



POWERFACTORY

Energy Storage Analysis

Course Content

Digsilent Buyisa (Pty) Ltd

Energy Storage Analysis

1 Day Course

Objective:

The objective of the course is to provide users of PowerFactory with the relevant knowledge to effectively analyse energy storage systems and their integration into the electrical networks.

NOTE: The models and examples used in the course in the course are generic a do not represent any specific manufacturer or technology.

Pre-requisites:

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

No of participants:

At Customer specified 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).
- 1 CPD point for completion.

Who Should Attend:

The course is intended for;

- Planning, operations and maintenance engineers and technicians
- Power system operators
- Project Developers
- Manufacturers
- Consultants



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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 @ customer premises: contact Digsilent for a quote via email info@digsilent.co.za or Telephonically (+27) 087 351 6159.
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- ❖ 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.

Training schedule

DAY 1

08:30

Energy Storage Systems

Theoretical background, Types, applications, comparisons of types of storage, components of battery systems, performance indicators, battery management system.

Exercise 1: Load Flow Analysis

Modelling the BESS, Assess impact of BESS on feeder voltage profile

Short circuit Analysis

Overview of Short circuit analysis calculation methods

Exercise 2: Short Circuit Analysis

Determine the BESS fault level current contribution.

10:30

Tea/Coffee break

11:00

Parameter Characteristics

Overview of parameter characteristics that can be selected by date and time or custom triggers

12:30

Exercise 3: Characteristics (Time based load flow)

Defining a time characteristic for the BESS, PV plant and loads and running a time-based load flow analysis.

13:30

Quasi-Dynamic Simulation (QDSL)

Using QDSL for time varying load flow calculations, analysing and plotting the results

Exercise 4: Quasi-Dynamic Simulation

Running a Quasi-Dynamic simulation

14:30

QDSL Models

Introduction to QDSL models. QDSL model type initialisation, load flow equations, load flow control and Quasi-Dynamic simulation. Creating a QDSL model element, procedure and setup for time-dependent states.



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Exercise 5: QDSL Models

Load flow analysis of PV farm using operation scenarios

15:00 **Tea/Coffee break**

16:00 **Power Quality Assessment**

Fundamentals. Harmonic Load flow according to IEC 61000-3-6. Overview of the calculation procedure. Definition of harmonic sources in PowerFactory. Voltage flicker assessment according to IEC 61400-21. Power Quality Grid code requirements.

16:30 **End of Training**