Technical training in Electrical Distribution

Global catalog
Editorial

In times of crisis, when budgets are limited and the efficiency of your installation is key, how can you leverage your performance?

Training is one of your solutions

Building on talents

Today, expertise is usually gained after years of experience on the job, with a significantly long period from the date of hire to useful productivity. Improving and educating our workforce is everyone’s responsibility. At Schneider Electric we are committed to providing you with comprehensive knowledge of our product that you can immediately apply in your workplace or institution.
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Empower your team

When the efficiency of your installation is key, training is one of the logical solutions to leverage your performance, thus increasing the competencies of your company’s personnel.

Discover our training offering, from e-Learning to Competence Management.
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Trainees from +90 countries

→ +20 training facilities in Electrical Distribution on full-size equipment

→ 4,000 active e-Learning trainees registered
Dedicated training teams close to you

A complete range of courses with

4 different modes:
- distance learning: e-Learning modules
- face-to-face exchange: class-room sessions
- practical skills: hands-on training
- an innovative mode: 3D training

+70 training programs in Electrical Distribution are available on:
- Safety & Risk Prevention
- Technical fundamentals
- Operation & Maintenance

and tailored courses

Please feel free to contact us:

global-infrastructure-training@schneider-electric.com
The Technical Institute training offer

Technical training in Electrical Distribution

Our customers expect us to provide training that takes into account their environment, their specific characteristics and their regulations. It is a real challenge to strike a balance between theory, practical application and the right level of technical information to offer training that is adapted to day-to-day requirements. Schneider Electric uses its internationally renowned expertise in design, installation and maintenance, including training experience that has proven its worth for many years now.

70 programs

on Safety & Risk Prevention, Fundamentals, Operation & Maintenance

> Training on full-size equipment
> Dedicated training centers
> Experienced instructors, experts in technical & educational fields.

Customer benefits

- Optimize your team’s competencies
- Enhance the performance of your electrical installations.

Demo access... www.e-learning-access.schneider-electric.com
Instant return on investment

The effectiveness of training is measured in terms of staff operational performance in their day-to-day work. The practical part of our training programs is based on hands-on applications that enable participants to make immediate use of their newly acquired knowledge, know-how and skills when they return to their jobs.

Some modules can be followed at a distance, without any travel expense attached. This e-Learning solution is accessible online, anywhere in the world, via the Internet.

Expert instructors who make the difference

Schneider Electric instructors are all experienced in their areas.

In addition they know how to teach. Their expertise is completed with a solid experience in the field, allowing them to be in close contact with trainee concerns and preoccupations.

Training for each specific need

You may be in the public sector or industry, a novice or very experienced in electrical installations. You could be looking for training in electrical safety, installation design, or operation and maintenance. Whatever your situation, Schneider Electric Technical Institute has a training course to meet your needs among the 70 standard programs listed in this global catalogue, or in the country catalogues.

Individuals can register for one or more courses, to participate in an open, blended training course, taught on our premises on set dates.

These courses are modular, which means they are perfectly adaptable to your company’s own training program. However, when a same company, or department, registers a group of people, we suggest you take a tailored course.

This enables us to organize a customized program taught either in our premises or yours (requiring that equipment be de-energized) on the date of your choice.

Schneider Electric Technical Institute also offers qualifying training as part of a Competence Management process (see pages 18 - 19).

Customers testimonies

“I compared the cost of the course with the costs induced by insufficient competences: failures, production down time, waste of time, impact on corporate image, etc. I needed no further convincing.”

“The instructors are not only good at explaining, but also aware of what really happens in the field. This means that their courses are so practical that I was immediately operational at the end.”

“Thanks to the equipment and simulation models, we were able to recreate our actual operating environment. I could test and use, and even make a mistake, safely! These are ideal ways to gain new competencies.”

“I came to learn about new methods in my job. Although I already knew the actions, I could not really set them in order. This course also reminded me of electrical risks, and now I’m able to avoid them and work in safety.”
Schneider Electric Technical Institute offers a suite of courses adapted to each single and specific need. Over 70 programs are available on Safety & Risk Prevention, Technical fundamentals and Operation & Maintenance.

Sessions can be either conducted in our dedicated training centers or on your own premises, based on different modes:

### For distance learning
- **e-Learning modules**
  - Learn what you need, at your own pace.
  - e-Learning is one great solution to train on a specific technical topic your remote teams located all around the globe and allow them to optimize their training time.
  - Schneider Electric has adopted the blended teaching approach, combining e-Learning programs and face-to-face training to gain from the richness of their complementary benefits.

### For Face-to-face exchange
- **Class-room sessions**
  - Benefit of the experienced knowledge of our trainers in technical fundamentals topics.
  - From generic topics as electrical basis to design installation, including cybersecurity and power system protection.

### For practical skills
- **Hands-on training**
  - Attend specialised workshops on full-size equipment delivered by our technical expert trainers.
  - These courses have a limited number of attendees to ensure they get the most out of the hands-on training and to practice.
  - This is perfectly suitable to learn as in your daily activity parameters, to apply easily what you’ve learned when you get back to work.

### For an innovative mode
- **3D training**
  - Discover a new training mode to learn differently thanks to the 3D real-time training modules.
  - Take benefits of the 3D immersive technology, different to the 3D passive technology like in cinema, to do what you can’t do in reality!
  - Go inside the equipment as if you were a molecule, learn with interactive exercises on troubleshooting, handle and dismantle the product fully (yes)! Let’s fly!

The training programs are available as per the catalog but can be customized on request. Please feel free to contact us for your specific requests.
Competence Management

The full-customized training solution for your specific needs

Do you need to increase the competence level of your team?
Do you have a new product or solution to implement for which your team needs new skills?
Do you need a very specific and custom training path?

Our top-of-the-line training program, Competence Management, is made for you. It covers such areas as safety, networks, MV, transformers or automation protection relays. This extremely in-depth program is designed to train people to the highest skill level. It also serves to boost employees’ career development programs, leading them to become certified technical leaders.

How it works

Analyzing
- Needs analysis
- Knowledge evaluation
  To evaluate trainees’ knowledge level.

Preparing
- Course design
- e-Learning
- Planning
  To optimize the course.

It starts with an assessment of existing skills, to determine the trainees’ knowledge level and scale the adaptation of the training modules. If there is a great difference in the basic knowledge of the trainees, training can be split into different levels.

Next, the training program is prepared: selection of the appropriate course materials, adaptation, if necessary, to the specific customer needs and even the creation of new course material to fit your company needs. Once the content and schedule are agreed, training can start. Generally, this will start with e-Learning modules to give a common core of fundamental knowledge.

Then the training continues with class-rooms session and hands-on courses.
They can be conducted in our different training centers, depending on the equipment required for practical work and your wishes. The training also includes interspersed assessments to evaluate the participants’ progress and their achievement of objectives.

Part of the training path takes place at the customer’s site. This gives the trainees the opportunity to learn and practice on their own equipment and in their own working environment.

The Competence Management training ends with a final assessment.
This reflects the progress made by the participants and the achievement of the program objectives.

The Competence Certificate will be delivered to the participant only after successful completion of the program and the final assessment.
This document is not just an attendance certificate, but a real Competence Certificate that guarantees the trainee has acquired the skills required.
Teaching
Learning & Training
Application at customer’s site
To learn required skills.

Qualifying
Evaluation quiz
Knowledge validation
To check knowledge acquisition and deliver a competence certificate.

In a nutshell
We will design the ideal training path to fit your specific requirement, from among our large training offering, with adaptation training materials and with the creation of new dedicated courses.
This blended training will join e-Learning, class-rooms sessions, practical work and why not 3D training. We offer you trainee knowledge acquisition with an assessment of your trainees’ knowledge level before, during and after the training.

Competence management is the highest added value training!
e-Learning
Learn what you need at your own pace

Our e-Learning solution offers you a flexible distance course, perfectly suited to training your remote teams located all around the globe and allow them to optimize their training time. Our e-Learning programs cover topics related to transmissions and distribution and electrical risk prevention.

Programs can be customized according to the needs and the schedule constraints of trainees. e-Learning offers a simple self-teaching solution in a matter of hours (4 to 5 hours) in a specific technical topic. To refresh your knowledge or to boost your competences, e-Learning is a great solution for responding effectively and instantly to each trainee's expectations.

True challenges for managers ...

- Build your program according to the context, the strategy and the needs of your company.
- Define adapted learning paths for your team members.
- Allow trainees to go further with the tutoring option.
- Train remote teams located worldwide.
- Bring employees' knowledge to a common basic level.

... Concrete benefits for e-Learners

Trainees who will benefit from the e-Learning program can:

- Learn what they need, whenever they want, and at their own pace.
- Assess their knowledge (self-audit).
- Customize the learning path and choose their contents according to the self-audit results.
- Measure their improvement and get their certificate at completion of the course.
- Keep in touch with what happens on the field (e.g. pragmatic contents, feedbacks from the field).
- Have a permanent access to a referent tool: to deepen their skills, ask a question, solve a problem, etc.

Customer benefits:

- Eliminate geographical barriers
- Optimize training costs and resources
- Interactive contents: exercises, quizzes, animations, videos, etc.
- Self-learning: trainees chose what and when they learn according to their interests, their skills level, and the time they decide to learn
- Continuous access to knowledge

+40 modules on technical topics designed by experts
Multiple ways of adapting the learning mode to the learner’s objectives

- **Stand-alone** (without training sessions)
- **As a classroom support** (e-Learning module is used as training support)
- **Blended with classroom sessions**
- **Blended with tutoring**

They e-Learned with Schneider Electric

- It gave me a better understanding of smart grids and their technical impacts.
- The ‘Electrical energy step by step’ training course helped me in a number of ways, including structuring the knowledge I already had and learning about transmission equipment.
- This is a very useful tool to resolve problems, such as if I want to check equipment compliance. I also use it to refresh my general knowledge on transmission and distribution.
- Honestly, the test and training of the Electrical Risk Prevention program are the best tools for my people to be sure they learn electrical safety rules. I like it.

Trainees from +90 countries

Access directly through the e-Learning platform:
www.e-learning-access.schneider-electric.com
A new training approach for a better performance

Our customers want to:
> Better understand our equipment and the way they fit within their network.
> Know how to react in case of an unexpected event.

This leads us to choose immersive 3D technology to meet your needs for some courses.

Discover your equipment and the way they fit within your network

Thanks to 3D visualization, you can simulate interaction between your equipment and your network. You can see what you can never actually see: interactive single-line diagram, inside parts, etc.

Discover how to react and the steps to take in case of an unforeseeable event

If there is a shut-down in your power plant, will you be able to troubleshoot safely and on time?

Thanks to immersive 3D you can:
> make operations you could not make in reality
> simulate events (trouble shooting, emergency situation)
> and perform practical operations as many times as you want, without any impact on your installation.

Immersive 3D is a complementary learning mode. It does not replace practical operations during classroom sessions.
It prepares them, improves them and adds great and new pedagogical values:
● Learners can test and discover the equipment at their own pace, manipulate, try operations and proceed by trial and error with the procedure.
● Many games are proposed to provide a better knowledge of the equipment.
● Events simulations are offered to make people understand the right way to operate.
Training with you

Throughout the lifecycle of your installation
and in all your activities
When people work in electrical environments, they are obliged to have full knowledge of safety rules to apply them. This is vital not only for workers but also for the safety of employees supervised.

Learn how to comply with environmental regulations on SF₆ also to take care of our planet!
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<tr>
<td>SF₆ Gas Recovery Regulation EC 842-2006 (for experienced personnel)</td>
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<tr>
<td>Handling of SF₆ gas and CF₄ gases according to IEC/TR 62271-303 technical report</td>
<td>M023TC</td>
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Matching your training needs

Electrical safety: objective "zero accident"

There are four requirements for working safely in an electrical environment:
- Be qualified in Electrical Safety
- Know the electrical installation
- Wear appropriate Personal Protective Equipment (PPE)
- Have a regular practice of electrical work.

The first two can be acquired through training and the last two are mandatory to reach the “zero accident” objective.

According to statistics from Health & Safety organizations, 80% of accidents are due to behavioral issues. With this in mind, Schneider Electric Technical Institute has developed a training methodology based on practicing on actual scale equipment to develop behavioral responses close to real-life situations. Every three years, a refresher course is recommended.

To reinforce your zero accident policy, our international safety experts have designed a specific e-Learning program to enable your teams to keep an optimum level of knowledge to prevent electrical risks: the e-Learning Electrical Risk Prevention program.

This interactive solution is specifically designed for international perspectives:
It summarizes most of the common international rules that will enable your teams to be operational anywhere in the world, at all times.

Safety in hazardous areas (ATEX)
Explosive atmospheres are a major risk to employees in hazardous areas. In order to preserve the health and safety of workers dealing with electrical equipment installed in these areas, companies should comply with three more obligations:
- Be qualified in ATEX
- Use ATEX certified equipment
- Have installations regularly audited and certified for this risk.

The first can be acquired through training, and the last two are, as well as for Electrical Safety, mandatory to reach the “zero accident” objective.

All training courses proposed in this Safety section are based on the instructors’ and trainees’ experiences as well as real-life studies. Trainees can acquire and increase their awareness of the correct behavioral attitude to adopt to minimize risks.

Environmental risk prevention
New environmental regulations are being implemented in an increasing number of countries, especially about SF₆ handling. We developed new courses to help you to comply with them.

We are ground-breakers in this field, in line with our ethical motto which is to be a green energy management leader!

Let’s take care of our planet!
Objectives
Refresh knowledge on the fundamentals of electrical risk.
Learn a minimum number of common international rules concerning electrical risk prevention.
Go through a quick and efficient self-assessment on these topics.

Course topics
- Module 1: Learn about electrical risk
- Module 2: Learn how to prevent electrical risk
- Module 3: Comply with safety procedures (to lock out - tag out)
  - Self-assessment
  - Various interactive learning activities
  - Summaries
  - Assessments are readily available but can be customized to your needs, upon request
  - Easy user navigation

Audience
- All persons and companies working in an environment with electrical risks
- Managers whose teams work in such environments
- Health & Safety Managers

Learning Path
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<td>Local authorization and qualification required to work on an electrical system</td>
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<td>F001AC</td>
</tr>
<tr>
<td></td>
<td></td>
<td>F002TC</td>
</tr>
<tr>
<td></td>
<td></td>
<td>F003TC</td>
</tr>
</tbody>
</table>

Customer Benefits
- Possibility of doing this training course on your own site and at your own convenience
- Exchanges with an experienced instructor
- Most of the common international rules are dealt with in this training
- Up-to-date contents according to current active regulations
- Designed by international safety experts
- Training accessible 24/7
Objectives

Acquire a basic knowledge of working with electricity, so that the trainees are aware of the dangers that they may encounter in an electrical environment.

Act and react according to the working environment.

Course topics

- Electricity and its benefits, use and dangers
- How do we protect ourselves against potential danger?
- Examples of accidents that have happened and how they could have been avoided
- The safety rules for electrical work
- Participant evaluation for certification

Audience

- Non-electricity specialist who has basic access to electricity sites

Duration

2 days
80% Theoretical
20% Practical

Price
Contact us

Dates & Place
Contact us

Learning Path

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<thead>
<tr>
<th>Prerequisites</th>
<th>Training</th>
<th>Next Step</th>
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<tbody>
<tr>
<td>No technical background required</td>
<td></td>
<td>F001AC</td>
</tr>
<tr>
<td></td>
<td></td>
<td>S001AC</td>
</tr>
</tbody>
</table>

Customer Benefits

- Possibility of doing this training course on your own site and at your own convenience
- Exchanges with an experienced instructor
- Half a day dedicated to practical work
- Participants will receive a certificate showing the electrical safety level they have achieved
Objectives
Work safely when carrying out Low Voltage electrical work such as installation and measurement.

Course topics
- Electricity and its benefits, use and dangers
- How do we protect ourselves against potential danger?
- Working with Low Voltage electrical safety: general instructions
- Practical simulation of potential dangers/accidents
- Testing Low Voltage electricity
- Participant evaluation for certification

Audience
- Workers who have a direct involvement in Low Voltage electrical work

Duration
- 3 days
- 70% Theoretical
- 30% Practical

Price
Contact us

Dates & Place
Contact us

Learning Path

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<thead>
<tr>
<th>Prerequisites</th>
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<th>Next Step</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic knowledge of electricity and LV electrical experience</td>
<td>F002TC</td>
<td>S001AC</td>
</tr>
</tbody>
</table>

Customer Benefits
- Possibility of doing this training course on your own site and at your own convenience
- Exchanges with an experienced instructor
- A day dedicated to practical work
- Role-play exercises demonstrating the importance of safe conduct
- Participants will receive a certificate showing the electrical safety level achieved
**Objectives**
Evaluate the danger of electricity. Execute some specific operations on Low Voltage & High Voltage installations in safe conditions.

**Course topics**
- Electricity and its benefits, use and dangers
- How do we protect ourselves against the potential danger?
- General instructions for working with Low, Medium and High Voltage electrical safety
- Practical simulation of potential dangers/accidents
- Testing electricity Low and Medium Voltage
- Participant evaluation for certification

**Audience**
- Electrical staff working in Low and High Voltage (non-managerial electrician and/or work supervisor and/or lockout supervisor and/or operation supervisor)

**Learning Path**

<table>
<thead>
<tr>
<th>Prerequisites</th>
<th>Training</th>
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<tbody>
<tr>
<td>Basic knowledge in electricity and LV, MV and HV electrical experience</td>
<td>F003TC</td>
<td>S001AC</td>
</tr>
</tbody>
</table>

**Customer Benefits**
- Possibility of doing this training course on your own site and at your own convenience
- Exchanges with an experienced instructor
- During the training session, interactivity between a small group of trainees allows the seamless evaluation of the trainees’ progression
- A day and a half dedicated to practical work
- Participants will receive a certificate showing the electrical safety level achieved

**Duration**
- 4 days
- 60% Theoretical
- 40% Practical

**Price**
Contact us

**Dates & Place**
Contact us
Objectives

Gain or increase knowledge required for the design, achievement and maintenance of electrical and mechanical installations (equipment) in (ATEX) potentially Explosive Atmospheres, according to the required standards.

Ensure that equipment repair does not downgrade its safety level.

Provide traceability of repairs.

Course topics

- The Explosive Atmosphere (ATEX) approach
- Generalities on Explosive Atmospheres (ATEX), Gas and Dust
- The mechanism of an explosion
- Comparison between different applicable standards (IECEx, CENELEC, NEC500 and 505)
- Exploding risk area Classification (Gas and Dust)
- The different types of protection for electrical ATEX equipment (d, m, ia, ib, etc.)
- The different types of protection for mechanical ATEX equipment (d, c, k, etc.)
- Equipment marking
- Incidences for use and maintenance
- Intervention in ATEX Hazardous Areas
- Initial Assessment by questionnaire
- Exercises (marking plate of the equipment reading, appropriateness (suitability) of the equipment, initial Assessment by questionnaire)

Audience

- Persons supervising installation, operation or maintenance on a hazardous area installation concerned by the risks of Explosive Atmosphere (ATEX), under supervision

Learning Path

<table>
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<tr>
<th>Prerequisites</th>
<th>Training</th>
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<tbody>
<tr>
<td>Electrical and mechanical fundamentals</td>
<td>F004TC</td>
<td></td>
</tr>
</tbody>
</table>

Customer Benefits

- Possibility of doing this training course on your own site and at your own convenience
- Exchanges with an experienced instructor
- Theoretical training and exercises with an INERIS* certified instructor
- Exchange of experience and acquiring the right behavior
- Evaluation by questionnaire, and Competence certificate issued by INERIS

* INERIS: French National Institute for Industrial and Environmental Risk
Objectives
Gain or increase knowledge required for the design, achievement and maintenance of electrical and mechanical installations (equipment) in (ATEX) potentially Explosive Atmospheres, according to the required standards.

Ensure the ATEX safety welcoming at site.
Ensure that equipment repair does not downgrade its safety level.
Make all operators aware of their responsibilities.
Supervise workers in an explosive atmosphere, and ensure the traceability of repairs.
Issue the permit to work in an explosive atmosphere.

Course topics
- The Explosive Atmosphere (ATEX) approach
- Generalities on Explosive Atmospheres (ATEX), Gas and Dust
- The mechanism of an explosion
- Comparison between different applicable standards (IECEx, CENELEC, NEC500 and 505)
- Exploding risk area Classification (Gas and Dust)
- Risk analysis according to area and equipment
- The different types of protection for electrical ATEX equipment (d, m, ia, ib, etc.)
- The different types of protection for mechanical ATEX equipment (d, c, k, etc.)
- The rules applicable to gas (G) ATEX equipment
- The rules applicable to dust (D) ATEX equipment
- The rules for design, achievement, and maintenance of installations in Explosive Atmospheres
- The marking of the equipment
- Incidences for use and maintenance
- The intervention in ATEX Hazardous Areas
- Worker health and safety protection from explosive atmosphere hazards
- Exercises (calculation of intrinsic loop, appropriateness (suitability) of the equipment, area classification analysis, marking plate of the equipment reading)
- Initial Assessment by questionnaire

Audience
- Person technically responsible for an installation in an explosive area (ATEX)
  - Engineer
  - Project and design manager
  - Supervisor responsible for workers in an explosive area

Learning Path

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<tbody>
<tr>
<td>F004TC</td>
<td>Electrical and mechanical fundamentals</td>
<td>F005TC</td>
</tr>
</tbody>
</table>

Customer Benefits
- Possibility of doing this training course on your own site and at your own convenience
- Exchanges with an experienced instructor
- Theoretical training and exercises with an INERIS* certified instructor
- Exchange of experience and acquiring the right behavior
- Practical test performed in the INERIS laboratories (60 km north of Paris) with several explosion tests in gas, dust, and electrostatic conditions
- Evaluation by questionnaire, and competence certificate issued by INERIS

* INERIS: French National Institute for Industrial and Environmental Risk
Objectives

Know the general characteristics of SF₆ gas.
Control its environmental impact, emissions and the greenhouse effect.
Use the SF₆ gas in total safety.
Carry out the best practices related to the use of SF₆ according to the equipment involved. Understand the functions of equipment used for the recovery, control and measurement of SF₆ gas.

Course topics

- Theoretical part
  - Environment and SF₆ – Regulation EC 842-2006
  - Sulfur hexafluoride
  - Electric components and SF₆
  - Various qualities of SF₆
  - SF₆ design of electrical equipment
  - Storage and transportation of SF₆ – Legal constraints
  - Products of decomposition and neutralization
  - Monitoring of gas
- Practical part
  - Preparation of practical session on SF₆ recovery
  - Practical work on SF₆ recovery and use of suitable PPE in a contaminated environment
- Assessment and certification
  - Theoretical assessment – Individual multiple choice questionnaire
  - Practical work on SF₆ recovery (individual exam)
  - Control and measurement of gas to be recovered
  - Practice of SF₆ recovery using a recovery device
  - Practice of SF₆ recovery and decomposition products

Note: A version of this course applied to the Non-European Regulation CEI/TR 62271-303 is also available. Please refer to course M023TC.

Audience

- Personnel who recover SF₆ gas inside Erection & Commissioning

Customer Benefits

- Exchanges with an experienced instructor
- Each trainee will work on real equipment
- Certification EC 842-2006
- Course limited to 8 trainees for the training to be most effective and to ensure optimum safety on the shopfloor
M021TC
SF6 Gas Recovery Regulation EC 842-2006
(for experienced personnel)

Objectives
Know the general characteristics of SF6 gas.
Control its environmental impact, emissions and the greenhouse effect.
Use SF6 gas in total safety.
Carry out the best practices related to the use of SF6 according to the equipment involved. Understand the functions of equipment used for the recovery, control and measurement of SF6 gas.

Course topics
- Theoretical part
  - Environment and SF6 – Regulation EC 842-2006
  - Sulfur hexafluoride
  - Electric components and SF6
  - Various qualities of SF6
  - SF6 design of electrical equipment
  - Storage and transportation of SF6 – Legal constraints
  - Products of decomposition and neutralization
  - Monitoring of gas and the environment
- Practical part
  - Preparation of practical session on SF6 recovery
  - Practical work on SF6 recovery and use of suitable PPE in a contaminated environment
- Assessment and certification
  - Theoretical assessment – Individual multiple choice questionnaire
  - Practical work on SF6 recovery (individual exam)
  - Control and measurement of gas to be recovered
  - Practice of SF6 recovery using a recovery device
  - Practice of SF6 recovery and decomposition products

Note: A version of this course applied to the Non-European Regulation IEC/TR 62271-303 is also available. Please refer to course M023TC.

Audience
- Personnel who recover SF6 gas

Customer Benefits
- Possibility of doing this training course on your own site and at your own convenience
- Exchanges with an experienced instructor
- Each trainee will work on real equipment
- Certification EC 842-2006
- Course limited to 8 trainees for the training to be most effective and to ensure optimum safety on the shop floor
M023TC
Handling of SF₆ and CF₄ gases according to IEC/TR 62271-303 technical report

Objectives
Understand the general characteristics of SF₆ gases. Master their impact on our environment. Learn how to recover, drain the SF₆ to vacuum, refill a compartment under SF₆ gas. Apply the specific safety rules during the gas recovery operations.

Course topics
- Theoretical part (modules A, B and C)
  - Environment and SF₆ gases
  - Sulfur Hexafluoride SF₆
  - Electrical equipment and fluorinated gases
  - Gas qualities
  - Design of electrical equipment
  - Storage and transport of SF₆ gases – Legal constraints
  - By-products and neutralization
  - Gas monitoring and the environment
- Practical part (modules B and C)
  - Prerequisite: module A
  - Preparation steps before working to recover SF₆ gases
  - Hands-on utilization of the adequate personal protective equipment
  - Recovery of contaminated gases
  - Opening of a breaking chamber (module C)
- Test and certification
  - Theoretical part – Questionnaire
  - Practical part – Individual evaluation on gas-handling according to the level of the IEC/TR 62271-303 (A, B or C) requested

Note: A version of this course applied to the European Regulation EC 842-2006 is also available. Please refer to course M020TC.

Audience
- Trainees with or without experience in gas handling, depending on the desired target level A, B or C

Learning Path

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<tbody>
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<td>People working in the surroundings of, or having to handle SF₆ gases</td>
<td>MO23TC</td>
<td>All Courses related to SF₆ (MV &amp; HV equipment)</td>
</tr>
</tbody>
</table>

Customer Benefits
- Possibility of doing this training course on your own site and at your own convenience
- Exchanges with an experienced instructor
- Related to IEC/TR 62271-303
- Real hands-on work on electrical equipment
- Maximum of 8 participants per session to be most effective and to ensure safety
To optimize your electrical installation you can limit production outages, improve power quality and better manage disturbances that could lead to defaults. In order to achieve this, a good knowledge of electrical network is needed, from electrical basics to design installation, as well as cyber-security and power system protection.
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### Electrical fundamentals

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### Protection & Substation Control

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<tr>
<td>Cyber-security Operation</td>
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</tbody>
</table>
Matching your training needs

To meet your installation needs (new installations, under modifications and/or extensions, etc.), Schneider Electric Technical Institute proposes training courses that cover:

- **Different installation types and architectures**
- **Installations equipped with, or without, Schneider Electric products**
- **Your specific installation.**

Schneider Electric has adopted the blended teaching approach, combining e-Learning programs and face-to-face training. This very effective training method provides the technical expertise to the trainee progressively. **Below is our suggested sequence:**

1. **e-Learning modules:**
   As the first step, in the discovery phase. This training method allows trainees to acquire the fundamentals and useful information at their own pace. Trainees can define their program over a variety of modules that can be followed and completed according to their schedule.

2. **Theoretical courses:**
   To benefit from the experience and knowledge of our instructors in fundamental technical topics. From generic topics as electricity basics to design installation, as well as cyber-security and power system protection. Courses are designed to bring trainees to advanced stage of knowledge that will allow them to go beyond installation and substation expertise and to acquire a global view on network operations.

3. **Operation & Maintenance Courses:**
   To go further by gaining in practice. These practical works are set out in detail in the next chapter.

Whatever course curriculum is chosen, the trainees’ awareness will be raised to normal and fault conditions of network and installation operation. We are convinced that after our course, trainees will be better equipped to analyze situations and determine the appropriate solutions.
**Objectives**
Understand the transmission network growth and operating conditions.
Understand the various technologies related to substation equipment.
Characterize the various structures and master the substation operating conditions.

**Course topics**
- **Topic 1**: Transmission network in Europe
  - Interconnection timeline
  - Organization & network operator
  - Energy exchanges & management
- **Topic 2**: Substation technologies
  - High Voltage substations
  - Power transformers
  - High Voltage circuit-breakers
  - High Voltage disconnectors & surge arresters
  - High Voltage GIS
- **Topic 3**: Architecture of High Voltage substations
  - High Voltage substation structure & diagrams
  - Step-up substations
  - High Voltage interconnect & transformer substations
- **Topic 4**: Substations operating safety & reliability
  - Instrument transformers
  - Protection & control
  - Auxiliary services
- **Topic 5**: High Voltage overhead lines & cables
  - Functions & structure
  - Sizing
  - Construction
  - Available assessments
  - Easy user navigation
  - Various interactive learning activities
  - Online dictionary on transmission and distribution

**Audience**
- All persons wanting to start learning about the principles of the transmission network

**Duration**
17 modules ± 1h
100% Theoretical

**Price**
Contact us

**Dates & Place**
Anytime, anywhere, as long as you have internet access
S003AC

Medium Voltage power distribution (>1kV)
e-Learning training modules

Course topics
- Topic 1: Distribution networks
  - Distribution in the electrical network
  - People involved in deregulation
  - Constitution of the distribution network
- Topic 2: Substation equipment
  - Transformers
  - Medium Voltage switchgear
  - Associated equipment
- Topic 3: Structure & network circuit diagrams
  - Topology
  - Overhead and underground networks
  - Medium Voltage wiring systems
- Topic 4: Protection systems
  - Overcurrents
  - Neutral systems
  - Grounding connection diagrams
- Topic 5: Industrial networks
  - Architecture & voltage levels
  - Power supply sources
  - The railway electrical network
  - Available assessments
  - Easy user navigation
  - Various interactive learning activities
  - Online dictionary on transmission and distribution

Objectives
Understand the evolution in time, the constitution, and the role of distribution networks.
Understand the various technologies associated with the network components.
Characterize the various structures and index the distribution layouts.

Duration
15 modules ± 1h
100% Theoretical

Price
Contact us

Dates & Place
Anytime, anywhere, as long as you have internet access

Audience
- All persons wanting to start learning about the principles of the distribution network

Learning Path

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<tr>
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<td></td>
<td>S003AC</td>
</tr>
<tr>
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</tr>
</tbody>
</table>

Customer Benefits
- Possibility of doing this training course on your own site and at your own convenience
- Exchanges with an experienced instructor
- Assess and train newcomers
- Improve and homogenize team members’ knowledge
- Share technical issues and references within multi-disciplinary or multi-sites teams
- Self-assess knowledge acquisition through quizzes during the learning process
Objectives
Design a Medium Voltage electrical installation.
Estimate the value of short circuit currents.
Select the appropriate switchgear.
Select the appropriate electrical ductwork.

Course topics
- Stages in the design of an installation
  - Installation standards
  - List of equipment used, power balance selection of power supplies:
    - normal, substitute emergency
  - Selection of neutral point connection
- Characteristics of current-using equipment
  - Motors
- Characteristics of various power sources
  - Definitions of the switchgear, symbols
  - Distribution networks, transformers, generator set
- Estimation of short circuit currents
  - Three-phase short-circuit at one point on the network
  - Two-phase short-circuit
- Selection of switchgear
  - Isolator switch, load break switch, contactors fuses, circuit-breakers
- Selection of wiring systems
  - Steady state operating conditions, transient operating conditions
- Industrial networks
  - Connection to the grid, compensation for reactive energy
  - Structures, neutral point connection, earthing faults
  - Protection systems, selectivity: current, time delay and logic relays
- Protection of power transformers
- Case study

Audience
- Engineers and technicians involved in the design, study, modification, maintenance and operation of Medium Voltage industrial installations

Duration
3 or 4 days
60% Theoretical
40% Cases study

Price
Contact us

Dates & Place
Contact us

Customer Benefits
- Possibility of doing this training course on your own site and at your own convenience
- Exchanges with an experienced instructor
- Customize the solutions for troubleshooting (malfunctioning and/or fault mode) and modifications or extensions
**K001AC**

Electricity: Learning the basics

---

**Objectives**

Know how to calculate and measure current, voltage and power, understand basic electrical diagrams and hazards of electrical current.

**Course topics**

Create a simple electrical circuit and learn the principles of electricity, measuring instruments, equipment and switching devices in electrical installations.

- Discover electricity based on simple rules
  - approach to the subject
  - Ohm’s Law
  - power concepts
  - DC and AC current
  - principles of electromagnetism
- Learn how to use simple measuring instruments
  - use of multimeter as voltmeter, ammeter, ohmmeter
- Description of the structure and components of electrical circuits
  - generators
  - loads
  - conductors
  - switching devices (circuit-breakers, fuses, switches, contactors, etc.)
  - symbols used in circuit diagrams
- Know the hazards of electrical current and how to protect against them
  - earth electrode
  - protection circuit
  - study of insulation faults
  - earth leakage protection
- Case study
  - residential electrical installation

**Audience**

- Operators and technicians who start learning electricity basics

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**Learning Path**

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<thead>
<tr>
<th>Prerequisites</th>
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<tr>
<td>You have no knowledge of electricity</td>
<td></td>
<td>K001AC</td>
</tr>
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</table>

**Customer Benefits**

- Exchanges with an experienced instructor
- 40% of training time dedicated to practical work

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**Duration**

4 days

60% Theoretical

40% Practical

**Price**

Contact us

**Dates & Place**

Contact us
K002AC
Electricity: Getting to know MV and LV switchgear

Objectives
Be able to identify and recognize products and their functions in an electrical installation.

Course topics
Identify MV/LV distribution technologies and products. Master electrical installation terminology and situate electrical equipment in distribution architectures.

- Discover the main principles of the production, transmission and distribution of electrical power
- Identify the standards related to electrical equipment and installations
- Learn the role and functions of MV and LV switchgear
- Recognize the conventional architectures used in Medium and Low Voltage equipment
- Study of the electrical characteristics and technology of MV switchgear
  - Breaking technique
  - MV cubicles and switchgear
  - Measurement and protection devices
  - Distribution transformer
- Study of the electrical characteristics and technology of LV switchgear
  - Air circuit-breakers
  - Modular circuit-breakers
  - Switches
  - Contactors
  - Residual current devices
  - Surge arresters
  - Capacitors
- Introduction to the protection of equipment and people
  - Neutral-earth connection or earthing system diagrams
  - Protection equipment: insulation monitor, residual current devices

Audience
- Operators and technicians who start learning LV & MV products and equipment

Customer Benefits
- Practical learning on technical documentation and hands-on learning on equipment in real installation environment
Objectives
Understand the operation and implementation of MV networks.

Course topics
Understand the components included in MV networks.
Discover the different types of architecture.
Learn how to use technical documentation on equipment and do basic calculations for simple installations.

- General
  - standards
  - transmission and distribution networks
  - voltage classification
  - electrical characteristics
- Network architectures
  - network components
  - types of architecture
  - different types of network
- Switchgear functions
  - disconnector
  - switch
  - contactor
  - circuit-breaker
- Different types of sensors
  - current sensors
  - voltage sensors
- Principles of different MV protection functions
  - current-based
  - time-based
  - logical
  - directional
- MV equipment
  - cubicles
  - transformers
  - protection devices
  - fuses
  - study of instruction manuals

Audience
- Operators and technicians who start to operate and implement on MV equipment

Customer Benefits
- Practical learning on technical documentation and hands-on learning on equipment in real installation environment
Objectives
Understand the key principles of protection in High Voltage and EHV transmission networks.

Course topics
- Analysis of Balanced & Unbalanced Faults
- Application of overcurrent & ground fault protection
- Line Distance Protection
- Line Differential Protection
- Auto-Reclosing & Synchro-check automatism
- Current Transformer Requirements for Protection
- System Grounding

Audience
- Maintenance and commissioning engineers, especially those involved with protective relays
- Protection engineers, protection design engineers
- Project managers

Customer Benefits
- Possibility of doing this training course on your own site and at your own convenience
- Exchanges with experienced instructors
- Sustain the success of your business by enhancing employee efficiency and morale
- Reinforce your company’s expert knowledge
- Gain increased understanding of protection principles needed to understand Power system requirements
- Gain the confidence to maintain your system
Objectives
Gain a comprehensive understanding of the principles of selection and application in the most common types of protection found in Transmission and Sub-Transmission power systems.

Course topics
- Transformer Protection
- Bus Protection
- Breaker Fail Logic
- Supervision & Automation facilities in substations
- Generator Protection
- System Stability issues & Wide Area Monitoring
- Impact of Renewable Generations
- Integrated Protection & Control and their advantage
- Substation Automation using IEC 61850 & benefits

Audience
- Maintenance and commissioning engineers, especially those involved with protective relays
- Protection engineers, protection design engineers
- Project managers

Customer Benefits
- Possibility of doing this training course on your own site and at your own convenience
- Exchanges with experienced instructors
- Sustain the success of your business by enhancing employee efficiency and morale
- Reinforce your company’s expert knowledge
- Gain increased understanding of protection principles needed to understand Power system requirements
- Gain the confidence to maintain your system
Objectives
Gain more experience in the theory of protection application for Industrial Medium Voltage network with additional tutorials on fault calculations, relay settings and communication facilities.

Course topics
- Analysis of Balanced & Unbalanced Faults
- System Grounding
- Application of overcurrent & ground fault protection
- Protection coordination rules
- Motor Protection
- Transformer Protection
- Bus Protection
- Feeder Protection
- Generator Protection

Audience
- Protection engineers, Protection design engineers working in Industrial power Network
- Maintenance and commissioning engineers, especially those involved with protective relays
- Project managers

Duration
5 days
100% Theoretical

Price
Contact us

Dates & Place
Contact us

Learning Path

<table>
<thead>
<tr>
<th>Prerequisites</th>
<th>Training</th>
<th>Next Step</th>
</tr>
</thead>
<tbody>
<tr>
<td>APP014 Knowledge and understanding of power networks Electrotechnical and mathematical basics Technician or engineer level</td>
<td></td>
<td>APP016</td>
</tr>
</tbody>
</table>

Customer Benefits
- Possibility of doing this training course on your own site and at your own convenience
- Exchanges with experienced instructors
- Sustain the success of your business by enhancing employee efficiency and morale
- Reinforce your company’s expert knowledge
- Gain increased understanding of protection principles needed to understand Power system requirements
- Gain the confidence to maintain your system
Objective

Based on several case study, this training will give you practical understanding of the theory of protection application for Medium Voltage network in Electro-intensive industry (O&G, Mines & Metals, etc.).

Course topics

- Analysis of Balanced & Unbalanced Faults
- System Grounding
- Fault analysis
- Generator Protection
- Voltage and frequency protection
- Current Transformer Requirements for Protection
- System Stability issues
- Fast load-shedding
- Substation Automation using IEC 61850 & benefits

Audience

- Protection engineers, Protection design engineers working in Industrial power Network
- Maintenance and commissioning engineers, especially those involved with protective relays
- Project managers

Customer Benefits

- Possibility of doing this training course on your own site and at your own convenience
- Exchanges with experienced instructors
- Sustain the success of your business by enhancing employee efficiency and morale
- Reinforce your company’s expert knowledge
- Gain increased understanding of protection principles needed to understand Power system requirements
- Gain the confidence to maintain your system
Objectives

Dedicated to distribution network topology and philosophy, this course will prepare you to face the challenge of smart grids.

Course topics

- Analysis of Balanced & Unbalanced Faults
- System Grounding
- Application of overcurrent & ground fault protection
- Protection coordination rules
- Transformer Protection
- Bus Protection
- Feeder Protection
- Generator Protection
- Distance protection
- Voltage and frequency protection
- Current Transformer Requirements for Protection
- System Stability issues
- Distributed generation
- Demand response
- Substation Automation using IEC 61850 & benefits

Audience

- Protection engineers, Protection design engineers working in Industrial power Network
- Maintenance and commissioning engineers, especially those involved with protective relays
- Project managers

Learning Path

<table>
<thead>
<tr>
<th>Prerequisites</th>
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<tbody>
<tr>
<td>APP016 Knowledge and understanding of power networks</td>
<td>APP018 Electrotechnical and mathematical basics Technician or engineer level</td>
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Customer Benefits

- Possibility of doing this training course on your own site and at your own convenience
- Exchanges with experienced instructors
- Sustain the success of your business by enhancing employee efficiency and morale
- Reinforce your company’s expert knowledge
- Gain increased understanding of protection principles needed to understand Power system requirements
- Gain the confidence to maintain your system
Objectives
Understand the application of the IEC 61850 protocol and acquire a practical knowledge in using this communication protocol.

Course topics
- From the theory to the application:
  - Overview of the protocol and its application for substation Automation
- Main concepts:
  - Services
  - Modelisation
  - System configuration languages
  - Compliances tests
- Applications user cases:
  - Architecture
  - Distributed functions
  - Cohabitation cases (multi-protocol)
  - Systems configuration
  - Interoperability tests
  - Project management

Audience
- Consultants in power systems
- Design Engineers for substation automation
- Project Managers

Learning Path

<table>
<thead>
<tr>
<th>Prerequisites</th>
<th>Training</th>
<th>Next Step</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical substation knowledge</td>
<td></td>
<td>DCS003</td>
</tr>
<tr>
<td>Digital Control system basics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engineers with 2 years' experience</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Customer Benefits
- Possibility of doing this training course on your own site and at your own convenience
- Exchanges with experienced instructors
- Take benefit from IEC 61850 utilization to reduce cost and risks
Objectives
Teach the theory and application of communication within the substation control station, including a comprehensive discussion of the information models, configuration language and services.
Explain the latest developments and the future of IEC 61850.

Course topics
- Bases of the communication technology
  - Authoritative model OSI
  - Protocols in the station automation
  - Communication structures
  - Standards (today and tomorrow)
- Communication networks
  - Construction and structure
  - Facilities
  - Requirements
- Present communication
  - IEC 60870-5-103
  - IEC 60870-5-101
  - IEC 60870-5-104
- IEC 61850
  - Construction of the standard
  - Data model and data services
  - Structures
  - Application

Audience
- Engineers working in the area of substation automation or/and engineers working in the planning of the application

Learning Path

<table>
<thead>
<tr>
<th>Prerequisites</th>
<th>Training</th>
<th>Next Step</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge on substation automation and basic protection</td>
<td></td>
<td>DCS004</td>
</tr>
</tbody>
</table>

Customer Benefits
- Possibility of doing this training course on your own site and at your own convenience
- Exchanges with an experienced instructor
- The trainees will have the necessary knowledge to clearly understand the performances and the limits of the IEC protocols
- The trainees will be able to optimize the data to be exchanged, for example, between substation and SCADA, and to analyze communication protocol
- Application on IEC 61850 Communication Protocol
Objectives
Share a common language and knowledge on Cyber-security. Understand the standards, their philosophy and their implementation in your day-to-day business. Analyze and implement a comprehensive Cyber-security policy. How to react in the face of an issue – initiation to crisis management (technical point of view).

Course topics
- Definition and wording
- NERC-CIP standards
- CIP-001-1a Sabotage Reporting
- CIP-002-3 Critical Cyber Assets
- CIP-003-3 Security Management Controls
- CIP-004-3 Personnel and Training
- CIP-005-3 Electronic Security
- CIP-006-3 Physical Security
- CIP-007-3 Systems Security Management
- CIP-008-3 Incident Reporting and Response Planning
- CIP-009-3 Recovery Plans
- Cases Study (6 different practical cases)

Audience
- Cyber-security managers/officers who need to define and implement Cyber-security policy within their company

Duration
2 days
75% Theoretical
25% Cases study

Price
Contact us

Dates & Place
Contact us

Customer Benefits
- Possibility of doing this training course on your own site and at your own convenience
- Exchanges with an experienced instructor
- Understand the concept of Cyber-security
- Have a pragmatic approach of CS
- Avoid basic mistakes when defining CS policy
GEE011
Cyber-security Operation

Objectives
Share a common language and knowledge on Cyber-security. Implement the Cyber-security in your operation and maintenance tasks.

Course topics
- Definition and wording
- NERC-CIP standards,
- CIP-001-1a Sabotage Reporting
- CIP-002-3 Critical Cyber Assets
- CIP-003-3 Security Management Controls
- CIP-004-3 Personnel and Training
- CIP-005-3 Electronic Security
- CIP-006-3 Physical Security
- CIP-007-3 Systems Security Management
- CIP-008-3 Incident Reporting and Response Planning
- CIP-009-3 Recovery Plans
- Cases Study focusing on operation, maintenance
- Best practices

Audience
- Operation and maintenance staff dealing with Digital protection and Control system in electrical substation

Duration
2 days
75% Theoretical
25% Cases study

Price
Contact us

Dates & Place
Contact us

Learning Path

<table>
<thead>
<tr>
<th>Prerequisites</th>
<th>Training</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experience in maintenance, operation and commissioning of digital protection and control systems</td>
<td>GEE011</td>
</tr>
</tbody>
</table>

Customer Benefits
- Possibility of doing this training course on your own site and at your own convenience
- Exchanges with an experienced instructor
- Understand the concept of Cyber-security
- Have a pragmatic approach of CS
- Avoid basic mistakes when defining CS policy
Operation and maintenance

When it comes to equipment operation and maintenance, theoretical study is necessary but not sufficient to optimize personnel responsiveness. In-depth product knowledge is vital to ensure the Power service continuity. What makes a real difference is the experience site personnel can gain through practice, over the years, and through training.
## Electrical Distribution equipment

<table>
<thead>
<tr>
<th>Description</th>
<th>Code</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>e-Learning fundamentals for Medium Voltage equipment up to 50 kV</td>
<td>S004AC</td>
<td>59</td>
</tr>
<tr>
<td>e-Learning fundamentals for transformer technology, features and applications</td>
<td>S007AC</td>
<td>60</td>
</tr>
<tr>
<td>LV equipment: operate and maintain equipment solutions</td>
<td>L001AC</td>
<td>61</td>
</tr>
<tr>
<td>Electricity: operate and maintain your MV/LV transformer stations</td>
<td>K003AC</td>
<td>62</td>
</tr>
<tr>
<td>MV switchgear: operating and maintaining equipment solutions</td>
<td>M031AC</td>
<td>63</td>
</tr>
<tr>
<td>WI Gas Insulated switchgear up to 52 kV – Operation &amp; maintenance</td>
<td>M002TC</td>
<td>64</td>
</tr>
<tr>
<td>GMA Gas Insulated switchgear up to 24 kV – Operation &amp; maintenance</td>
<td>M003TC</td>
<td>65</td>
</tr>
<tr>
<td>FBX Gas Insulated RMU up to 24 kV – Operation &amp; maintenance</td>
<td>M005TC</td>
<td>66</td>
</tr>
<tr>
<td>HVX Vacuum circuit-breaker up to 36 kV – Operation &amp; maintenance</td>
<td>M006TC</td>
<td>67</td>
</tr>
<tr>
<td>Getting to grips with a Medium Voltage installation</td>
<td>M010TC</td>
<td>68</td>
</tr>
<tr>
<td>Fixed and Compact sized SF6 Gas switchboards – Operation &amp; maintenance</td>
<td>M012TC</td>
<td>69</td>
</tr>
<tr>
<td>PIX &amp; Px Withdrawable SF6 Gas switchboards – Operation &amp; maintenance</td>
<td>M014TC</td>
<td>70</td>
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<tr>
<td>VISEX Maintenance and fault clearing</td>
<td>M015TC</td>
<td>71</td>
</tr>
<tr>
<td>PIX Withdrawable Switchboards (fitted with Vacuum circuit-breaker) – Operation &amp; maintenance</td>
<td>M016TC</td>
<td>72</td>
</tr>
<tr>
<td>RM6 MV Gas-isolated switchgear RM6 &lt; 24 kV</td>
<td>M017TC</td>
<td>73</td>
</tr>
<tr>
<td>SM6 MV Air-isolated switchgear SM6 &lt; 36 kV</td>
<td>M018TC</td>
<td>74</td>
</tr>
<tr>
<td>LF MV switchgear – Use, installation and maintenance</td>
<td>M019TC</td>
<td>75</td>
</tr>
<tr>
<td>SF MV switchgear – Use, installation and maintenance</td>
<td>M024TC</td>
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<tr>
<td>Ringmaster RN2C – Operation and maintenance</td>
<td>M025TC</td>
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<tr>
<td>GenieEvo switchgear – Operation and maintenance</td>
<td>M026TC</td>
<td>78</td>
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<tr>
<td>Evolis MV switchgear – Use, installation and maintenance</td>
<td>M027TC</td>
<td>79</td>
</tr>
<tr>
<td>Motorpact MV motor control center – Use, installation and maintenance</td>
<td>M028TC</td>
<td>80</td>
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<tr>
<td>MCset 1 2 3 switchgear – Use, installation and maintenance</td>
<td>M029TC</td>
<td>81</td>
</tr>
<tr>
<td>Distribution transformers – Principles, installation, use and maintenance</td>
<td>T001TC</td>
<td>82</td>
</tr>
</tbody>
</table>

## Protections

<table>
<thead>
<tr>
<th>Description</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Micom Px20 et Px40 Master Class</td>
<td>MICOM002</td>
</tr>
<tr>
<td>Micom Px30 Master Class</td>
<td>MICOM004</td>
</tr>
<tr>
<td>Railway protection</td>
<td>MICOM006</td>
</tr>
<tr>
<td>Overcurrent and Feeder Protection – Micom P12x and P14x</td>
<td>MICOM120</td>
</tr>
<tr>
<td>Motor Protection – Micom P22x and P24x</td>
<td>MICOM121</td>
</tr>
<tr>
<td>Generator Protection – Micom P34x</td>
<td>MICOM122</td>
</tr>
<tr>
<td>Distance Protection – Micom P44x</td>
<td>MICOM123</td>
</tr>
<tr>
<td>Line Differential Protection – Micom P52x and P54x</td>
<td>MICOM124</td>
</tr>
<tr>
<td>Voltage and Frequency Protection – Micom P92x and P94x</td>
<td>MICOM125</td>
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<tr>
<td>Differential Transformer Protection – Micom P63x</td>
<td>MICOM127</td>
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<tr>
<td>Distance Protection Device – Micom P437</td>
<td>MICOM128</td>
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<tr>
<td>Feeder Protection Device – Micom P139</td>
<td>MICOM129</td>
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<tr>
<td>Digital Differential Busbar Protection – Micom P74x</td>
<td>MICOM130</td>
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<tr>
<td>Distance Protection Device for Railway Application – Micom P438</td>
<td>MICOM132</td>
</tr>
<tr>
<td>Sepam Master Class</td>
<td>SEP01</td>
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<tr>
<td>Sepam 80 Expert</td>
<td>SEP02</td>
</tr>
<tr>
<td>Sepam Communication with IEC 61850</td>
<td>SEP04</td>
</tr>
<tr>
<td>Sepam 60 Expert</td>
<td>SEP05</td>
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</tbody>
</table>

## Substations Control

<table>
<thead>
<tr>
<th>Description</th>
<th>Code</th>
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</thead>
<tbody>
<tr>
<td>Micom C264: Compact RTU (Remote Terminal Unit)</td>
<td>DCS006</td>
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<tr>
<td>Fundamentals of Digital Control System and PACiS Operation &amp; Maintenance Principles</td>
<td>DCS007</td>
</tr>
<tr>
<td>PACiS Protection Automation &amp; Control – Architecture &amp; Operation</td>
<td>DCS008</td>
</tr>
<tr>
<td>PACiS Protection Automation &amp; Control – Architecture, Operation &amp; Maintenance</td>
<td>DCS009</td>
</tr>
<tr>
<td>Configuration of IEC 61850 communication on Micom Px30 and Px40 series</td>
<td>DCS020</td>
</tr>
<tr>
<td>Configuration of the Easergy range</td>
<td>EASER02</td>
</tr>
<tr>
<td>IRio / Kerwin basics</td>
<td>IRIO01</td>
</tr>
</tbody>
</table>

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Matching your training needs

In operation and maintenance, theory is needed, practice is essential!

It is clear that no operation or maintenance can be achieved without a minimum of electricity product study. A theoretical approach will allow your teams to acquire the right competencies quicker. Practical training will provide in weeks what field experience can bring you in years.

The world’s highest performing networks, substations or products rely on the highest performing people. The more efficiently they manage and understand data, the quicker the fault consequences are minimized.

Schneider Electric Technical Institute offers training courses with the right blend of theory and practice:

- Participants must first follow an e-Learning program to understand the fundamentals of the electrical energy distribution and to free up time to complete as much practical cases as possible during classroom sessions.
- During the theoretical part of each courses, participants make an in-depth study of products and/or solutions. This step is crucial to understand the electrical and the mechanical constraints encountered in the equipment’s lifespan.
- During the practical part, participants can put into practice their knowledge on real-size equipment through hands-on work exercises. This ensures that trainees carry out the exact and correct operation. It is the best way to enhance the practical memory of employees.

Our training courses cover a large range of equipment:

- **Electrical Distribution equipment:**
  - Operational issues such as safe operating conditions, correct interlocking, equipment monitoring, fault simulations, fault diagnosis and troubleshooting.
  - Maintenance issues such as maintenance plan (e.g., scheduled/condition maintenance), maintenance procedures (e.g., regular/repair operations) and testing procedures before return to normal operation.

- **Protection and Substations controls:**
  A comprehensive understanding of protection principles when setting parameters, analyzing disturbance data and managing failures.
  The courses allow participants to reinforce the protection schemes and the digital control system for substations. These will definitely help your staff improve their responsiveness when faced with unexpected incidents.

Your equipment at the heart of our training offering

Thanks to the modular design of our training courses, each course can be fully adapted to your own specific electrical equipment (product specification, maintenance procedures, etc.) to create and deliver customized teaching material that will optimize the competence of your personnel.

These courses have a limited number of attendees to ensure that they get the most out of the hands-on training and practice. Workshops are conducted on full-size equipment delivered by our technical expert instructors. This enables them to learn in their daily activity environment, and enables them to easily apply what they’ve learned when they get back to work.
**Objectives**

Prepare to the classroom session.
Discover the distribution networks’ part in the electrical network.
Understand the transformer’s part in the distribution network.
Understand the characteristics of the public distribution networks’ switchgear.
Know the industrial networks’ architecture specifications.

**Course topics**

- Module 1: Distribution in the electrical network
- Module 2: Transformer
- Module 3: Medium Voltage switchgear
- Module 4: Equipment associated with the switchgear
- Module 5: Industrial networks’ architecture and voltage levels

- Available assessments
- Easy user navigation
- Various interactive learning activities
- Online dictionary on Distribution

**Audience**

- People wishing to enhance their distribution network working knowledge and to improve their technical understanding of distribution products and solution

**Learning Path**

<table>
<thead>
<tr>
<th>Prerequisites</th>
<th>Training</th>
<th>Next Step</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic knowledge in electricity</td>
<td></td>
<td>S004AC</td>
</tr>
<tr>
<td></td>
<td></td>
<td>All Medium Voltage Courses</td>
</tr>
</tbody>
</table>

**Customer Benefits**

- Possibility of doing this training course on your own site and at your own convenience
- Exchanges with an experienced instructor
- Accessible training 24/7
- Time saving, courses done at the trainee’s own pace
- Technical guarantee of contents designed by experts
- To be used before and after classroom session
Objectives
Understand the various transformer technologies related to substations. Know how transformers step-up or step-down voltages, adjust network voltages. Know the differences between transformer types.

Course topics
- Module 1: High Voltage Substations
  - Arrangement with transformers
- Module 2: Power transformers
  - Principles
  - Technologies
  - Tap-changers
- Module 3: Role of Transformers within a power plant
  - Main transformers
  - Auxiliary transformers
- Module 4: Instrument transformers
  - Current transformers
  - Voltage transformers
- Module 5: Distribution transformers
  - Oil-immersed type
  - Dry types
  - Cooling systems

- Available assessments
- Easy user navigation
- Various interactive learning activities
- Online dictionary on Transmission

Audience
- People wishing to enhance their Transmission & Distribution working knowledge and especially to improve their technical understanding of transformers

Learning Path

<table>
<thead>
<tr>
<th>Prerequisites</th>
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<tbody>
<tr>
<td>Basic knowledge in electricity</td>
<td>S007AC</td>
<td>S002AC, S003AC, T001TC</td>
</tr>
</tbody>
</table>

Customer Benefits
- Possibility of doing this training course on your own site and at your own convenience
- Exchanges with an experienced instructor
- Accessible training 24/7
- Time saving, courses done at the trainee’s own pace
- Technical guarantee of contents designed by experts
- To be used before and after classroom session
Objectives
To operate and maintain LV circuit-breakers more efficiently.

Course topics
Operate LV circuit-breakers.
Carry out level II maintenance operations, AFNOR standard.
Set and configure the various types of trip units.
  ● Reminder of the characteristics and functions of LV circuit-breakers:
    ○ understand all the data written on a circuit-breaker (rating plates, trip unit and machine)
    ○ consequences of harmonics on the installation
  ● Understand the principles of circuit-breaker cut-off:
    ○ the various technologies
  ● Know the ranges of LV circuit-breakers, their characteristics and performance:
    ○ Multi 9/Acti 9 range
    ○ Compact NS/NSX/C/CM
    ○ Masterpact M/NT/NW
  ● Know how to set and configure trip units:
    ○ read and analyze tripping curves
    ○ setting of TM thermal-magnetic trip units
    ○ setting and configuring of ST and STR control units
    ○ setting and configuring of Micrologic control units
  ● Practical exercises
    ● Carry out the main replacement and adaptation operations – Level II AFNOR:
      ○ operations, maintenance, replacement and adaptation on the circuit-breakers of the various ranges
      ○ plugging/unplugging operations
      ○ adaptation of electrical auxiliary units: MN, MX, XF, electric control, auxiliary contacts, etc.

Audience
● People who work with the operation and maintenance of an LV electrical installation

Customer Benefits
● Trainees will gain physical understanding of equipment in an actual installation environment
Objectives
Be able to perform operating and level I maintenance operations in all safety.

Course topics
Know how to identify the various components of an LV/MV consumer substation (with or without LV/MV metering), transformer or splitting substation. Know the principles of installing, operating and maintaining MV/LV transformer stations (MV cubicles, MV/LV transformers, LV switchboards, etc.)
- Know the architecture of the substation depending on standards:
  - areas of application (public/private limit, metering, etc.)
  - applicable regulations
  - types of distribution (antenna, loop, double shunt)
- Identify the components of the MV switchboard:
  - types and characteristics of MV cubicles, isolating switch, switch, circuit-breaker, etc.)
  - operation and maintenance
- Operate and maintain MV/LV transformers:
  - types (ERT, sec) and characteristics (voltage, coupling)
  - protections (DGPT2)
  - preventive maintenance operation.
- Identify the components of the LV switchboard:
  - power equipment (switch, circuit-breaker)
  - reminders on earthing diagrams
  - switchboard maintenance operation
- Substation accessories:
  - auxiliary voltage
  - operating and extinction equipment
  - signaling
- Practical work on our installations:
  - reminder of the concept of qualification/competence and example of lock-out procedure
  - reading, interpretation and interlocking operation
  - replacing a HV fuse
  - changing a voltage switch on a transformer
  - cubicle maneuver
  - lock-out sequences

Audience
- Electricians in charge of operation and Level I maintenance of the equipment of MV/LV electrical installations.

Learning Path

<table>
<thead>
<tr>
<th>Prerequisites</th>
<th>Training</th>
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<tbody>
<tr>
<td>K002AC or M030AC</td>
<td>K003AC</td>
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<tr>
<td>Basic knowledge in</td>
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<tr>
<td>the field of electric maintenance</td>
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</tbody>
</table>

Customer Benefits
- Training courses with hands-on practice MV installations equipped with modular or compact cubicles and oil bath transformers
Objectives
Be able to optimally operate and maintain MV distribution equipment.

Course topics
Safely handle the equipment in your MV substations (consumer substation, secondary transmission substation, ring substation).
Apply maintenance rules to the MV equipment in your substations in order to keep them operative.

- Identify different MV electrical distribution architectures
- Understand the electrical safety aspects required for the operation of MV equipment:
  - review of safety rules
  - lock-out
- Make the connection between breaking techniques and reduced maintenance
- Study the electrical characteristics, handling and maintenance of the different ranges of MV equipment:
  - presentation and characteristics of equipment
  - description of cubicle components
  - main functions performed
  - operations
  - adding auxiliaries
  - maintenance and replacement operations (AFNOR level II)
- Hands-on exercises
  - Identification of MV equipment handling, switching, maintenance and replacement components and operations

Audience
- Maintenance operators, technicians and engineers

Learning Path

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>K002AC - M030AC</td>
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<td>M031AC</td>
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</tbody>
</table>

You have basic knowledge in the area of electrical maintenance or have taken course K002AC or M030AC

Customer Benefits
- Hands-on learning of equipment by trainees in a real installation environment
Objectives
Understand the function of the WI circuit-breaker and the mechanism.
Operate switchgear.
Apply maintenance procedures.
Apply safety rules.

Course topics
- Theoretical part
  - General development of Medium Voltage switchgears
  - Principal rated values
  - Design concept
  - Operation panel
  - Drive and interlock unit
  - Interrogation interlock
  - Gas compartments
  - Encapsulation of all live parts
  - Bus bar system
  - Vacuum circuit-breaker
  - Arc quenching in vacuum
  - Contact material
  - Three-position disconnector
  - Voltage and current transformer
  - Dimension and weights
  - Voltage and gas indication devices
  - Sulfur hexafluoride SF₆
- Practical part
  - Principle arrangement and function of VCB driving mechanism in switchgear type WI
  - Mechanism ON / Mechanism OFF
  - Charging, coupling and switching shaft
  - Principle arrangement of Vacuum Interrupter
  - Maintenance according operating instructions

Audience
- Technicians involved in the operation and maintenance of Medium Voltage substations installations

Learning Path

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<tbody>
<tr>
<td>S004AC Basic knowledge in</td>
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<td>M002TC</td>
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<tr>
<td>electricity and mechanics</td>
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</table>

Customer Benefits
- Possibility of doing this training course on your own site and at your own convenience
- Exchanges with an experienced instructor
- Real hands-on work on electrical equipment
- Practice in operating of the switchgear type WI
- Immediate practice of the theoretical knowledge acquired
- Repair of minor failures
Objectives
Understand the function of the GMA circuit-breaker and the mechanism.
Operate switchgear.
Apply maintenance procedures.
Apply safety rules.

Course topics
- Theoretical part
  - General development of Medium Voltage switchgears
  - Principal rated values
  - Design concept
  - Operation panel
  - Drive and interlock unit
  - Interrogation interlock
  - Gas compartments
  - Encapsulation of all live parts
  - Bus bar system
  - Vacuum circuit-breaker
  - Arc quenching in vacuum
  - Contact material
  - Voltage and current transformer
  - Dimension and weights
  - Voltage and gas indication devices
  - Sulfur hexafluoride SF₆
- Practical part
  - Principle arrangement and function of VCB driving mechanism in switchgear type GMA
  - Mechanism ON / Mechanism OFF
  - Principle arrangement of Vacuum Interrupter
  - Maintenance according operating instructions

Audience
- Technicians involved in the operation and maintenance of Medium Voltage substations installations

Learning Path

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</table>

Basic knowledge in electricity and mechanics

Customer Benefits
- Possibility of doing this training course on your own site and at your own convenience
- Exchanges with an experienced instructor
- Real hands-on work on electrical equipment
- Practice in operating of the switchgear type GMA
- Immediate practice of the theoretical knowledge acquired
- Repair of minor failures
Objectives
Understand the function of the FBX and the mechanism.
Operate RMU.
Apply safety rules.

Course topics
- Theoretical part
  - General development of Medium Voltage switchgears
  - Principal rated values
  - Design concept
  - Operation panel
  - Interrogation interlock
  - Gas compartments
  - Encapsulation of all live parts
  - Bus bar system
  - Switch disconnector
  - Vacuum circuit-breaker (M030AC)
  - Arc quenching in vacuum
  - Contact material
  - Fuse (T1) / Protection Relays (M030AC)
  - Voltage and current transformer
  - Dimension and weights
  - Gas indication devices
  - Sulfur hexafluoride SF₆
- Practical part
  - Principle arrangement and function of driving mechanism in RMU type FBX
  - Mechanism SF
  - Mechanism SFU
  - Principle arrangement of Vacuum Interrupter
  - Trouble-shooting

Audience
- Technicians involved in the operation and maintenance of Medium Voltage substations installations

Customer Benefits
- Possibility of doing this training course on your own site and at your own convenience
- Exchanges with an experienced instructor
- Real hands-on work on electrical equipment
- Practice in operating of the switchgear type FBX
- Immediate practice of the theoretical knowledge acquired
- Repair of minor failures
Objectives
Understand the function of the HVX circuit-breaker and the mechanism.
Operate circuit-breaker.
Apply maintenance procedures.
Apply safety rules.

Course topics
- Theoretical part
  - General development of Medium Voltage switching devices
  - Principal rated values
  - Design concept
  - Operation
  - Drive and interlock unit
  - Vacuum bottles
  - Arc quenching in vacuum
  - Contact material
  - Dimension and weights
- Practical part
  - Principle arrangement and function of VCB driving mechanism
  - Mechanism ON / Mechanism OFF
  - Charging mechanism
  - Principle arrangement of Vacuum Interrupter
  - Maintenance according operating instructions

Audience
- Technicians involved in the operation and maintenance of Medium Voltage switching devices

Learning Path
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<tr>
<td>S004AC Basic knowledge in electricity and mechanics</td>
<td>M006TC</td>
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</tbody>
</table>

Customer Benefits
- Possibility of doing this training course on your own site and at your own convenience
- Exchanges with an experienced instructor
- Real hands-on work on electrical equipment
- Practice in operating of the Vacuum Circuit-Breaker type HVX
- Immediate practice of the theoretical knowledge acquired
- Repair of minor failures
M010TC
Getting to grips with a Medium Voltage installation

Objectives
Identify the electrical components in a transformer substation or supply substation.
Understand the function of each mechanism.
Understand the technology of the equipment.
Perform standard operations.

Course topics
- Reminder of electrical safety standards
- Knowledge of the switchgear
  - Functions
  - Characteristics
  - Standards
  - Technology
- Distribution methods
  - Single feeder, double feeder
  - Automatic transfer
  - Ring main
  - Normal-emergency
  - Coupling
- Interlocks
  - Function interlocks and padlocking
  - Operation interlocks
- Standard operations on the various bays
- Preventive maintenance

Audience
- Technicians in charge of Medium Voltage substation equipment operation and maintenance

Learning Path
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<tr>
<td>and electrical safety</td>
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</tbody>
</table>

Dates & Place
Contact us

Customer Benefits
- Possibility of doing this training course on your own site and at your own convenience
- Exchanges with an experienced instructor
- Real hands-on work on electrical equipment
- Master and optimize the use of your equipment
- Optimize the qualification and the responsiveness of your staff
- Limit production stoppages
- Acquire the "know how" and correct conduct

Duration
3 days
60% Theoretical
40% Practical

Price
Contact us

Prerequisites Training Next Step
Objectives
Understand the function of each mechanism.
Operate switchgear.
Apply operation and motorization procedures.

Course topics
- Transient phenomena occurring and opening or closing switchgear
- Electrical arc
  - Development and extinction
- SF₆ gas
  - Chemical composition, physical properties, electrical properties
  - By-products of decomposition
  - Video presentation
- Different types of bay
  - Function: incoming, outgoing
  - Use diagrams, mechanical and key locking
  - Operation, safety of operation
  - Check before commissioning
- Motorization
  - Mechanism dismantling
  - Adaptation parts
  - Assembly of new mechanisms
  - Motorization
  - Tests
- Fuse
  - Function
  - Replacement
- Practical work on bays

Audience
- Technicians involved in the operation and maintenance of installations handling voltages between 1 kV and 50 kV

Duration
- 3 days
- 30% Theoretical
- 70% Practical

Price
Contact us

Dates & Place
Contact us

Customer Benefits
- Possibility of doing this training course on your own site and at your own convenience
- Exchanges with an experienced instructor
- Real hands-on work on electrical equipment
- Master and optimize the use of your equipment
- Optimize the qualification and the responsiveness of your staff
- Limit production stoppages
- Acquire the "know how" and correct conduct
Objectives
Understand the function of each mechanism.
Operate switchgear.
Apply maintenance procedures.

Course topics
- **PIX cell**
  - Description, operation, installation, connecting to the busbar
  - Tightening torques
  - Installation of the moving parts (FPX circuit-breaker)
  - Tests
- **SF₆ gas**
  - Chemical composition, physical properties, electrical properties
  - By-products of decomposition
  - Breaking of the arc in SF₆ gas
- **FPX circuit-breaker**
  - Interruption chamber
  - Procedures for adjusting pressure on receipt of the circuit-breaker
  - Verifications
  - Switching operations, maintenance
- **BRH control mechanism**
  - Description, operation
  - O-C-O sequence: tensioning, closing, tripping
  - Switching operations
  - Maintenance: 3-year or 6-year service interval, verification, lubrication, replacement of auxiliaries, adjustments, tests
- **Low Voltage module**
  - Function, commissioning, operation
- **Practical work on cells, circuit-breakers and associated control mechanisms**

Audience
- Technicians involved in the operation and maintenance of installations handling voltages between 1 kV and 50 kV

Learning Path
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<tbody>
<tr>
<td>S004AC</td>
<td>[M014TC]</td>
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</tbody>
</table>

Basic knowledge in electricity and mechanics

Customer Benefits
- Possibility of doing this training course on your own site and at your own convenience
- Exchanges with an experienced instructor
- Real hands-on work on electrical equipment
- Master and optimize the use of your equipment
- Optimize the qualification and the responsiveness of your staff
- Limit production stoppages
- Acquire the "know how" and correct conduct
M015TC
VISAX Maintenance and fault clearing

Objectives
Understand the function of each mechanism.
Operate switchgear.
Apply maintenance and fault clearing procedures.

Course topics
- Medium Voltage cubicles VISAX type
  - Technical characteristics
  - Standards and circuit-breakers manufacture range
  - BLV Vacuum circuit-breaker
  - Different compartments
  - Arrangements
- Installation and commissioning
  - Transport and handling
  - Installation and connections
  - Circuit-breaker handling
  - Commissioning tests
- Operation and maintenance
  - Operating instructions

Audience
- Technicians involved in the operation and maintenance of installations handling voltages between 1 kV and 50 kV

Duration
3 days
100% Theoretical (incl. demonstration)

Price
Contact us

Dates & Place
Contact us

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<td>Basic knowledge in electricity and mechanics</td>
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</tbody>
</table>

Customer Benefits
- Possibility of doing this training course on your own site and at your own convenience
- Exchanges with an experienced instructor
- Real hands-on work on electrical equipment
### Objectives
Understand the function of each mechanism.  
Operate switchgear.  
Apply maintenance procedures.

### Course topics
- **PIX cell**
  - Description, operation, installation, connecting to the busbar  
  - Tightening torques  
  - Installation of the moving parts (FPX circuit-breaker)  
  - Tests  
- **Vacuum breaking**
  - Breaking principle  
- **Vacuum circuit-breaker**
  - Interruption chamber  
  - Verifications  
  - Switching operations, maintenance  
- **Different control mechanism**
  - Description, operation  
  - O-C-O sequence: tensioning, closing, tripping  
  - Switching operations  
  - Maintenance: 3-year or 6-year service interval, verification, lubrication, replacement of auxiliaries, adjustments, tests  
- **Low Voltage module**
  - Function, commissioning, operation  
- **Practical work on bays, circuit-breakers and associated control mechanisms**

### Audience
- Technicians involved in the operation and maintenance of installations handling voltages between 1 kV and 50 kV

### Learning Path
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</table>

### Customer Benefits
- Possibility of doing this training course on your own site and at your own convenience  
- Exchanges with an experienced instructor  
- Real hands-on work on electrical equipment  
- Master and optimize the use of your equipment  
- Optimize the qualification and the responsiveness of your staff  
- Limit production stoppages  
- Acquire the “know how” and correct conduct
Objectives

Operation, Design and Function, Inspection and Repair of minor failures. Participants will acquire knowledge of the application, operation and function of the gas-isolated switchgears RM6. Practical activities for operation, maintenance and troubleshooting are taught under expert guidance and performed independently. The characteristics and environmentally handling of SF₆ Gas are shown.

Course topics

- Design and function of gas-isolated switchgears and components
- Design features of the switchgear, gas-filled compartments and bushings
- Design and function of the drive mechanism
- Construction of the High Voltage terminal
- Information and exercises for installation, operation, testing and troubleshooting Environmentally handling with SF₆-Gas; physically and chemical characteristics
- Maintenance
- Safety instructions and procedures
- Overview of the necessary tests and analysis of test and measurement results

Audience

- Operation engineers, Maintenance engineers

Learning Path

<table>
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<tr>
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<tbody>
<tr>
<td>K002AC</td>
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<td>M017TC</td>
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</tbody>
</table>

Getting to know MV and LV switchgear

Customer Benefits

- Exchanges with an experienced instructor
- Real hands-on work on electrical equipment
- Practice in operating of the switchgear
- Immediate practice of the theoretical knowledge acquired
- Repair of minor failures
Objectives
Operation, Design and Function, Inspection and Repair of minor failures. Participants will get knowledge of the application, operation and function of the air-isolated switchgears SM6. Practical activities for operation, maintenance and troubleshooting are taught under expert guidance and performed independently.

Course topics
- Design and function of air-isolated switchgears and components
- Design features of the switchgear, compartments and bushings, transformer and cable connectors
- Design and function of the circuit-breaker and principle of current interruption
- Design and function of the drive and locking concept Information and exercises for operation, testing and troubleshooting
- Maintenance
- Safety instructions and procedures
- Testing and analysis of test and measurement results

Audience
- Operation engineers, Maintenance engineers

Customer Benefits
- Exchanges with an experienced instructor
- Real hands-on work on electrical equipment
- Practice in operating of the switchgear
- Immediate practice of the theoretical knowledge acquired
- Repair of minor failures
Objectives
To conduct preventive and corrective maintenance on MV switchgear LF.

Course topics
- Basic and essential knowledge
  - MV approach
  - Secondary distribution
  - Ranges presentations
  - New standard
  - Catalogue LF 2008
  - Instruction for use
  - Including application on demo units

Audience
- Operation engineers, Maintenance engineers

Customer Benefits
- Possibility of doing this training course on your own site and at your own convenience
- Exchanges with an experienced instructor
- Real hands-on work on electrical equipment
- Practice in operating of the switchgear
- Immediate practice of the theoretical knowledge acquired
- Repair of minor failures
M024TC
SF MV switchgear – Use, installation and maintenance

Objectives
Perform preventive and corrective maintenance on MV switchgear SF.

Course topics
- Basic and essential knowledge
  - MV approach
  - Secondary distribution
  - Range presentation
  - New standard
  - Catalogue SF 2010
- Detailed technical points
  - Instruction for use

Audience
- Operation engineers, maintenance engineers

Learning Path
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>K002AC Getting to know MV and LV switchgear</td>
<td>M024TC</td>
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</tbody>
</table>

Customer Benefits
- Possibility of doing this training course on your own site and at your own convenience
- Exchanges with an experienced instructor
- Real hands-on work on electrical equipment
- Practice in operating of the switchgear
- Immediate practice of the theoretical knowledge acquired
- Repair of minor failures
M025TC
Ringmaster RN2C – Operation and maintenance

Objectives
To conduct preventive and corrective maintenance installation on outdoor switchgear Ringmaster.

Course topics
- Introduction
- Define the main variants and ratings
- Architecture and main components
- Interruption system
- Gas pressure indication
- Endurance characteristics
- Overview of protection system
- Mechanism operation
- Cable testing facility
- Circuit-breaker reset
- Protection reset
- Visual checks

Audience
- Operation engineers, Maintenance engineers

Customer Benefits
- Possibility of doing this training course on your own site and at your own convenience
- Exchanges with an experienced instructor
- Real hands-on work on electrical equipment
- Practice in operating of the switchgear
- Immediate practice of the theoretical knowledge acquired
- Repair of minor failures
Objectives
Perform preventive and corrective maintenance installation on GenieEvo switchgear.

Course topics
- Introduction
- Define the main variants and ratings
- Architecture and main components
- Evolis vacuum circuit-breaker
- Controlled air disconnector
- Voltage transformer
- Endurance characteristics
- Oscillator and circuit-breaker mechanism operation
- Cable testing facility
- Voltage transformer compartment
- Protection reset
- Visual checks

Audience
- Operation engineers, Maintenance engineers

Customer Benefits
- Possibility of doing this training course on your own site and at your own convenience
- Exchanges with an experienced instructor
- Real hands-on work on electrical equipment
- Practice in operating of the switchgear
- Immediate practice of the theoretical knowledge acquired
- Repair of minor failures
M027TC

Evolis MV switchgear – Use, installation and maintenance

Objectives
Perform preventive and corrective maintenance installation on MV Switchboards Evolis.

Course topics
- Basic and essential knowledge
  - MV approach
  - Secondary distribution
  - Range presentation
  - New standard
  - Catalogue Evolis 17.5 kV
  - User manual 2003
  - Including application on demo units

Audience
- Operation engineers, Maintenance engineers

Duration
0.5 day
50% Theoretical
50% Practical

Price
Contact us

Dates & Place
Contact us

Learning Path

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<td>K002AC</td>
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<td>M027TC</td>
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</table>

Getting to know MV and LV switchgear

Customer Benefits
- Possibility of doing this training course on your own site and at your own convenience
- Exchanges with an experienced instructor
- Real hands-on work on electrical equipment
- Practice in operating of the switchgear
- Immediate practice of the theoretical knowledge acquired
- Repair of minor failures
Objectives
Perform preventive and corrective maintenance installation on MV motor control center Motorpact.

Course topics
- Basic and essential knowledge
  - MV approach
  - Range presentation
  - IEC standard
  - Commercial catalogue
- Detailed technical points
  - Technical leaflets
  - Including application on demo units

Audience
- Operation engineers, Maintenance engineers

Learning Path
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Getting to know MV and LV switchgear

Customer Benefits
- Possibility of doing this training course on your own site and at your own convenience
- Exchanges with an experienced instructor
- Real hands-on work on electrical equipment
- Practice in operating of the switchgear
- Immediate practice of the theoretical knowledge acquired
- Repair of minor failures
Objectives

Perform preventive and corrective maintenance installation on switchgear MCset 1 2 3.

Course topics

- Basic and essential knowledge
  - MV approach
  - Range presentation
  - Standard
  - Commercial catalogue
- Detailed technical points
  - Technical leaflets
  - Special technical points
  - Videos
  - Including application on demo units

Audience

- Operation engineers, Maintenance engineers

Customer Benefits

- Possibility of doing this training course on your own site and at your own convenience
- Exchanges with an experienced instructor
- Real hands-on work on electrical equipment
- Practice in operating of the switchgear
- Immediate practice of the theoretical knowledge acquired
- Repair of minor failures
T001TC
Distribution transformers – Principles, installation, use and maintenance

Objectives
Know the Distribution Transformers functions.
Operate and maintain Distribution Transformers.

Course topics
- Presentation of FTR (France Transfo) factory
- The transformer
  - Principles and description
  - Technologies: Distribution immersed transformers, Distribution dry type transformers and Power transformer
- Installation, use, maintenance
- Manufacturing: detailed visits of our 2 factories

Audience
- Operating and maintenance technicians
- Installation team

Duration
3 days
80% Theoretical
20% Practical

Price
Contact us

Dates & Place
Contact us

Customer Benefits
- Exchanges with an experienced instructor
- Explanation on real product
**MICOM002**
MiCOM Px20 and Px40 Master Class

**Objectives**
Give a comprehensive overview of selected MiCOM Px20 and Px40 relays. Give a detailed insight into the MiCOM support software, MiCOM S1. Detail the relay construction, application, programming and communication.

**Course topics**
- Settings creation and upload/download
- Event extraction and interrogation
- Disturbance record extraction and interrogation
- Programmable Scheme logic creation and upload/download
- Measurements monitoring
- Menu Text editing

**Audience**
- All MiCOM Px20 and Px40 users

**Learning Path**

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<tr>
<td>Technicians and engineers from application or control departments, project managers, technicians or operators</td>
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</table>

**Customer Benefits**
- Possibility of doing this training course on your own site and at your own convenience
- Exchanges with an experienced instructor
- Real hands-on work on electrical equipment
- Typically, based on customer selected relays, the course will give a comprehensive insight into the product’s application in the field, its setting and methods of remote interrogation
- Includes in-depth training in the MiCOM relay setting software MiCOM S1
**MICOM004**  
MiCOM Px30 Master Class

### Objectives
Give a comprehensive overview of selected MiCOM Px30 relays.
Give a detailed insight into the MiCOM support software, MiCOM S1.
Detail the relay construction, application, programming and communication.

### Course topics
- Settings creation and upload/download
- Event extraction and interrogation
- Disturbance record extraction and interrogation
- Programmable Scheme logic creation and upload/download
- Measurements monitoring
- Menu Text editing

### Audience
- All MiCOM Px30 users

### Learning Path

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<td>MICOM002</td>
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### Customer Benefits
- Possibility of doing this training course on your own site and at your own convenience
- Exchanges with an experienced instructor
- Real hands-on work on electrical equipment
- Typically, based on customers selected relays, the course will give a comprehensive insight into the product’s application in the field, its setting and methods of remote interrogation
- Includes in-depth training on the MiCOM relay setting software MiCOM S1
Objectives
Teach the principles and application of railway protection.

Course topics
- Requirements for stream and tension converter for protection applications
- Basics of overcurrent applications
- Basic transformer-differential protection for feeder lines
- Basic distance protection facilities for overhead line arrangements
- Operating draft and operating programs
- Overcurrent protection mechanisms HP 492, MiCOM P138
- Transformer protection facilities PQ 792, MiCOM P638
- Overhead line protection facilities PD 591, MiCOM P436/P438
- Practical exercises with test facilities as well as settings about PC/notebook
- Exercises for the case evaluation with operating programs

Audience
- Engineers involved in the protection of railway electricity
- Technicians and engineers from application or control departments, project managers, technicians or operators

Customer Benefits
- Possibility of doing this training course on your own site and at your own convenience
- Exchanges with an experienced instructor
- Real hands-on work on electrical equipment
- Participants will have a thorough knowledge of maintaining their protection system
- Participants will increase their fault finding and troubleshooting abilities for the protection system, thus reducing plant shutdown
**Objectives**

Operate and maintain the MiCOM P12x and P14x overcurrent and feeder protection relay.

**Course topics**

- Reminder of overcurrent and feeder protection application
- P12x/P14x functionality
- Product characteristics
- Relay MMI: front panel, LEDs, push-buttons, navigation through front panel
- Alarms & acknowledgement
- MiCOM S1 software
- Parameter file creation, upload and download
- PSL file creation, upload and download
- Disturbance, fault, event records
- Detailed presentation of P12x/P14x functions
- Product connection
- Test with current injection
- P12x/P14x hardware
- Maintenance
- Hands-on

**Learning Path**

<table>
<thead>
<tr>
<th>Prerequisites</th>
<th>Training</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good knowledge of electrical substations</td>
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<tr>
<td>Good knowledge of overcurrent and feeder protection principles</td>
<td></td>
</tr>
<tr>
<td>Work with PC under Windows environment</td>
<td></td>
</tr>
</tbody>
</table>

**Audience**

- Electrical engineers, operators, maintenance engineers, protection design engineers

**Customer Benefits**

- Possibility of doing this training course on your own site and at your own convenience
- Exchanges with an experienced instructor
- Real hands-on work on electrical equipment
- Participants will be able to operate and carry out maintenance on MiCOM P12x/P14x
- Participants can test the various functions of MiCOM P12x/P14x
Objectives
Operate and maintain the MiCOM P22x and P24x motor protection relay.

Course topics
- Reminder of motor protection application
- P22x/P24x functionality
- Product characteristics
- Relay MMI: front panel, LEDs, push-buttons, navigation through front panel
- Alarms & acknowledgement
- MiCOM S1 software
- Parameter file creation, upload and download
- PSL file creation, upload and download
- Disturbance, fault, event records
- Detailed presentation of P22x/P24x functions
- Test with current injection
- P22x/P24x hardware
- Maintenance
- Hands-on

Audience
- Electrical engineers, operators, maintenance engineers, protection design engineers

Learning Path

<table>
<thead>
<tr>
<th>Prerequisites</th>
<th>Training</th>
<th>Next Step</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good knowledge of electrical substations</td>
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<tr>
<td>Good knowledge of motor protection principles</td>
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<tr>
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<tr>
<td></td>
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<td>MICO121</td>
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</tbody>
</table>

Customer Benefits
- Possibility of doing this training course on your own site and at your own convenience
- Exchanges with an experienced instructor
- Real hands-on work on electrical equipment
- Participants can operate and carry out maintenance on MiCOM P22x/P24x
- Participants can test the various functions of MiCOM P22x/P24x
Objectives
Operate and maintain the MiCOM P34x generator protection relay.

Course topics
- Reminder of generator protection application
- P34x functionality
- Product characteristics
- Relay MMI: front panel, LEDs, push-buttons, navigation through front panel
- Alarms & acknowledgement
- MiCOM S1 software
- Parameter file creation, upload and download
- PSL file creation, upload and download
- Disturbance, fault, event records
- Detailed presentation of P34x functions
- Product connection
- Test with current injection
- P34x hardware
- Maintenance
- Hands-on

Audience
- Electrical engineers, operators, maintenance engineers, protection design engineers

Duration
3 days
30% Theoretical
70% Practical

Price
Contact us

Dates & Place
Contact us

Learning Path

<table>
<thead>
<tr>
<th>Prerequisites</th>
<th>Training</th>
<th>Next Step</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good knowledge of electrical substations</td>
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</tr>
<tr>
<td>Good knowledge of generator and protection principles</td>
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<tr>
<td>Work with PC under Windows environment</td>
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<td>MICOM122</td>
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</tbody>
</table>

Customer Benefits
- Possibility of doing this training course on your own site and at your own convenience
- Exchanges with an experienced instructor
- Real hands-on work on electrical equipment
- Participants will be able to operate and carry out maintenance on MiCOM P34x
- Participants can test the various functions of MiCOM P34x
Objectives

- Operate and maintain the MiCOM P44x distance protection relay.

Course topics

- Reminder of distance protection application
- P44x functionality
- Product characteristics
- Relay MMI: front panel, LEDs, push-buttons, navigation through front panel
- Alarms & acknowledgement
- MiCOM S1 software
- Parameter file creation, upload and download
- PSL file creation, upload and download
- Disturbance, fault, event records
- Detailed presentation of P44x functions
- Product connection
- Test with current injection
- P44x hardware
- Maintenance
- Hands-on

Audience

- Electrical engineers, operators, maintenance engineers, protection design engineers

Learning Path

<table>
<thead>
<tr>
<th>Prerequisites</th>
<th>Training</th>
<th>Next Step</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good knowledge of electrical substations</td>
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<tr>
<td>Good knowledge of distance protection principles</td>
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<tr>
<td>Work with PC under Windows environment</td>
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</tbody>
</table>

Customer Benefits

- Possibility of doing this training course on your own site and at your own convenience
- Exchanges with an experienced instructor
- Real hands-on work on electrical equipment
- Participants can operate and carry out maintenance on MiCOM P44x
- Participants can test the various functions of MiCOM P44x
Objectives
Operate and maintain the MiCOM P52x and P54x line differential protection relay.

Course topics
- Reminder of line differential protection application
- P52x/P54x functionality
- Product characteristics
- Communication between relays
- Relay MMI: front panel, LEDs, push-buttons, navigation through front panel
- Alarms & acknowledgement
- MiCOM S1 software
- Parameter file creation, upload and download
- PSL file creation, upload and download
- Disturbance, fault, event records
- Detailed presentation of P52x/P54x functions
- Product connection
- Test with current injection
- P52x/P54x hardware
- Maintenance
- Hands-on

Audience
- Electrical engineers, operators, maintenance engineers, protection design engineers

Learning Path

<table>
<thead>
<tr>
<th>Prerequisites</th>
<th>Training</th>
<th>Next Step</th>
</tr>
</thead>
<tbody>
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<td>Good knowledge of differential protection principles</td>
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<tr>
<td>&gt;</td>
<td>MICOM124</td>
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</tbody>
</table>

Customer Benefits
- Possibility of doing this training course on your own site and at your own convenience
- Exchanges with an experienced instructor
- Real hands-on work on electrical equipment
- Participants will be able to operate and carry out maintenance on MiCOM P52x/P54x
- Participants can test the various functions of MiCOM P52x/P54x
Objectives
Operate and maintain the MiCOM P92x and P94x voltage and frequency protection relay.

Course topics
- Reminder of voltage and frequency protection application
- P92x/P94x functionality
- Product characteristics
- Relay MMI: front panel, LEDs, push-buttons, navigation through front panel
- Alarms & acknowledgement
- MiCOM S1 software
- Parameter file creation, upload and download
- PSL file creation, upload and download
- Disturbance, fault, event records
- Detailed presentation of P92x/P94x functions
- Product connection
- Test with current injection
- P92x/P94x hardware
- Maintenance
- Hands-on

Audience
- Electrical engineers, operators, maintenance engineers, protection design engineers

Learning Path
<table>
<thead>
<tr>
<th>Prerequisites</th>
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<td>protection principles</td>
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<td></td>
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<tr>
<td>Work with PC under Windows environment</td>
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</table>

Customer Benefits
- Possibility of doing this training course on your own site and at your own convenience
- Exchanges with an experienced instructor
- Real hands-on work on electrical equipment
- Participants will be able to operate and carry out maintenance on MiCOM P92x/P94x
- Participants can test the various functions of MiCOM P92x/P94x
Objectives
Operate and maintain the MiCOM P63x differential transformer protection device.

Course topics
- Reminder of transformer protection application
- P63x functionality
- Product characteristics
- Relay MMI: front panel, LEDs, push-buttons, navigation through front panel
- Alarms & acknowledgement
- MiCOM S1 software
- Parameter file creation, upload and download
- Disturbance, fault, event records
- Detailed presentation of P63x functions
- Product connection
- Test with current injection
- P63x hardware
- Maintenance
- Hands-on

Audience
- Electrical engineers, operators, maintenance engineers, protection design engineers

Learning Path
<table>
<thead>
<tr>
<th>Prerequisites</th>
<th>Training</th>
<th>Next Step</th>
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<tbody>
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<tr>
<td>Good knowledge of power transformer protection principles</td>
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<td></td>
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<tr>
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<td>MICOM127</td>
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</table>

Customer Benefits
- Possibility of doing this training course on your own site and at your own convenience
- Exchanges with an experienced instructor
- Real hands-on work on electrical equipment
- Participants will be able to operate and carry out maintenance on MiCOM P63x
- Participants can test the various functions of MiCOM P63x
Objective
Operate and maintain the MiCOM P437 distance protection device.

Course topics
- Reminder of distance protection application
- P437 functionality
- Product characteristics
- Relay MMI: front panel, LEDs, push-buttons, navigation through front panel
- Alarms & acknowledgement
- MiCOM S1 software
- Parameter file creation, upload and download
- Disturbance, fault, event records
- Detailed presentation of P437 functions
- Product connection
- Test with current injection
- P437 hardware
- Maintenance
- Hands-on

Audience
- Electrical engineers, operators, maintenance engineers, protection design engineers

Duration
3 to 5 days
30% Theoretical
70% Practical

Price
Contact us

Dates & Place
Contact us

Learning Path
<table>
<thead>
<tr>
<th>Prerequisites</th>
<th>Training</th>
<th>Next Step</th>
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</thead>
<tbody>
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<tr>
<td>Good knowledge of distance protection principles</td>
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<td></td>
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<tr>
<td>Work with PC under Windows environment</td>
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</tbody>
</table>

Customer Benefits
- Possibility of doing this training course on your own site and at your own convenience
- Exchanges with an experienced instructor
- Real hands-on work on electrical equipment
- Participants can operate and carry out maintenance on MiCOM P437
- Participants can test the various functions of MiCOM P437

Contact us
Objectives
Operate and maintain the MiCOM P139 feeder protection device.

Course topics
- Reminder of P139 application
- P139 functionality
- Product characteristics
- Relay MMI: front panel, LEDs, push-buttons, navigation through front panel
- Alarms & acknowledgement
- MiCOM S1 software
- Parameter file creation, upload and download
- Disturbance, fault, event records
- Detailed presentation of P139 functions
- Product connection
- Test with current injection
- Control box/selection/creation of bay
- P139 hardware
- Maintenance
- Hands-on

Audience
- Electrical engineers, operators, maintenance engineers, protection design engineers

Learning Path

<table>
<thead>
<tr>
<th>Prerequisites</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Good knowledge of electrical substations</td>
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<td></td>
</tr>
<tr>
<td>Work with PC under Windows environment</td>
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</tbody>
</table>

Customer Benefits
- Possibility of doing this training course on your own site and at your own convenience
- Exchanges with an experienced instructor
- Real hands-on work on electrical equipment
- Participants will be able to operate and carry out maintenance on MiCOM P139
- Participants can test the various functions of MiCOM P139
Objectives
Operate and maintain the MiCOM P74x digital differential busbar protection system.

Course topics
- Reminder of P74x application
- Reminder of busbar protection application
- P74x functionality
- P74x system architecture, presentation of the different modules, communication between modules
- System characteristics
- Topology: principles, examples, configuration, virtual feeder
- Module MMI: front panel, LEDs, push-buttons, navigation through front panel
- Alarms & acknowledgement
- MiCOM S1 software
- Parameter file creation, upload and download
- PSL file creation, upload and download
- Disturbance, fault, event records
- Detailed presentation of P74x functions
- Product connection
- Test with current injection
- P74x hardware
- Maintenance
- Hands-on

Audience
- Electrical engineers, operators, maintenance engineers, protection design engineers

Learning Path

<table>
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<tr>
<th>Prerequisites</th>
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<td>Good knowledge of electrical substations</td>
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<tr>
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<td></td>
</tr>
<tr>
<td>Work with PC under Windows environment</td>
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</tbody>
</table>

Customer Benefits
- Possibility of doing this training course on your own site and at your own convenience
- Exchanges with an experienced instructor
- Real hands-on work on electrical equipment
- Participants will be able to operate and carry out maintenance on MiCOM P74x system
- Participants can test the various functions of MiCOM P74x system
- Participants will have reached a good level of knowledge on busbar protection principles
Objectives
Operate and maintain the MiCOM P438 railway distance protection device.

Course topics
- Reminder of P438 application
- Reminder of the specific characteristics of railway protection applications
- P438 functionality
- Product characteristics
- Relay MMI: front panel, LEDs, push-buttons, navigation through front panel
- Alarms & acknowledgement
- MiCOM S1 software
- Parameter file creation, upload and download
- Disturbance, fault, event records
- Detailed presentation of P438 functions
- Product connection
- Test with current injection
- P438 hardware
- Maintenance
- Hands-on

Audience
- Electrical engineers, operators, maintenance engineers, protection design engineers

Duration
3 to 5 days
30% Theoretical
70% Practical

Price
Contact us

Dates & Place
Contact us

Learning Path
<table>
<thead>
<tr>
<th>Prerequisites</th>
<th>Training</th>
<th>Next Step</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good knowledge of electrical substations</td>
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<tr>
<td>Good knowledge of railway protection principles</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work with PC under Windows environment</td>
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</tbody>
</table>

Customer Benefits
- Possibility of doing this training course on your own site and at your own convenience
- Exchanges with an experienced instructor
- Real hands-on work on electrical equipment
- Participants will be able to operate and carry out maintenance on MiCOM P438
- Participants can test the various functions of MiCOM P438
Objectives
Implement, use and commission Sepam 20, 40 and 80. Know each Sepam Serie in details.

Course topics
- Sepam offer presentation
- Installation of module presentation
- Understand Sepam control logic
- Use parameter setting software SFT2841
- Customize the control logic with Equation Editor
- Understand and use Sepam UMI
- Logipam introduction
- Configure and test Sepam 20, 40 and 80 from case study

Audience
- Product Application Engineers
- Services or Technical Support Protection team
- Protection engineers

Learning Path

<table>
<thead>
<tr>
<th>Prerequisites</th>
<th>Training</th>
</tr>
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<tbody>
<tr>
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</tbody>
</table>

Customer Benefits
- Possibility of doing this training course on your own site and at your own convenience
- Exchanges with experienced instructors
- Get used to Sepam protection range
- Be able to select and implement Sepam in your application
- Optimize your automation application and related cost

SEP01
Sepam Master Class

Duration
4 days
70% Theoretical
30% Practical

Price
Contact us

Dates & Place
Contact us

Duration
4 days
70% Theoretical
30% Practical

Price
Contact us

Dates & Place
Contact us
**SEPO2**

**Sepam 80 Expert**

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**Objectives**

- Know the advanced features of the Sepam series 80.
- Use and implement advanced functions of Sepam series 80.
- Use advanced control logic.
- Create a complete control logic with Logipam software.
- Create and customize the mimic editor.

**Course topics**

- Understand advanced UMI
- Use advanced functions of SFT 2841
- Understand and use the advanced control logic (Automatic Transfer Scheme)
- Practical example and exercises
  - Customize the control logic (SFT2885)
  - Customize the Mimic (Mimic editor)
  - Customization using the Equation Editor
  - Practice with the Mimic editor and the Logipam, tested with a Sepam 80

**Audience**

- Protection Application Engineers
- Services or Tech Support Protection team
- Protection engineers

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**Duration**

3 days
30% Theoretical
70% Practical

**Price**

Contact us

**Dates & Place**

Contact us

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**Learning Path**

<table>
<thead>
<tr>
<th>Prerequisites</th>
<th>Training</th>
<th>Next Step</th>
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<tbody>
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<td>SEPO2</td>
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</tbody>
</table>

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**Customer Benefits**

- Possibility of doing this training course on your own site and at your own convenience
- Exchanges with experienced instructors
- Get used to the Sepam protection range
- Be able to select and implement Sepam in your application
- Optimize your automation application and related cost
Objectives

Get used to the configuration and the commissioning of IEC 61850 for the Sepam range.
Understand the IEC 61850 protocol.

Course topics

- Ethernet TCP/IP overview
- Discover the IEC 61850 protocol
- IEC 61850 level 1 solutions
- IEC 61850 level 2 solutions (GOOSE)
- Ethernet architecture recommendations
- Customize SCL files
- Control operation with IEC 61850

Audience

- Communication engineers
- Product Application Engineers
- Services or Tech Support Protection team
- System integrators

Duration

5 days
50% Theoretical
50% Practical

Price
Contact us

Dates & Place
Contact us

Learning Path

<table>
<thead>
<tr>
<th>Prerequisites</th>
<th>Training</th>
<th>Next Step</th>
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</thead>
<tbody>
<tr>
<td>SEP01</td>
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<td>SEP04</td>
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</tbody>
</table>

Customer Benefits

- Possibility of doing this training course on your own site and at your own convenience
- Exchanges with experienced instructors
- Take full advantage of this communication protocol which is now the standard for our industry
Objectives
Know the advanced features of the Sepam series 60.
Use and implement Sepam series 60.
Use control logic.
Create a complete control logic with Logipam software.
Create and customize the mimic editor.

Course topics
- Use advanced functions of SFT 2841
- Customize the control logic (SFT2885)
- Practical example and exercises
- Practice with the Logipam software and tested with a Sepam 60

Audience
- Protection Application Engineers
- Services or Tech Support Protection team
- Protection engineers

Learning Path

<table>
<thead>
<tr>
<th>Prerequisites</th>
<th>Training</th>
<th>Next Step</th>
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<tbody>
<tr>
<td>SEP01</td>
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</table>

Customer Benefits
- Possibility of doing this training course on your own site and at your own convenience
- Exchanges with experienced instructors
- Get a deep understanding of the Sepam 60 and related software
- Optimize your automation application and related cost
DCS006
MiCOM C264: Compact RTU (Remote Terminal Unit)

Objectives
Understand and use the compact RTU MiCOM C264. Understand how the new compact RTU allows decentralized control and monitoring.

Course topics
- New functionalities of the compact RTU
- The MiCOM C264: field area/functionality/architecture
- RTU: hardware and software architecture
- Man Machine Interface
- Configuration tools
- Maintenance: 1st level/error messages
- Hands-on

Audience
- Technicians and engineers from design or control departments, project managers, operation/maintenance technicians

Learning Path
<table>
<thead>
<tr>
<th>Prerequisites</th>
<th>Training</th>
<th>Next Step</th>
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<tr>
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<td>Good knowledge of Windows</td>
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<tr>
<td>Technician or engineer level</td>
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</table>

Customer Benefits
- Possibility of doing this training course on your own site and at your own convenience
- Exchanges with an experienced instructor
- Real hands-on work on electrical equipment
- A good presentation of MiCOM C264 applied to RTU applications: the main structure of this system and explanations of the features available with this solution are shown in it
- Gives operation and maintenance teams autonomy in their daily jobs
- Control Function in OBS (One Box Solution) and Bay Computer Devices, Basic Digital Control Systems
**Objectives**

Give an overview of the architecture and the task setting within the digital control system environment.
Understand what a digital control system is.
Have a good understanding of PACiS solution, as well as on the functional capability, operation and maintenance point of view.

**Course topics**

- Introduction to digital control system (DCS)
- Global overview of DCS: architecture, communication principles, IEDs, bay computers, gateways, Operator Interface
- Introduction to IEC 61850 communication standard
- DCS specification principles
- Architecture examples
- PACiS architecture, elements, communication principles, operation principles
- PACiS tools
- MiCOM C264 bay computer
- PACiS Operator Interface, alarm, control, security
- PACiS maintenance Tools and process
- Hands-on

**Audience**

- Technicians and engineers from design or control departments, project managers, operation & maintenance staff managers

**Learning Path**

<table>
<thead>
<tr>
<th>Prerequisites</th>
<th>Training</th>
<th>Next Step</th>
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<td>Electrical substation knowledge</td>
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<tr>
<td>Technician or engineer level</td>
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</table>

**Customer Benefits**

- Possibility of doing this training course on your own site and at your own convenience
- Exchanges with an experienced instructor
- Real hands-on work on electrical equipment
- Brings key knowledge on digital control systems
- Gives the necessary knowledge to understand the corresponding advantages and application, applied on PACiS
- Gives an overview of operation & maintenance in a PACiS system
Objectives
Learn the basics of PACiS.
Provide an overview of PACiS architecture and components focusing on PACiS Operator Interface and how to operate the system.

Course topics
- PACiS architecture, elements, communication principles, operation principles
- PACiS Operator Interface, screen views, alarm, log, control, command, security
- Hands-on at PACiS Operator Interface
- MiCOM C264 bay computer
- Hands-on with MiCOM C264
- Maintenance level 1

Audience
- Operators, electrical staff of PACiS system

Learning Path

<table>
<thead>
<tr>
<th>Prerequisites</th>
<th>Training</th>
<th>Next Step</th>
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<tbody>
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<td>DCS009</td>
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</table>

Customer Benefits
- Possibility of doing this training course on your own site and at your own convenience
- Exchanges with an experienced instructor
- Real hands-on work on electrical equipment
- Participants will be able to operate the PACiS system
DCS009
PACiS Protection Automation & Control – Architecture, Operation & Maintenance

Objectives
Learn how to use PACiS.
Gain an overview of various subjects allowing participants to understand the PACiS Integrated Solution.
Learn how to operate, define the subsets and carry out maintenance on the system.

Course topics
- Introduction to the Digital Control System
- Field area/functionabilities/architecture
- PACiS Operator Interface: Man Machine Interface/Alarms monitoring/Control/Security
- C264 bay computer: functionalities/hardware overview/maintenance troubleshooting & commissioning
- Data base of the system/process configuration/configuration editor/data base management
- PACiS Gateway for SCADA communication
- Hands-on

Audience
- Technicians and engineers from design or control departments, project managers, operation/maintenance technicians

Duration
5 days
50% Theoretical
50% Practical

Price
Contact us

Dates & Place
Contact us

Customer Benefits
- Possibility of doing this training course on your own site and at your own convenience
- Exchanges with an experienced instructor
- Real hands-on work on electrical equipment
- Provides the knowledge necessary to understand the advantages and application of the PACiS digital control system
- Gives operation and maintenance teams autonomy in their daily jobs

Learning Path

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<td>DCS008 Electrotechnical and operation</td>
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<tr>
<td>in substation basics</td>
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<tr>
<td>Good knowledge of Windows</td>
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<tr>
<td>Technician or engineer level</td>
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Price
Contact us

Dates & Place
Contact us
Objectives
Operate the IEC 61850 communication facility from MiCOM Px30 & Px40 series. Be able to use the IED Configurator tool from MiCOM S1 Studio.

Course topics
- Basic knowledge of IEC 61850 focusing on protection engineering & field engineers needs
- Service, modeling, network architectures, configuration files, time synchronization, Goose and Reports, controls
- Hands-on
  - IED Configurator use
  - Scl file management
  - Protection relay identification and basic parameters
  - Time synchronization management
  - Protection relay data model through the documentation
  - Data Set creation
  - Report Control Blocks use
  - Goose configuration
  - Control configuration

Audience
- Technicians and engineers from design or control departments, Protection engineering staffs, Commissioning engineers

Learning Path

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<tr>
<td>Experience in MiCOM S1 Studio software</td>
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Customer Benefits
- Possibility of doing this training course on your own site and at your own convenience
- Exchanges with an experienced instructor
- Real hands-on work on electrical equipment
EASER02
Configuration of the Easergy range

Objectives
Learn how to install, operate, configure or repair equipment from the Easergy range (Flite/Flair/G200/T200/L500).

Course topics
- Easergy T200I: overview, installation, connection, commissioning, operation, maintenance
- Easergy T200P: installation, commissioning
- Easergy L500: installation, Easergy configuration tool, Easergy supervisor, personalization of applications, tips and tricks
- Easergy G200/Flite 116-SA: overview, installation, commissioning
- Easergy Flair 200C: overview, installation, connection, commissioning, operation

Audience
- Project engineers
- Field services installation
- Operation or maintenance team of electrical facilities

Learning Path

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<tr>
<th>Prerequisites</th>
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<td>Principles of Medium Voltage network operation</td>
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<tr>
<td>Principles of communication (DNP3, Modbus, etc.), and media (GSM, RS232, Radio, etc.)</td>
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Customer Benefits
- Possibility of doing this training course on your own site and at your own convenience
- Exchanges with an experienced instructor
- Real hands-on work on electrical equipment
- Sustain the success of your business by enhancing employee efficiency and morale
- Reinforce your company’s expert knowledge
- Gain the confidence to maintain your system
Objectives
Learn how to install, operate, configure or repair iRio/XFlow/Kerwin equipment.

Course topics
- iRio/XFlow
  - Overview, installation, connection
  - Commissioning: setting up the RTU via the Web interface
  - Operation: monitoring, alarm acknowledgment, control
  - Maintenance
  - Off-line configuration
- Kerwin
  - Overview, installation of the Kerwin software
  - Configuration: communication, histories, graphics, block diagrams, etc.
  - Operation

Audience
- Project engineers
- Field services installation
- Operation of PV, Wind, Hydro or EE facilities

Learning Path

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Customer Benefits
- Possibility of doing this training course on your own site and at your own convenience
- Exchanges with an experienced instructor
- Real hands-on work on electrical equipment
- Increase your capacity and autonomy in operating Kerwin
- React quickly when evolutions are needed
- Reinforce your maintenance capacity to minimize system down-time
### Operation & Maintenance

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<tr>
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<td>Withdrawable SF₆ Gas switchboards DNF type – Operation &amp; maintenance</td>
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<td>Sepam Protection Principles</td>
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<td>Substations Control</td>
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<td>PACIS Protection Automation &amp; Control – Architecture, operation, maintenance, basic configuration</td>
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<td>SPACE 2000 Digital Control System</td>
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