

- TRAININGS CATALOG -
- ELECTRICITY FIELD -



Reliability and Sizing of Equipment and Networks
Adapted trainings in High and Low Voltage
Evaluation of electrician personnel
Electrical certification



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EXPASSESS COMMITMENT

Because electricity is essential for the future, ExpRAssess supports you in the technical control of your networks.



Your Solution for Adapted Training:

The commitment of ExpRAssess is the **operation** and **reliability** of **electrical networks**, ensuring the **safety** of **people** and **equipment**.

That is why we propose solutions for **adapted trainings** to electricians and non-electricians:

- Design of electrical installations high and low voltage,
- Operation and Maintenance of electrical high and low voltage,
- Reliability of distribution networks: choice and sizing of protections,
- Notions on harmonic pollution, compensation of reactive energy,
- Implementation of generator sets, inverters and variable speed drives.

ExpRAssess can also support you in the **development** of an adapted **training plan** through a **skills assessment**:

- Monitoring and transfer of skills for the personnel responsible for the design or maintenance of the installations,
- Assessment of the technical skills of maintenance personnel with a view to ensuring their adaptation to the position occupied, their development possibilities and the possible need for training,
- Assistance in the development of a staff training plan.



RELIABILITY OF ELECTRICAL NETWORKS: ARCHITECTURES, CHOICE OF COMPONENTS & PROTECTIONS

<u>Type:</u>	<u>Duration:</u>	<u>Price:</u>	<u>Split:</u>	<u>Field:</u>
Face-to-face	2 days	On demand	75% Class 25% Case study	Electricity

Goal:

Know the architectures of high and low voltage electrical networks as well as the components intended for network security.

Persons concerned:

Electrician staff for study, operation, and maintenance.

Pre-requisite:

Basic knowledge of electrical networks.

Number of participants:

6 trainees maximum

Animation:

By engineers also providing technical assistance services to companies.

Location:

To be agreed.

Training method:

Theoretical training based on practical examples and exercises.

Training support.

Case study.

Content:

Advantages and limits of HV distribution systems: radial, loop and double radial.

Distribution by double busducts and bridge busduct.

Description of recommended operating modes. The risks associated with inadequate configuration.

Choice criteria's for neutral earthing systems.

Emergency sets: principle and coupling modes.

Solar, Wind and Hydroelectric Power Plants: pros and cons.

Uninterruptible Power Supply (UPS).

Redundancy and sources permutations: principles, eventual risks, settings.

Main electrical networks protections, notions of selectivity and protection plan. Case of generators.

Examples of electrical networks architecture with several voltage levels HV/MV/LV and several sources.

Case study according to specific needs description.

SIZING OF ELECTRICAL INSTALLATIONS

<u>Type:</u> Face-to-face	<u>Duration:</u> 2 days	<u>Price:</u> On demand	<u>Split:</u> 75% Class 25% Case study	<u>Field:</u> Electricity
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Goal:

Know how to choose the components of an electrical network to meet assessed needs.

Persons concerned:

Electrician staff for study, operation, and maintenance.

Pre-requisite:

Basic knowledge of electrical networks.

Number of participants:

6 trainees maximum

Animation:

By engineers also providing technical assistance services to companies.

Location:

To be agreed.

Training method:

Theoretical training based on practical examples and exercises.

Training support.

Case study.

Content:

Assessment of needs and power transits.

Choice criteria for power transformers, generators and Uninterruptible Power Supply (UPS).

Cables sizing criteria's.

Installation heating in permanent mode and in short-circuit mode.

Voltage drops and line losses.

Calculations of HV cables section according to the standard NFC13-200.

Calculations of LV cables section according to the standard NFC15-100.

Notions of neutral earthing systems.

Sizing of protection conductors and of earthing network.

Case study according to specific needs description.

PROTECTIONS OF ELECTRICAL NETWORKS

<u>Type:</u> Face-to-face	<u>Duration:</u> 2 days	<u>Price:</u> On demand	<u>Split:</u> 75% Class 25% Case study	<u>Field:</u> Electricity
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Goal:

Know the protections for electrical installations and their settings' choice criteria's.

Persons concerned:

Electrician staff for study, operation, and maintenance.

Pre-requisite:

Basic knowledge of electrical networks.

Number of participants:

6 trainees maximum

Animation:

By engineers also providing technical assistance services to companies.

Location:

To be agreed.

Training method:

Theoretical training based on practical examples and exercises.

Training support.

Case study.

Content:

Overload and short circuits.

Earth faults in the various earthing schemes.

Incidents linked with voltage and frequency.

Protections, ANSI codifications and technologies.

Current and voltage transformers: technology, usage limits, choice.

Transformers and motors inrush currents.

Phases over-current and earth faults protections setting limits. Case of installations fed by several sources.

Current threshold and timer delay selectivity rules.

Transformers, motors and alternators protections.

Case study for the development of a protection plan.

REACTIVE ENERGY COMPENSATION: GOALS, SIZING, RISKS AND SOLUTIONS

<u>Type:</u> Face-to-face	<u>Duration:</u> 1 day	<u>Price:</u> On demand	<u>Split:</u> 75% Class 25% Case study	<u>Field:</u> Electricity
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Goal:

Understand the interest of reactive energy compensation, know how to choose a device that meets needs.
Know the rules for operation and maintenance to avoid risks.

Persons concerned:

Electrician staff for study, operation, and maintenance.

Pre-requisite:

Basic knowledge of electrical networks.

Number of participants:

6 trainees maximum

Animation:

By engineers also providing technical assistance services to companies.

Location:

To be agreed.

Training method:

Theoretical training based on practical examples and exercises.

Training support.

Case study.

Content:

Reminders on active, reactive and apparent powers and energies.

Interests and rules related to the limitation of reactive energy in electrical networks.

Production of reactive energy: alternator and capacitor bank.

Capacitor banks sizing.

Power factor regulation.

Risks linked with harmonics and operation with emergency generator set.

Recommendations for installation, operation and maintenance.

Compensation of HV networks, wind / solar power plant, asynchronous generators.

Case study.

HARMONICS IN ELECTRICAL NETWORKS: ORIGINS, DISTURBANCES AND REMEDIES

<u>Type:</u> Face-to-face	<u>Duration:</u> 2 days	<u>Price:</u> On demand	<u>Split:</u> 75% Class 25% Case study	<u>Field:</u> Electricity
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Goal:

Understand harmonic phenomena and know the remedies.

Persons concerned:

Electrician staff for study, operation, and maintenance.

Pre-requisite:

Basic knowledge of electrical networks.

Number of participants:

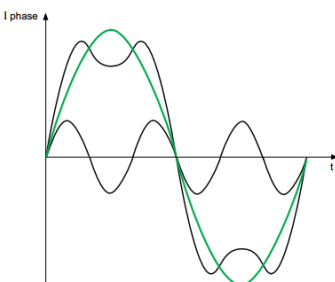
6 trainees maximum

Animation:

By engineers also providing technical assistance services to companies.

Location:

To be agreed.



Training method:

Theoretical training based on practical examples and exercises.

Training support.

Case study.

Content:

Characteristics of electrical networks, notions of resistance, reactance and impedance.

Linear loads.

Distorting loads: examples, current waveforms.

Fourier series decomposition: harmonic ranks, overall distortion rate.

Current and voltage distortions.

Disturbances effects: overheating, deterioration, malfunction.

Acceptable limits values.

Cables sizing.

Capacitor bank protections.

Case study.

ELECTRICAL QUALIFICATION OF PERSONNEL ACCORDING TO THE STANDARD NFC 18-510

Type: Remote or Face-to-face	Duration: 1 to 3 days	Price: On demand	Split: 75% Class 25% Practice	Field: Electricity
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Goal:

Carry out safely operations or work on electrical installations or in their vicinity.

Persons concerned:

Staff working on or near electrical installations.

Pre-requisite:

For non-electrician staff: No pre-requisite.

For electrician staff: Basic knowledge.

Number of participants:

10 trainees maximum

Animation:

By engineers also providing technical assistance services to companies.

Location:

To be agreed.

Training method:

Theoretical training based on practical examples and exercises.

Practical part for application of the concepts addressed in theory.

Training support and tests on theoretical and practical knowledge.

Content and duration:

The content of theoretical and practical trainings is in conformity with the rules defined in NFC18-510 standard. It is adapted:

- In accordance with the type of works and operations performed by the staff,
- For a first certification or a recycling.

Contact us to define – according to your needs – the adapted content and duration in conformity with the NFC18-510 standard rules.

Certificates:

At the end of the training, a certificate is issued for each trainee describing – depending on their results – the maximum level of electrical clearance recommended.



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