



**Grid Solutions**  
a GE and Alstom joint venture

AUTOMATION SUPPORT AND SERVICES SOLUTIONS

# Support and Services Training

Keeping up-to-date with the latest technological advances in system protection and control – whether in fully automated environments or not – is crucial to optimal performance. This is where Grid Automation trainings become a key success factor

## A complete range of training courses tailored to your needs

The performance of your power system network depends to a great extent on the skills of the people managing and operating it. The better they understand what is happening, the faster and more efficiently they can assess the situation, avoid critical conditions and optimise your investment. Training is an essential factor in attaining these skills.

Our Technical Institutes provide a host of professional training courses related to substation automation solutions in power transmission, distribution and industrial applications. Training courses include specific hands-on sessions provided by our experienced trainers.

Each training solution is designed for a specific audience: electrical engineers, operators, maintenance engineers, protection design engineers and technical leaders.

### KEY BENEFITS

- Exchange with highly experienced trainers and Grid Automation engineers
- Improve employee efficiency and enhance network performance
- Develop in-depth knowledge of all protection and system capabilities to optimise network operability
- Reinforce onsite expertise and consequently, reduce maintenance costs and downtime
- Customized training at your site and at your convenience



## NEEDS-BASED TRAINING

Grid Automation offers an exhaustive range of classroom and hands-on training courses in protection and substation control. These courses provide a comprehensive curriculum on: power systems analysis, system protection principles, applications, settings, testing, commissioning, analysis of disturbance data and failure management. They also give trainees the ability to reinforce their understanding of protection schemes for industrial, distribution and transmission networks, as well as for generators and the digital control systems for HV/MV substations. Having acquired these skills, your staff will be better able to deal with unpredictable incidents and take appropriate actions in a timely manner to ensure efficient operations.



## STANDARD OR CUSTOMIZED TRAINING

Grid Automations' protection and substation control training is modular in design, allowing trainees to benefit from a standard course that is built from tried-and-tested and constantly improving modules. Alternatively, you can opt for a course that is fully adapted to your specific needs, your schedule and your technical and financial constraints. Our dedicated training centre experts and consultants analyze your requirements and adapt the teaching material accordingly, incorporating examples and exercises tailored specifically to your needs.



Customized training takes place either at our training facilities or at your site. In addition, Grid Automation can manage all the logistics, such as hotel bookings, local transportation, etc.

## LONG TERM VISION TRAINING

In order to address the needs for continuous education of such a large population our training centers annually define a calendar of scheduled courses, open to all our customers.

A training program can be defined with you to bring your technical team up to the required expertise level. After the training modules and via an assessment process, we can readjust the ensuing training content to allow trainees to progress according to the most suitable and optimised schedule in order to reach the expected expertise level.



Starting from fundamental courses through to practical ones, our experienced trainers will guide trainees, emphasizing specific substation automation products and systems operability knowledge.

As part of the upgrade process, our training centers prepare recommendations for additional training to achieve proper knowledge transfer on upgraded functions and new features.

Furthermore, trainees can be involved, on request, in "On the Job Training" related to their main ongoing projects in order to get levels of autonomy in phase with project execution.



With a large range of courses in different languages, Grid Automation offers customized trainings tailored to your needs.

## A TRAINING PORTFOLIO TO SUIT ALL REQUIREMENTS

Technical Institutes boast a portfolio of more than 40 courses on power systems equipment operations, maintenance, protection and control. They are aimed at a variety of levels and roles and based on your skills requirements. Around 6,000 trainee days are delivered per year related to substation automation system and product ranges. The different training courses available include:

### Power systems analysis and protection – fundamentals and advanced sessions

- Utility transmission power system protection
- Motor generators and transformer protection
- Line and cable protection
- Network stability
- Commissioning and maintenance procedures and practices
- Fault analysis

### Protection and control

- MiCOM range (P14x Agile, P24x, P34x, P44x, P50, P60, P54X P64x, P74x, P84x, P94V, C264, M57x, M87x,etc.) - operate and maintain MiCOM relays
- IEC 61850 communications protocol configuration and applications
- Legacy product (K-series, L-series)- relay functionalities, settings, operations and maintenance

### Substation control system

- Grid Automation Digital Control System (DCS), DS Agile and DAPserver – architecture, operations, maintenance and basic configuration
- Application of IEC 61850 communications protocol
- SPACE 2000 – configuration, operations and maintenance
- PSCN 3020 – configuration, operations and maintenance

### Protection

Protection training is delivered to electrical engineers, operators, maintenance engineers and protection design engineers who need a good knowledge of electrical substations and protection principles. The objectives, depending on the training session modules, are mainly:

- Analyse the faults that may occur in these installations
- Estimate the value of short circuit currents, define the main protection systems and their settings and provide a comprehensive overview of Grid Automation relays
- Provide detailed insights into MiCOM support software, MiCOM S1 Agile
- Detail the relays' construction, applications, settings and communications
- Operate and maintain MiCOM relays: alarms and acknowledge, parameter upload and download, programmable scheme logic creation, product connection, measurement, monitoring and tests with current injection

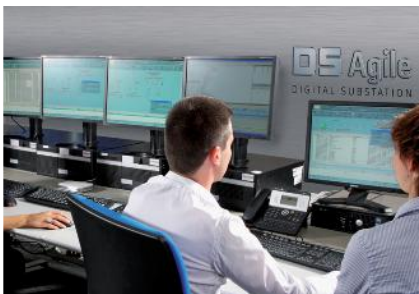
### Digital control system (DCS)

DCS training is delivered to substation control system engineers, technicians, decision-making managers and project managers.

Its main objectives are to:

- Give an overview of the architecture and the task settings within the digital control system environment
- Show the relevance and impact of control and protection and remote control functions
- Refresh electrical energy fundamentals knowledge
- Train on the theory and applications within substation control and explain protocols in the substation automation and communications structures and norms with data models and services
- Understand and use Grid Automation RTUs in terms of new functionalities, architecture, MMI, configuration tools and maintenance
- Train on DS Agile, DAPserver or legacy systems architecture and components, focusing on the operator interface and how to operate the system. Define subsets and make modifications in the substation settings files and carry out system maintenance

For legacy systems we continue to deliver training: software and hardware descriptions, architecture, communication with IEDs, graphic tools, data modification, automatism and download, gateway with SCADA, 1st level maintenance as well as hands-on.



## GRID AUTOMATION TECHNICAL INSTITUTES

In order to be close to our customers, dedicated training centres for substation automation are located around the globe: United Kingdom (Stafford), France (Montpellier), India (Chennai), United Arab Emirates (Dubai) and Brazil (Sao Paulo). This geographical spread provides ideal opportunities for customers to enhance their skills and knowledge locally. All facilities are widely acknowledged as best-in-class for the quality of the training they deliver.

The training centers are totally flexible in meeting trainee needs, offering standard courses or customised training based on specific situations, either in the training center itself or at your site.

You can get advice and further details by getting in touch with the Grid Automation contact in your region or the 24/7 worldwide Contact Center.

Whatever your choice, by signing up for a Grid Automation training course, you will give your staff a better understanding of your equipment and its underlying technology, enabling them to make the right decisions at the right time.

For more information please contact  
GE Grid Solutions

### Worldwide Contact Center

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