximum: 16.
Online: Minimum 6; Maximum: 16.

ECSA CPD Accredited and Points:
- The course is fully accredited with the Engineering Council of South Africa (ECSA).
- 2 CPD points for completion.

Who Should Attend:
The course is intended for;
- Utility engineers
- Power system operators
- Project Developers
- Manufacturers
- Consultants and electrical engineers

DIGSILENT BUYISA

Digsilent Buyisa
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Price per participant:

- For course pricing, kindly visit our website at: https://digsilent.co.za/training-courses/
- For in house prices at customer premises: contact Digsilent for a quote via email info@digsilent.co.za or Telephonically (+27) 087 351 6159.

  - ❖ Prices are exclusive of VAT.
  - ❖ Please note that cost excludes your Company's internal administrative costs.
  - ❖ All prices may change without prior notice - please contact Digsilent Buyisa for the latest prices before booking.
  - ❖ **DISCOUNT** is offered if a company sends more than one delegate per course.
  - ❖ Trainings held at Digsilent Buyisa Training Centre includes light breakfast snack, lunch and refreshments.

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Training schedule

DAY 1

08:30 **Data Management Part 1**
Introduction to the Data Management tool which gives an overview over the complete data base as well as detailed information about the parameters of single power system elements or other objects.

Exercise 1.1: Filters
Searching, sorting and creating filters in the network model manager and Data manager.

Exercise 1.2: Data Extensions
Creating and using new data extensions

10:30 **Tea/Coffee break**

11:00 **Data Management Part 2**
Introduction to Network Data Elements, such as Zones, Areas, Owners, Operators and Boundaries. Demonstration of Operation Scenario Manager, Variation Manager and Study Case Manager.

Exercise 1.3: Zones and Areas
How to define and work with Zone and Area elements in PowerFactory.

Exercise 1.4: Boundaries
How to define and work with Boundaries using the Boundary Definition Tool in PowerFactory.

12:00 **Operational Library**
Introduction to the operational library which is used to store and organise operational data or applications to a number of elements.

Exercise 2: Thermal Ratings
Defining thermal rating objects. Thermal rating objects allow the definition of post-fault operational ratings for certain branch elements, depending on the fault duration and the loading prior to the fault.

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Exercise 3: Q Limit Curves
Defining capability curves for generators. Capability curve objects allow different minimum / maximum values of reactive power to be considered at different levels of active power injection.

12:30 **Lunch break**

13:30 **Compare And Merging Projects**
The compare and merge tool in PowerFactory is demonstrated to show participants hoe to merge two or more projects into a single project casefile from different users.

14:00 **Parameter Characteristics**
Introduction of parameter characteristics that can be selected by date and time or custom triggers.

Exercise 4.1: Discrete Time Characteristics
Defining a time characteristic

Exercise 4.2 Discrete Characteristics
Defining one-dimensional-vector load characteristics and triggers.

15:00 **Tea/Coffee break**

15:30 **Exercise 4.3: Matrix Characteristics**
Defining matrix characteristics which are based on two variables.

Exercise 4.4 Parameter Characteristic files
Defining and setting up a parameter characteristic from an external file.

Exercise 4.5: Browse in Characteristics Mode
Exploring the characteristics tab, to check and edit the characteristic for whole classes of objects.

16:30 **End of the first day**

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DAY 2

08:30 **Quasi-Dynamic Simulation**
Introduction to a dedicated time varying load flow calculation tool and plotting results.

Exercise 5.1: Load and Generation Profiles
Defining and setting up load and generation profiles.

09:00 **Exercise 5.2: Executing a Quasi-Dynamic Simulation**
Performing a time sweep of load flow calculations for a given interval.

Exercise 5.3: Visualising Results
Plot the results for the period specified.

10:30 **Tea/Coffee break**

11:00 **Feeders and Feeder Load Scaling**
Introduction to Feeder definitions in PowerFactory.

Exercise 6.1: Feeders and Feeder Load Scaling
Defining and setting up a feeder. Scaling a feeder to match a known feeder power or current and viewing the voltage profile for the feeder.

Exercise 6.2: Feeders and Feeder Load Scaling
Defining and setting up a feeder within a feeder.

12:30 **Lunch break**

13:30 **Contingency Analysis**
An overview of contingency analysis that can be used to determine power transfer margins and identify risks of changing load conditions.

Exercise 7.1: Defining Contingency Events
Defining fault cases and groups

14:00 **Exercise 7.2: Execute Contingency Analysis**
Performing a contingency analysis.

Exercise 7.3: Analysing Contingency Results
Analysing and interpreting contingency results

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15:00	**Tea/Coffee break**
15:30	**Transmission Network Tools** Analysing the voltage stability of power systems and plotting results. PV and QV curves are essential for analysing the voltage stability of power systems. **Exercise 8.1: PV Curves** Execute PV Curves Calculation and identify the critical busbar. **Exercise 8.2: QV Curves** Execute QV Curves Calculation and identify the critical busbar.
16:15	**Exporting PowerFactory Projects** Exporting project files (.pfd, .dz) using the snapshot export (.dzs), data with external files (.pfdx) and to older versions.
16:30	**End of the second day**

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