

Siemens Power Academy TD – Being Ahead

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The required technical options should therefore
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www.siemens.com/power-academy-td

Main catalog with international English training offers of Siemens Power Academy TD
2008/2009

Answers for energy.

SIEMENS

Welcome to the Siemens Power Academy TD



We are happy to see you are interested in the Siemens Power Academy TD's training services. This catalog contains all the training events in the fields of power transmission and distribution that are held in English.

Our English main catalog as well as our additional regional catalogs give you an overview over our comprehensive training services.

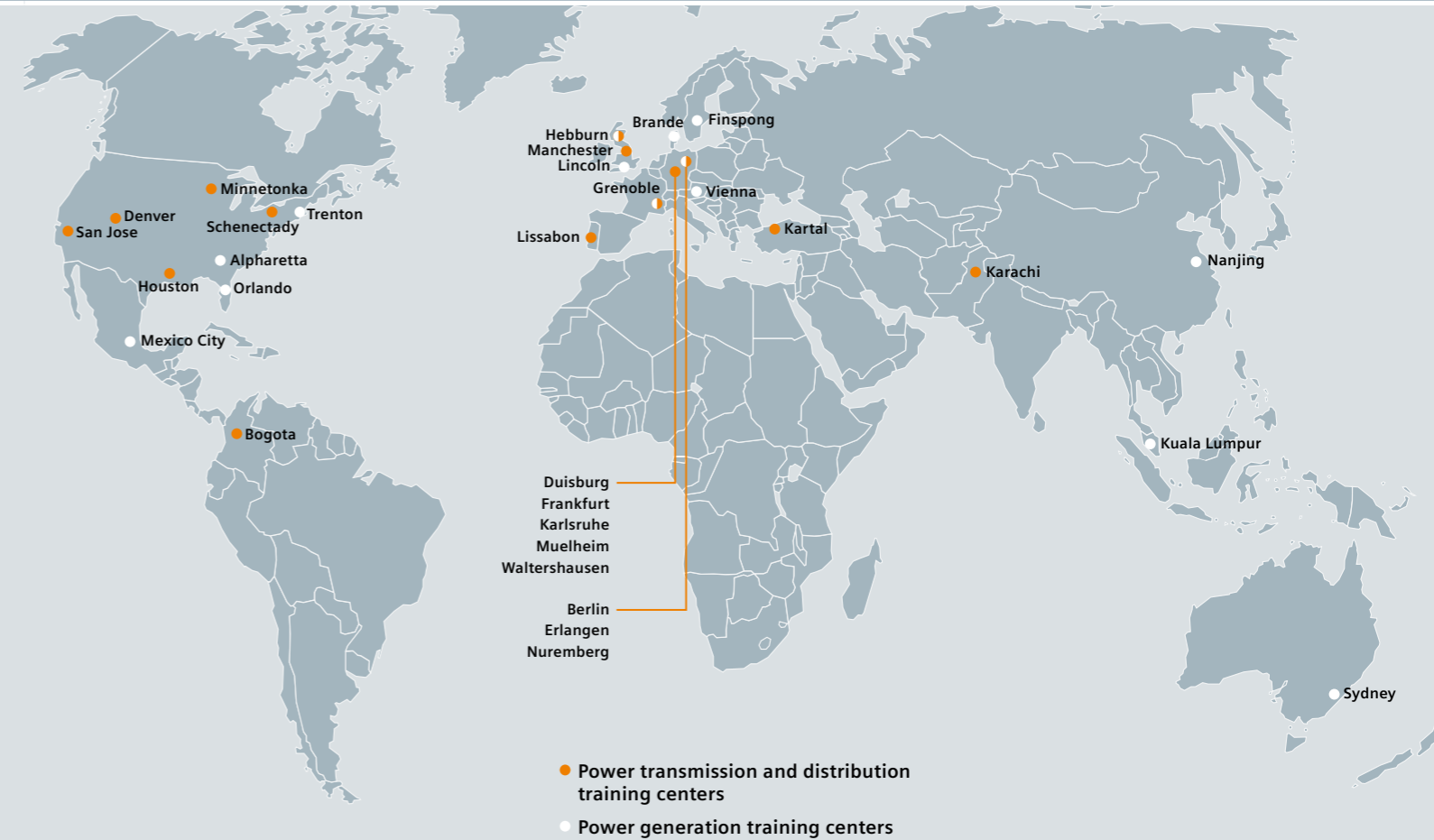
The Siemens Power Academy TD also offers training events in Spanish, French and German. If you are interested in any of these, you will find all the information you need for ordering our services on this page.

Further information on what the Siemens Power Academy TD has to offer is available in the Internet under www.siemens.com/power-academy-td

Main catalog – English

Contains all training services in English language worldwide

Order number: E50001-G730-A106-X-4A00



- Power transmission and distribution training centers
- Power generation training centers



Regional catalog – German

For usage in Europe's parts with German language

Order number: E50001-G730-A114



Regional catalog – English

For usage in the USA

Contact: pti-edpro.ptd@siemens.com



Regional catalog – Spanish

For usage in Spanish South America, e.g. Ecuador

Contact: service-andina.ptd@siemens.com

The Siemens Power Academy offers a comprehensive program of professional training events in the fields of power generation, distribution and transmission at 31 training centers around the world. Choose the events and locations that suit you best from our extensive program. If you like, we can also train your employees on your own premises.

Our training center staff will be happy to help you to choose the best training events for your needs at the most convenient location. You will find a complete overview of our people to contact in the Internet under www.siemens.com/power-academy



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Training is the Key to Success

System availability and reliability are of utmost importance for power solution providers and purchasers alike. Deregulation around the world is confronting all players on the global market with a further challenge. In this tough environment, being successful depends more than ever on staying competitive.

Highly-skilled, well-trained employees are the key to ongoing success. It is their knowledge and experience that powers the development and implementation of innovative products and solutions. At Siemens Power Academy TD, your employees can choose between one-off training sessions and whole training programs. Our Sales staff will be happy to help you to put together training programs tailored to your specific needs.

The Siemens Power Academy TD offers you training solutions along the entire power conversion chain. Whether you need training for commissioning engineers, control room operators, maintenance and repair personnel or systems engineers, the Siemens Power Academy TD offers you a full range of product-related training events. Profit from Siemens' over 160 years of global experience!





Tailor-made Solutions for Training Services in the Energy Transmission and Distribution Business

Customer-specific products and solutions call for customized training. The Siemens Power Academy TD's range of training events can be tailored to your needs and wishes. We make your training schedule versatile. You can combine various locations and methods to maximize the impact of your training efforts.

Training services

This catalog offers you an overview and explanations on the comprehensive standard training services and certification programs (Curriculum) of Siemens Power Academy TD. Additionally, we offer you tailor-made special training – based on your needs.

For your participation in our training programs, you will get a certificate. Your participation in one of our certification programs will be affirmed with a certified degree, depending on its level.

Modularized training

Fine-tune the content of your training programs by combining selected modules. We will be glad to support you in selecting and arranging the training units you need.

Blended learning

We offer you all necessary training modules for your success. No matter whether you seek for an advanced training, comprehensive qualification or simply to refresh your knowledge by repeating seminars.

Certification and qualification

Develop your people toward defined long-term qualification targets and profit from your employees' know-how at the certified knowledge levels of Associate, Advanced and Expert.





Our Experts are Your Coaches

The Siemens Power Academy TD builds on Siemens' long years of experience in the fields of power generation, transmission and distribution. We put our experts alongside your employees as coaches. We offer you apprenticed as well as certified main-trainers and top experts from our operating business standing at your service for special topics around the transmission and the distribution of energy. That way you can rest assured that your employees are effectively trained and coached.

The personal knowledge of our coaches is backed up by the learning environment at our training centers. We focus on product-related training on real-life objects. Your employees practice on the latest Siemens products and solutions, and it goes without saying that we employ realistic simulation methods wherever appropriate. Of course we also offer selected training events on the use/application of products that are still in service but for which product discontinuation has already been announced.

All courses are didactically and methodologically rehashed and consequently supported by the usage of equipment, scripts, slides and documents.

We take care of the organization, so you and your staff can concentrate fully on course content.

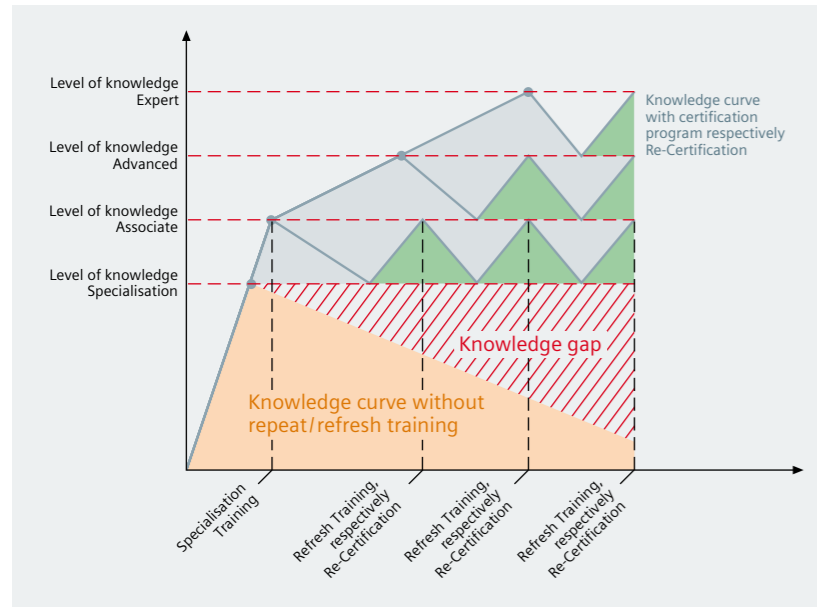




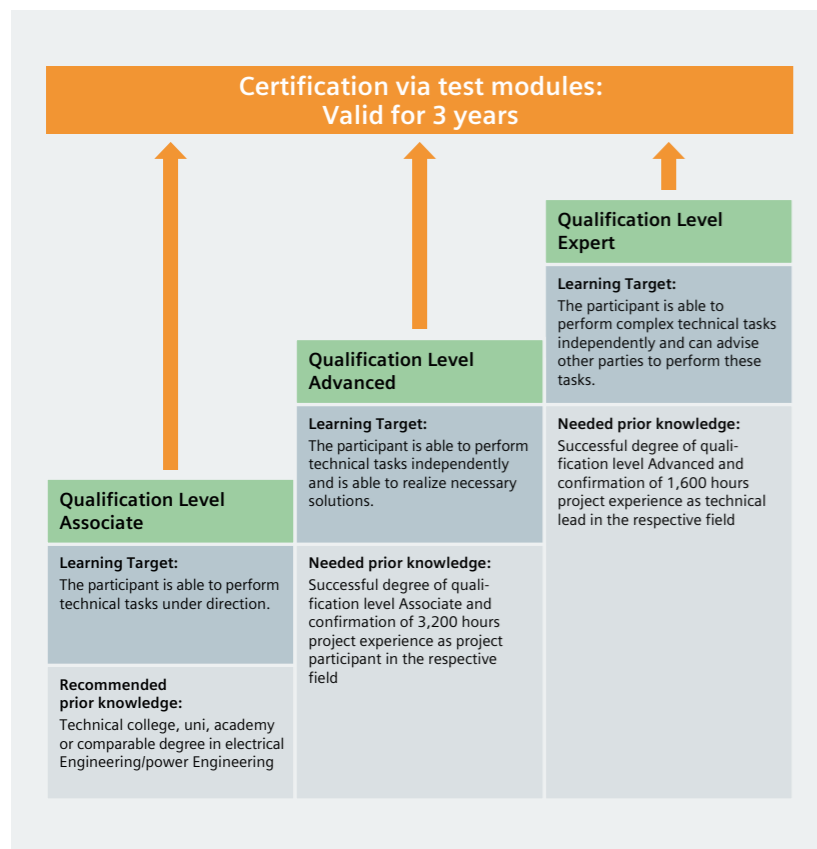
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Siemens Power Academy TD – Certification



Knowledge curve with the Siemens Power Academy Competence Program



Qualification levels of the Competence Program

The Power Academy's Competence Program is your opportunity for long-term knowledge acquisition and know-how buildup. Compared to conventional single courses, our program offers you additional value while continuing certificates prevent precious knowledge from getting lost.

The Power Academy TD's Competence Program offers you the opportunity to gain certificates for the three educational levels Associate, Advanced and Expert. Different to single training courses, the seven Competence Program's training courses each consist of one curriculum meaning a combination from several different single training courses on specific topics. A final exam at the end of each qualification level tests the acquainted knowledge. The curriculum's advantage consists in the certificate each participant gains in comparison to the confirmation of participation in the course that is usually being assigned. This certificate is valid for three years and can be prolonged by passing a new exam.

The targets of each educational level at a glance

Associate

The participant gains basic knowledge on the subject selected for the curriculum. He can use this basic knowledge for the further progress of his professional career. The Associate is able to solve specific tasks under supervision.

Advanced

Qualification level Advanced build on the acquainted knowledge and the professional expertise of Associates and expand them. Based on the knowledge gained on the advanced educational level, participants are able to solve specific tasks in their daily work on their own and implement the necessary measures.

Expert

To be assigned to the qualification level Expert, the participant has already applied his knowledge on the advanced level in his daily work. With his comprehensive

professional experience and with the additional knowledge acquainted on the expert level, the participant is able to solve complex tasks of his everyday's work on his own. Furthermore, he or she is able to convey complex tasks and approaches to solve them to third parties.

Qualification certification.

A theoretical test must be taken as entry test for each course. The two upper qualification levels Advanced and Expert also require proof of practical experience (see diagram "Qualification levels"). Documentation of an FAT (factory acceptance test), SAT (site acceptance test) or similar

acceptance tests signed by the end customer, specifying in writing that the person applying for certification participated in the project in the appropriate position will be accepted as proof of such practical experience.

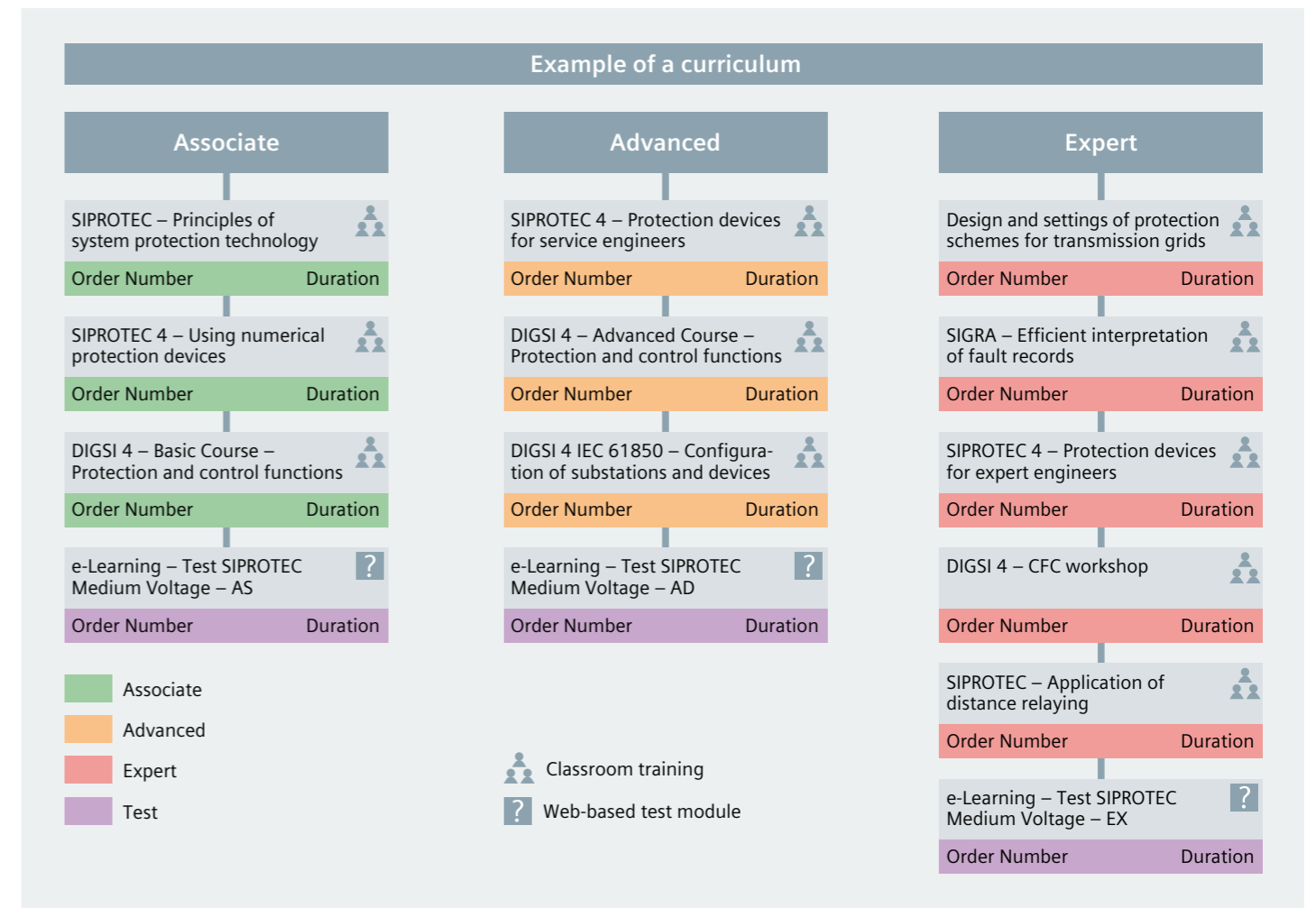
Theoretical final test

To take the web-based theoretical final test, you must first register and can then take the test at any time in the Siemens Power Academy TD or in one of our Siemens offices worldwide. To pass this final test (multiple choice), 75% or more of your answers must be correct. You will need about three hours for the test. The

test for each course within a qualification level costs 90 euros. If you fail the test, you can repeat it up to three times.

Recertification

Certification is valid for three years. You can obtain recertification by passing the appropriate theoretical test(s) within a period of two years after their expiry.



Example of a curriculum

Curriculum SIPROTEC Protection Technology on Transmission Systems



Qualification level: Associate

Aim of the training:

The participants in the SIPROTEC High-Voltage Associate program learn the basic modules required for the Associate qualification level and are able to use these in a targeted fashion in further expanding their occupational experience in order to be able to work through tasks from the topic area step by step under supervision.

They learn the basics about the uses, working principles and the overall concept of the most important protective devices. They are familiarized with the concept and the working principles of digital network protection systems of SIPROTEC 4 devices. They learn how to use the DIGSI 4 operating program.

The training is intended for:

employees from the power utilities and industrial sector who have recently started working in the planning, engineering, commissioning, maintenance and operation of digital network protection equipment of SIPROTEC 4 devices.

Recommended prior knowledge:

Basic knowledge of electrical engineering and protection engineering.

Content focuses:

- Principles of digital network protection systems
- SIPROTEC 4 – Application and proper use of digital network protection equipment
- DIGSI 4 – Elementary course: Protection and I&C functions

Qualification level: Advanced

Aim of the training:

The participants in the SIPROTEC High-Voltage Advanced program have already successfully put into practice what they have learned from the Associate program and have further expanded their occupational experience in the topic area. Thanks to the Advanced qualification level, they are able to perform the duties of the topic area unassisted and to derive appropriate solutions and implement them in their projects.

They will acquire a more profound understanding of how digital network protection devices work. They can put what they have learned into practice on the basis of typical project applications. They are familiarized with the concept and designing of equipment communication via the IEC 61850 protocol. They learn how impedance protection and/or differential protection work.

The training is intended for:

employees from the power utilities and industrial sector who have to deal with the planning, engineering, commissioning, maintenance and operation of digital network protection equipment of SIPROTEC 4 devices.

Required prior knowledge:

Graduation at the SIPROTEC Protection Technology on Transmission Systems Associate qualification level and proof of 3,200 hours project experience, at least as project member.

Content focuses:

- SIPROTEC 4 – Protection technology for service engineers
- DIGSI 4 – Advanced course: Protection and I&C functions
- DIGSI 4 IEC 61850 – Configuration of stations and devices
- Practical applications of distance protection
- Practical applications of differential protection

Qualification level: Expert

Aim of the training:

The participants in the SIPROTEC High-Voltage Expert program have already successfully applied in their projects what they have learned from the Advanced program. Thanks to their extensive occupational experience in the topic area and to the Expert qualification level, they are able to explain complex issues in the topic area to others so that these can work out appropriate solutions.

They have detailed knowledge about the protection of power distribution networks and are able to design complex protection systems. They are familiar with the special protection requirements for high-voltage and ultra-high-voltage networks. They are able to use SIGRA 4 effectively and efficiently, to analyze fault plots in Comtrade format and to retrace the responses of the protective equipment. They will study complex fault events on the digital real-time simulator, taking into account the interaction of various network and protection systems. They understand how impedance protection works and are able to apply this in practice. They learn tips & tricks about graphic engineering of automation tasks.

The training is intended for:

employees from the power utilities and industrial sector who have to deal with the planning, engineering, commissioning, maintenance and operation of digital network protection equipment of SIPROTEC 4 devices.

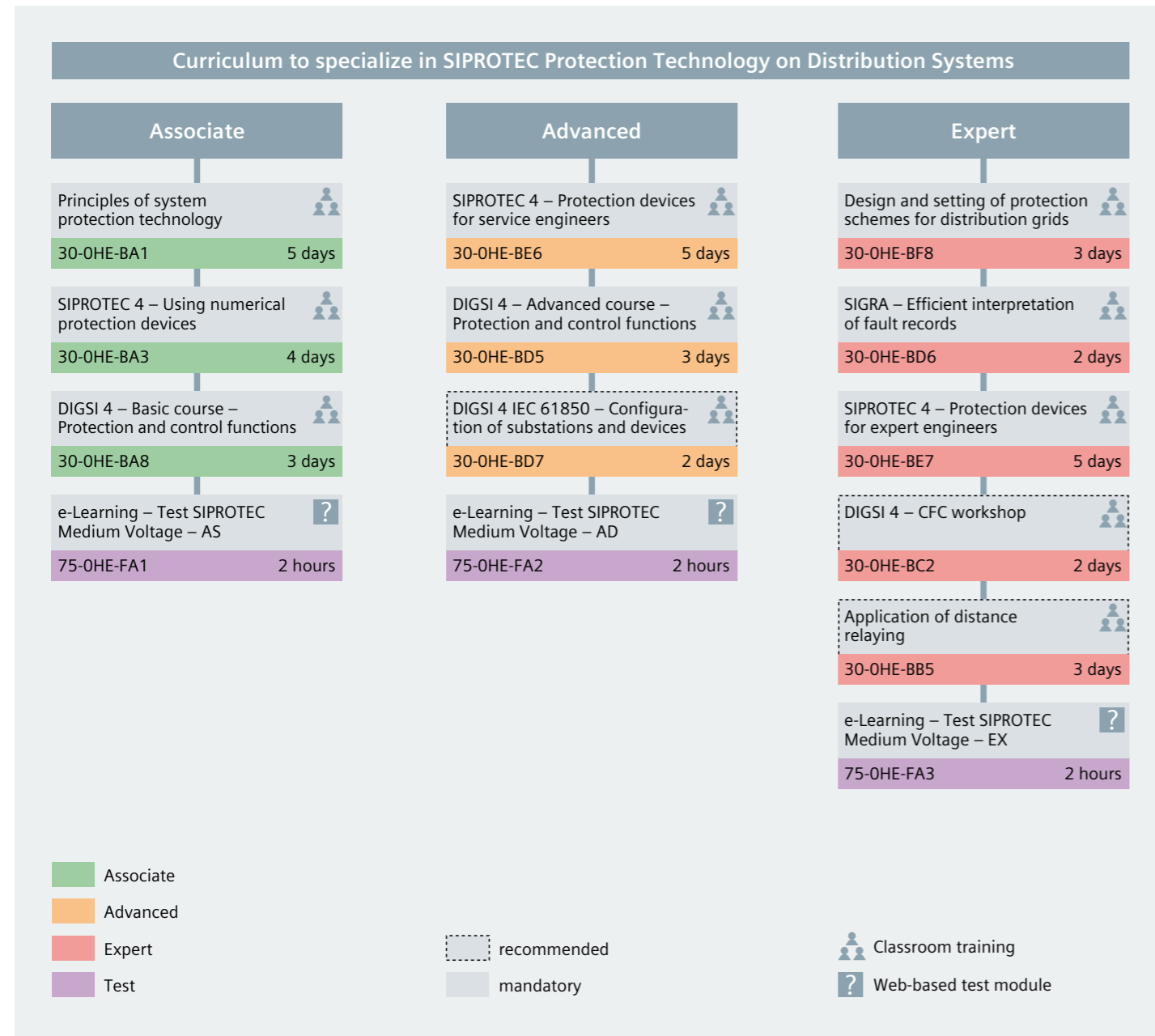
Required prior knowledge:

Graduation at the SIPROTEC Protection Technology on Transmission Systems Advanced qualification level and proof of 1,600 hours project experience as technical lead.

Content focuses:

- SIPROTEC 4 – Protection technology for experts
- SIGRA – Efficient interpretation of fault plots
- Experts workshop on modern network protection technology
- Practical applications of distance protection
- DIGSI 4 – CFC Workshop

Curriculum SIPROTEC Protection Technology on Distribution Systems



Qualification level: Associate

Aim of the training:

The participants in the SIPROTEC Medium Voltage Associate program learn the basic modules required for the Associate qualification level and are able to use these in a targeted fashion in further expanding their occupational experience in order to be able to work through tasks from the topic area step by step under supervision.

They learn the basics about the uses, working principles and the overall concept of the most important protective devices.

They are familiarized with the concept and the working principles of digital network protection systems of SIPROTEC 4 devices.

They learn how to use the DIGSI 4 operating program.

The training is intended for:

employees from the power utilities and industrial sector who have recently started working in the planning, engineering, commissioning, maintenance and operation of digital network protection equipment of SIPROTEC 4 devices.

Recommended prior knowledge:

Basic knowledge of electrical engineering and protection engineering.

Content focuses:

- Principles of digital network protection systems
- SIPROTEC 4 – Application and proper use of digital network protection equipment
- DIGSI 4 – Elementary course: Protection and I&C functions

Qualification level: Advanced

Aim of the training:

The participants in the SIPROTEC Medium Voltage Advanced program have already successfully put into practice what they have learned from the Associate program and have further expanded their occupational experience in the topic area. Thanks to the Advanced qualification level, they are able to perform the duties of the topic area unassisted and to derive appropriate solutions and implement them in their projects.

They will acquire a more profound understanding of how digital network protection devices work. They can put into practice what they have learned on the basis of typical project applications. They are familiarized with the concept and engineering of equipment communication via the IEC 61850 protocol.

The training is intended for:

employees from the power utilities and industrial sector who have to deal with the planning, engineering, commissioning, maintenance and operation of digital network protection equipment of SIPROTEC 4 devices.

Required prior knowledge:

Graduation at the SIPROTEC Protection Technology on Distribution Systems Associate qualification level and proof of 3,200 hours project experience, at least as project member.

Content focuses:

- SIPROTEC 4 – Protection technology for service engineers
- DIGSI 4 – Advanced course: Protection and I&C functions
- DIGSI 4 IEC 61850 – Configuration of stations and devices

Qualification level: Expert

Aim of the training:

The participants in the SIPROTEC Medium Voltage Expert program have already successfully applied what they have learned from the Advanced program in their projects. Thanks to their extensive occupational experience in the topic area and to the Expert qualification level, they are able to explain complex issues in the topic area to others so that these can work out appropriate solutions.

They have detailed knowledge about the protection of power distribution networks and are familiar with the special protection requirements for medium-voltage distribution networks. They are able to use SIGRA 4 effectively and efficiently, to analyze fault plots in Comtrade format and to trace the responses of the protective equipment. They are able to analyze fault plots, including response versus time, current and voltage histories, determination of the impedance and identification of fault locations. They have the knowledge necessary for designing complex protection systems. They learn tips & tricks about graphic representation of automation tasks for design purposes.

The training is intended for:

employees from the power utilities and industrial sector who have to deal with the planning, engineering, commissioning, maintenance and operation of digital network protection equipment of SIPROTEC 4 devices.

Required prior knowledge:

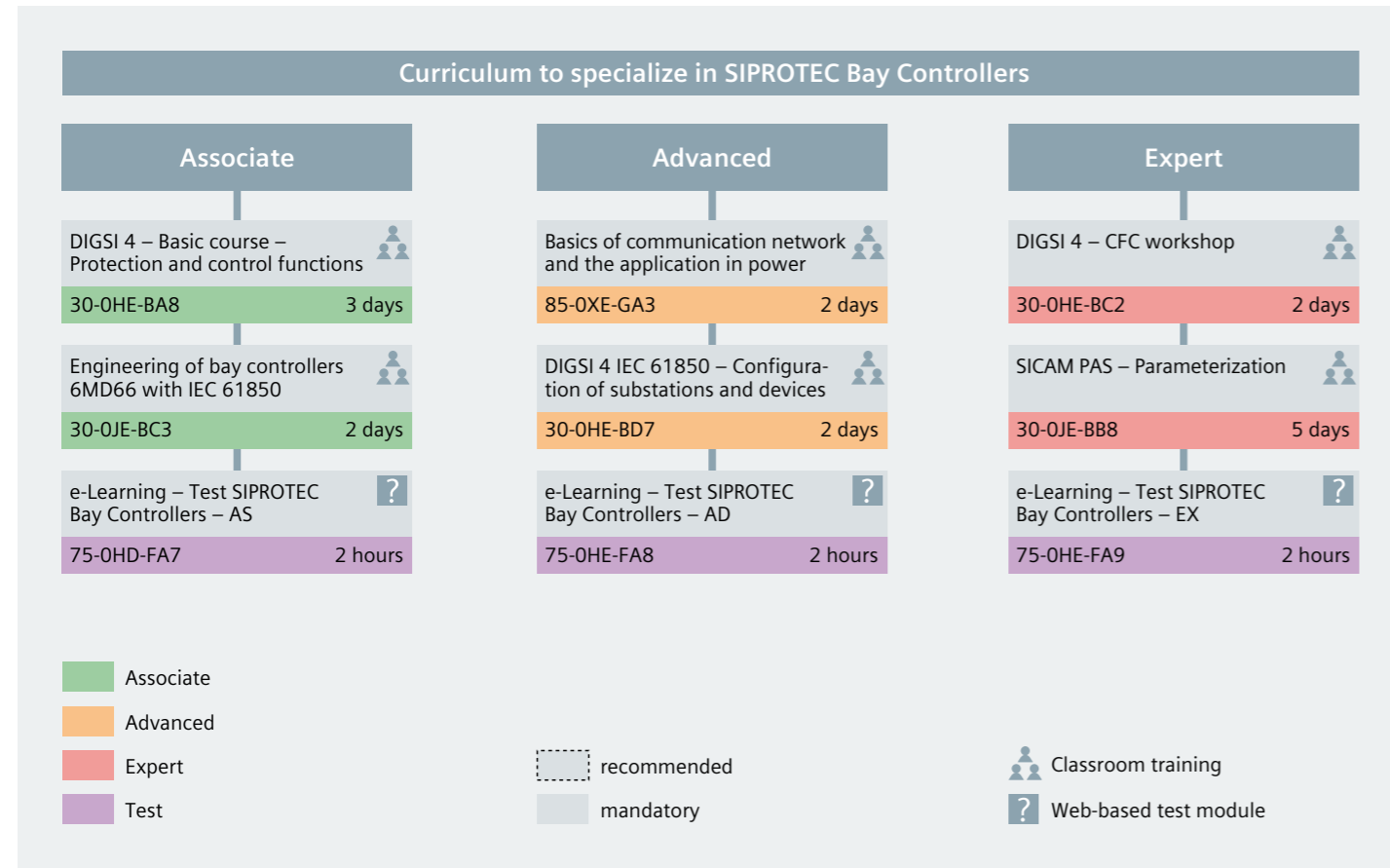
Graduation at the SIPROTEC Protection Technology on Distribution Systems Advanced qualification level and proof of 1,600 hours project experience as technical lead.

Content focuses:

Design and settings for protection systems for distribution grids:

- SIGRA – Efficient interpretation of fault records
- SIPROTEC 4 – Protection technology for experts
- DIGSI 4 – CFC Workshop
- Practical applications of distance protection

Curriculum SIPROTEC Bay Controller



Qualification level: Associate

Aim of the training:

The participants in the SIPROTEC Bay Controllers Associate program learn the basic modules required for the Associate qualification level and are able to use these in a targeted fashion in further expanding their occupational experience in order to be able to work through tasks from the topic area step by step under supervision.

They learn to adjust, manage, operate and troubleshoot SIPROTEC 4 devices with the aid of the DIGSI 4 operating program. They use DIGSI 4 to engineer and implement their own functions and control tasks. They learn to adjust, manage and operate 6MD66 field control equipment. They use DIGSI 4 to engineer and implement their own functions and control tasks.

The training is intended for:

employees from the power utilities and industrial sector who have recently started working in the planning, engineering, commissioning, maintenance and operation of digital network protection equipment of SIPROTEC 4 devices.

Recommended prior knowledge:

Basic knowledge of electrical engineering and protection engineering.

Content focuses:

- DIGSI 4 – Elementary course: Protection and control functions
- Engineering of 6MD66 bay control devices with IEC 61850

Qualification level: Advanced

Aim of the training:

The participants in the SIPROTEC Bay Controllers Advanced program have already successfully put into practice what they have learned from the Associate program and have further expanded their occupational experience in the topic area. Thanks to the Advanced qualification level, they are able to perform the duties of the topic area unassisted and to derive appropriate solutions and implement them in their projects.

They acquire basic knowledge of communications networks (LAN/WAN) of the kinds used in the context of power transmission and distribution. They are familiarized with the concept and designing of equipment communication via the IEC 61850 protocol. They are introduced to the fundamentals of the Ethernet communication profile and the application of various communication topologies.

The training is intended for:

employees from the power utilities and industrial sector who have to deal with the planning, engineering, commissioning, maintenance and operation of digital network protection equipment of SIPROTEC 4 devices.

Required prior knowledge:

Graduation at the SIPROTEC Bay Controllers Associate qualification level and proof of 3,200 hours project experience, at least as project member.

Content focuses:

- Fundamentals of communications networks and their application
- DIGSI 4 IEC 61850 – Configuration of stations and devices

Qualification level: Expert

Aim of the training:

The participants in the SIPROTEC Bay Controllers Expert program have already successfully applied in their projects what they have learned from the Advanced program. Thanks to their extensive occupational experience in the topic area and to the Expert qualification level, they are able to explain complex issues in the topic area to others so that these can work out appropriate solutions.

They elaborate requirements for protective and I&C automation and discuss them with the users. They learn tips & tricks about graphic representation of automation tasks for engineering purposes and are familiarized in detail with the CFC configuring blocks. They learn to parameterize a SICAM PAS system unassisted.

The training is intended for:

employees from the power utilities and industrial sector who have to deal with the planning, engineering, commissioning, maintenance and operation of digital network protection equipment of SIPROTEC 4 devices.

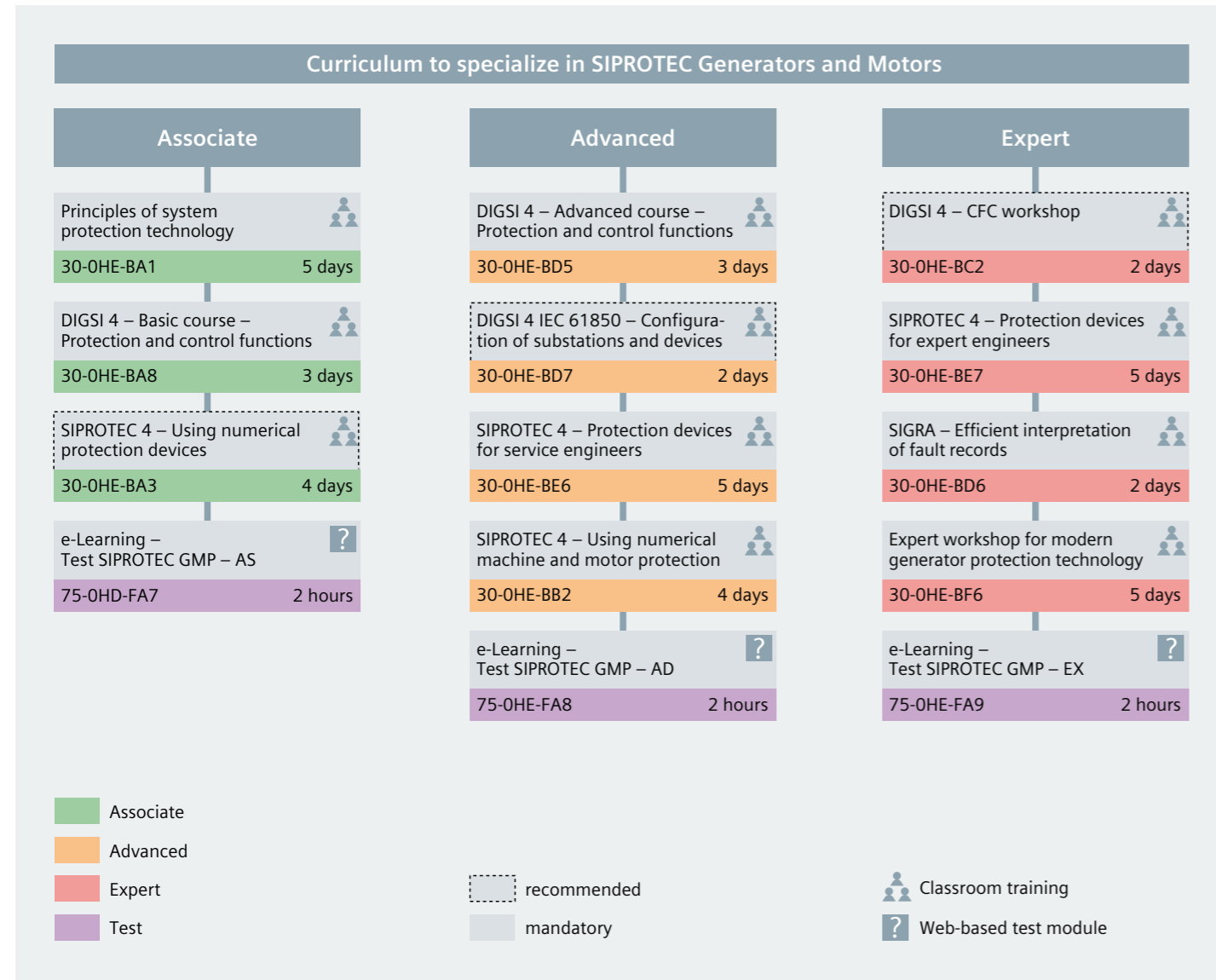
Required prior knowledge:

Graduation at the SIPROTEC Bay Controllers Advanced qualification level and proof of 1,600 hours project experience as technical lead.

Content focuses:

- DIGSI 4 CFC Workshop
- SICAM PAS – Parameterization

Curriculum SIPROTEC Generators and Motors



Qualification level: Associate

Aim of the training:

The participants in the SIPROTEC Generators and Motor Protection Associate program learn the basic modules required for the Associate qualification level and are able to use these in a targeted fashion in further expanding their occupational experience in order to be able to work through tasks from the topic area step by step under supervision.

They learn the basics about the uses, working principles and the overall concept of the most important protective devices.

They learn how to use the DIGSI 4 operating program.

They are familiarized with the concept and the working principles of digital network protection systems of SIPROTEC 4 devices.

The training is intended for:

employees from the power utilities and industrial sector who have recently started working in the planning, engineering, commissioning, maintenance and operation of digital network protection equipment of SIPROTEC 4 devices, especially machine protection.

Recommended prior knowledge:

Basic knowledge of electrical engineering and protection engineering.

Content focuses:

Principles of digital network protection systems:

- DIGSI 4 – Elementary course: Protection and control functions
- SIPROTEC 4 – Application and proper use of digital network protection equipment

Qualification level: Advanced

Aim of the training:

The participants in the SIPROTEC Generators and Motor Protection Advanced program have already successfully put what they have learned from the Associate program into practice and have further expanded their occupational experience in the topic area. Thanks to the Advanced qualification level, they are able to perform the duties of the topic area unassisted and to derive appropriate solutions and implement them in their projects.

They will acquire a more profound understanding of how digital network protection devices work. They can put what they have learned into practice on the basis of typical project applications. They are familiarized with the concept and designing of equipment communication via the IEC 61850 protocol. They are familiarized with the working principles, uses and designing of numerical unit and station-service protection systems.

The training is intended for:

employees from the power utilities and industrial sector who have to deal with the planning, engineering, commissioning, maintenance and operation of digital network protection equipment of SIPROTEC 4 devices.

Required prior knowledge:

Graduation at the SIPROTEC Generators and Motor Protection Associate qualification level and proof of 3,200 hours project experience, at least as project member.

Content focuses:

- DIGSI 4 – Advanced course: Protection and I&C functions
- DIGSI 4 IEC 61850 – Configuration of stations and devices
- SIPROTEC 4 – Protection technology for service engineers
- Application and practical use of digital machinery protection equipment

Qualification level: Expert

Aim of the training:

The participants in the SIPROTEC Generators and Motor Protection Expert program have already successfully applied what they have learned from the Advanced program in their projects. Thanks to their extensive occupational experience in the topic area and to the Expert qualification level, they are able to explain complex issues in the topic area to others so that these can work out appropriate solutions.

They learn tips & tricks about graphic engineering of automation tasks. They have detailed knowledge about the protection of power distribution networks and are able to design complex protection systems. They are familiar with the special protection requirements for high-voltage and ultra-high-voltage networks. They are able to use SIGRA 4 effectively and efficiently, to analyze fault plots in Comtrade format and to trace the responses of the protective equipment. They will study complex fault events on the digital real-time Simulator, taking into account the interaction of various network, generator and generator protection systems.

The training is intended for:

employees from the power utilities and industrial sector who have to deal with the planning, engineering, commissioning, maintenance and operation of digital network protection equipment of SIPROTEC 4 devices.

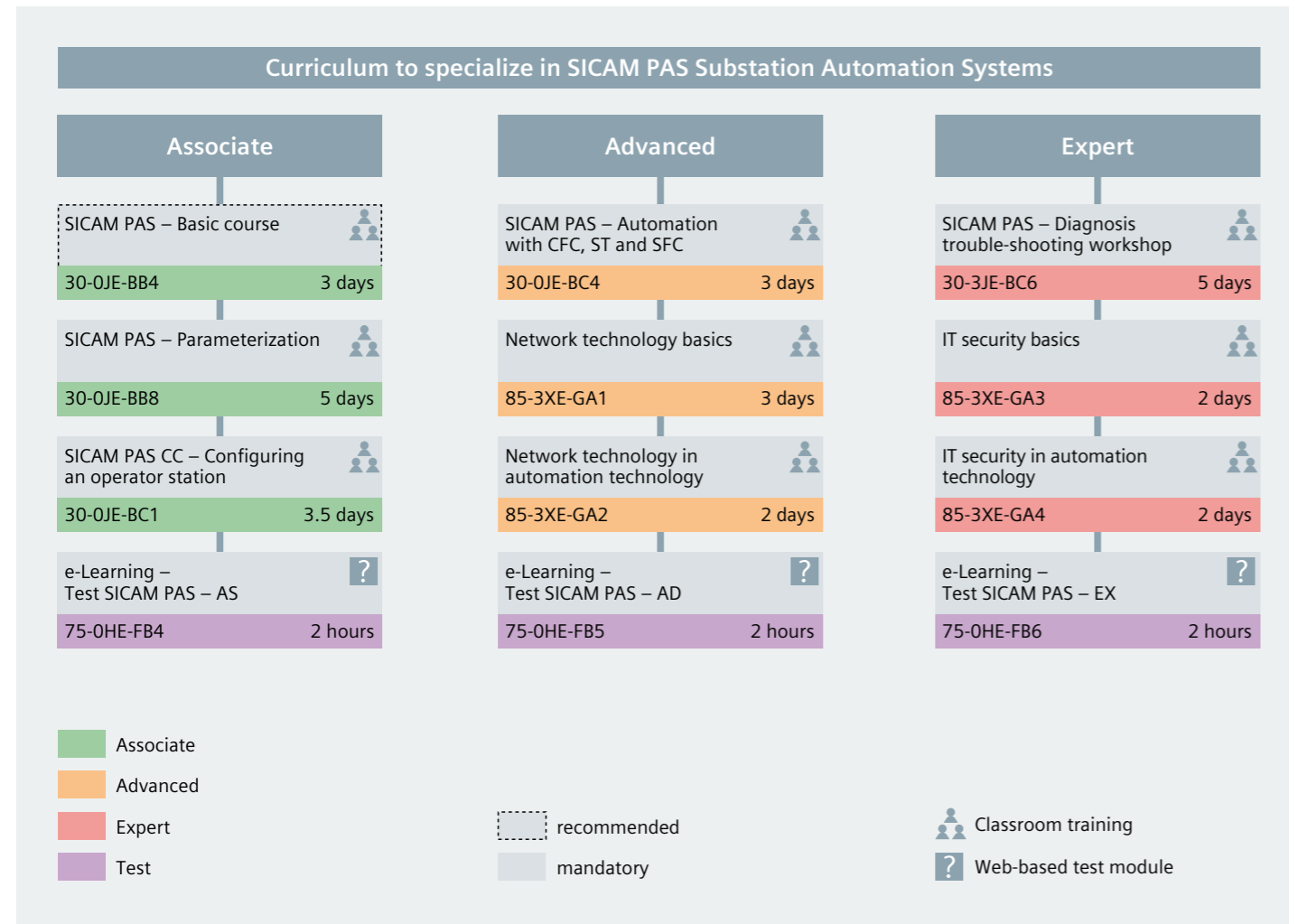
Required prior knowledge:

Graduation at the SIPROTEC Generator and Motor Protection Advanced qualification level and proof of 1,600 hours project experience as technical lead.

Content focuses:

- DIGSI 4 CFC Workshop
- SIPROTEC 4 – Protection technology for experts
- SIGRA – Efficient interpretation of fault plots
- Experts workshop on modern generator protection technology

Curriculum SICAM PAS Substation Automation Systems



Qualification level: Associate

Aim of the training:

The participants in the SICAM PAS Associate program learn the basic modules required for the Associate qualification level and are able to use these in a targeted fashion in further expanding their occupational experience in order to be able to work through tasks from the topic area step by step under supervision.

They are given a basic knowledge of the SICAM PAS system and learn to apply that knowledge. They learn the SICAM PAS operating sequences and will be able to use these in operations management. They will be able to parameterize a SICAM PAS system unassisted. They will be able to configure an operator station for a SICAM PAS system.

The training is intended for:

employees from the power utilities and industrial sector whose duties involve the planning, engineering, commissioning, maintenance and operation of SICAM PAS systems.

Recommended prior knowledge:

Basic knowledge of electrical engineering and automation engineering.

Content focuses:

- SICAM PAS – Elementary course
- SICAM PAS – Parameterization
- SICAM PAS – Configuration of an operator station

Qualification level: Advanced

Aim of the training:

The participants in the SICAM PAS Advanced program have already successfully put what they have learned from the Associate program into practice and have further expanded their occupational experience in the topic area. Thanks to the Advanced qualification level, they are able to perform the duties of the topic area unassisted and to derive appropriate solutions and implement them in their projects.

They are familiarized with the most important CFC modules and their use and the advantages of the programming language ST (Structured Text), specially developed for automation solutions. They will parameterize and program examples in various applications. The participants are familiarized with the latest types of LAN networks and media, learn about protocol architectures (TCP/IP), and will acquire a fundamental understanding of network design. They will elaborate special demands and features required of a network in an automation system.

The training is intended for:

employees from the power utilities and industrial sector whose duties involve the planning, design, commissioning, maintenance and operation of SICAM PAS systems.

Required prior knowledge:

Graduation at the SICAM PAS Associate qualification level and proof of 3,200 hours project experience, at least as project member.

Content focuses:

- SICAM PAS – Automation with CFC and ST
- Fundamentals of network engineering
- Network engineering in automation engineering

Qualification level: Expert

Aim of the training:

The participants in the SICAM PAS Expert program have already successfully applied what they have learned from the Advanced program in their projects. Thanks to their extensive occupational experience in the topic area and to the Expert qualification level, they are able to explain complex issues in the topic area to others so that these can work out appropriate solutions.

They will have extensive knowledge of field and station instrumentation and control (PAS), visualization and operating & monitoring (WinCC), network and communication engineering (RuggedCom). They will perform systematic diagnoses and troubleshooting throughout the entire plant. They learn and understand how to implement organizational and technical measures for safeguarding automation engineering networks. They will check out a typical automation network comprising automation components, a control system, office PCs, etc., for security features and add to these as necessary.

The training is intended for:

employees from the power utilities and industrial sector whose duties involve the planning, engineering, commissioning, maintenance and operation of SICAM PAS systems.

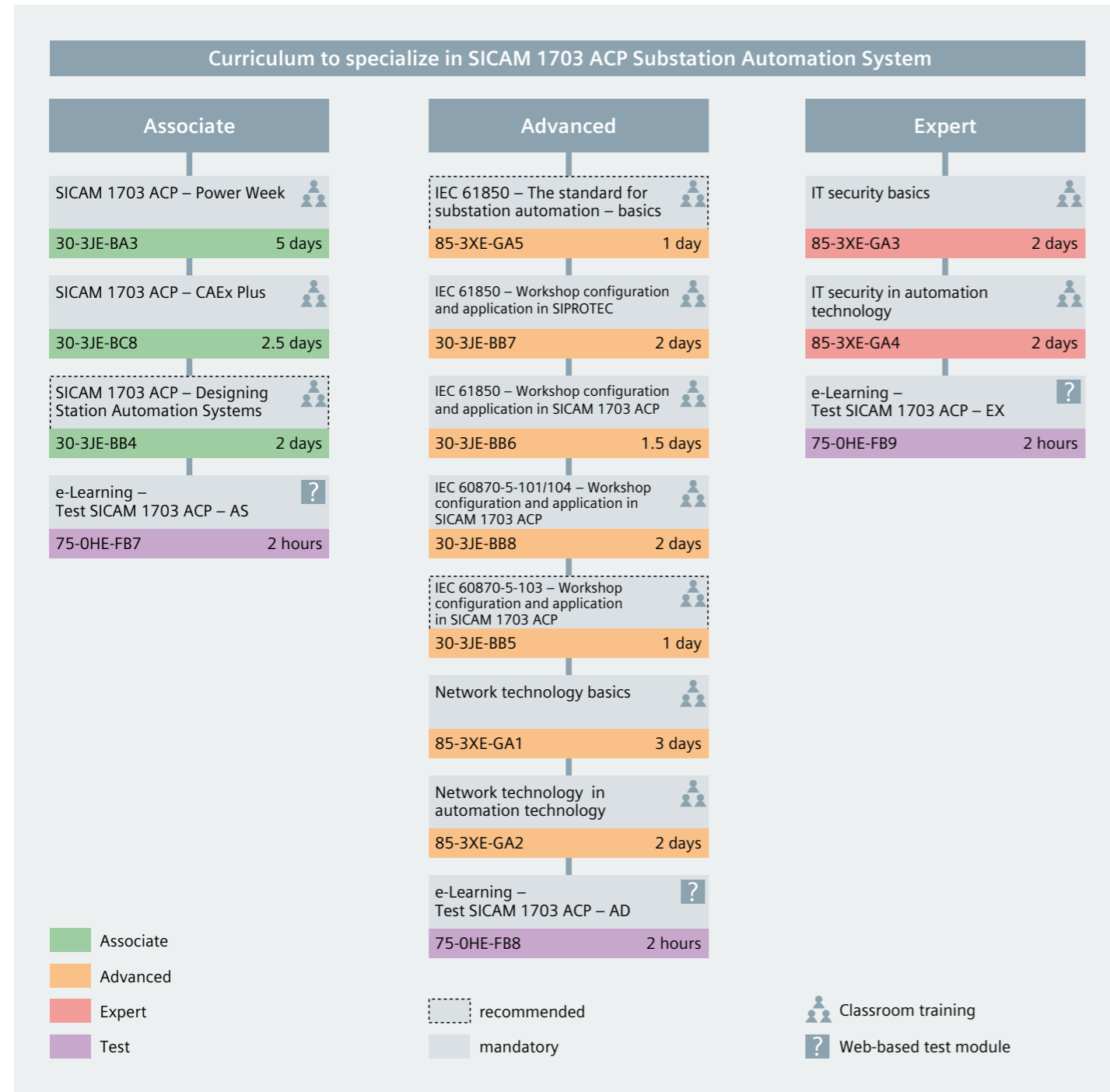
Required prior knowledge:

Graduation at the SICAM PAS Advanced qualification level and proof of 1,600 hours project experience as technical lead.

Content focuses:

- SICAM PAS Diagnosis & troubleshooting workshop
- Fundamentals of IT security
- IT security in automation engineering

Curriculum SICAM 1703 ACP Substation Automation Systems



Qualification level: Associate

Aim of the training:

The participants in the SICAM 1703 ACP Associate program learn the basic modules required for the Associate qualification level and are able to use these in a targeted fashion in further expanding their occupational experience in order to be able to work through tasks from the topic area step by step under supervision.

They are given a basic knowledge of the scalable automation system SICAM 1703 ACP and of the OPM II parameterizing tool. They are able to make simple changes to the parameterization and plant diagnoses unassisted.

The training is intended for:

employees from the power utilities and industrial sector whose duties involve the planning, engineering, commissioning, maintenance and operation of SICAM 1703 ACP systems.

Recommended prior knowledge:

Basic knowledge of electrical engineering and familiarity with the most important concepts of remote control engineering – e.g. from the „Introduction to automation engineering“ training course.

Content focuses:

- SICAM 1703 ACP Power Week
- CAEx Plus for SICAM 1703 ACP
- Design of SICAM 1703 ACP systems in station automation

Remark:

The training course SICAM 1703 ACP Power Week substituted by the following group of courses:

- SICAM 1703 ACP
 - Basic course
 - Service
 - OPM II basic course
 - CAEx Plus
 - Configuration
- TM 1703 mic configuration

Qualification level: Advanced

Aim of the training:

The participants in the SICAM 1703 ACP Advanced program have already successfully put what they have learned from the Associate program into practice of at least 3,200 practical hours and have further expanded their occupational experience in the topic area. Thanks to the Advanced qualification level, they are able to perform the duties of the topic area unassisted and to derive appropriate solutions and implement them in their projects.

They learn to use the IEC 61850 standard. They acquire the knowledge necessary to be able to engineer an IEC 61850 interface for SIPROTEC and SICAM 1703 ACP applications. They deal with functions such as time-setting, overall scanning and issuing commands. The most common analysis tools for this protocol will be explained to the participants. They will be given the knowledge required to engineer an IEC 60870-5-103 interface in the SICAM 1703 ACP system. In the seminar, both master and slaves will be engineered and then tested on a training set-up.

The training is intended for:

employees from the power utilities and industrial sector whose duties involve the planning, engineering, commissioning, maintenance and operation of SICAM 1703 ACP systems.

Required prior knowledge:

- Graduation at the SICAM 1703 ACP Associate qualification level
- proof of 3,200 hours project experience, at least as project member within 1703 ACP-projects

Content focuses:

- IEC 61850: The new standard in station instrumentation and control – elementary course
- IEC 61850 – Workshop on engineering and application in SIPROTEC
- IEC 61850 – Workshop on engineering and application in SICAM 1703 ACP
- IEC 60870-5-101/104 – Workshop on engineering and application in SICAM 1703 ACP
- IEC 60870-5-103 – Workshop on engineering and application in SICAM 1703 ACP

Qualification level: Expert

Aim of the training:

The participants in the SICAM 1703 ACP Expert program have already successfully applied what they have learned from the Advanced program in their projects. Thanks to their extensive occupational experience in the topic area and to the Expert qualification level, they are able to explain complex issues in the topic area to others so that these can work out appropriate solutions.

They can define organizational and technical measures for safeguarding networks for automation systems. They can elaborate security solutions specially tailored to automation engineering networks. They will check out a typical automation network comprising automation components, a control system, office PCs, etc., for security features and add to these as necessary.

The training is intended for:

employees from the power utilities and industrial sector whose duties involve the planning, engineering, commissioning, maintenance and operation of SICAM 1703 ACP systems.

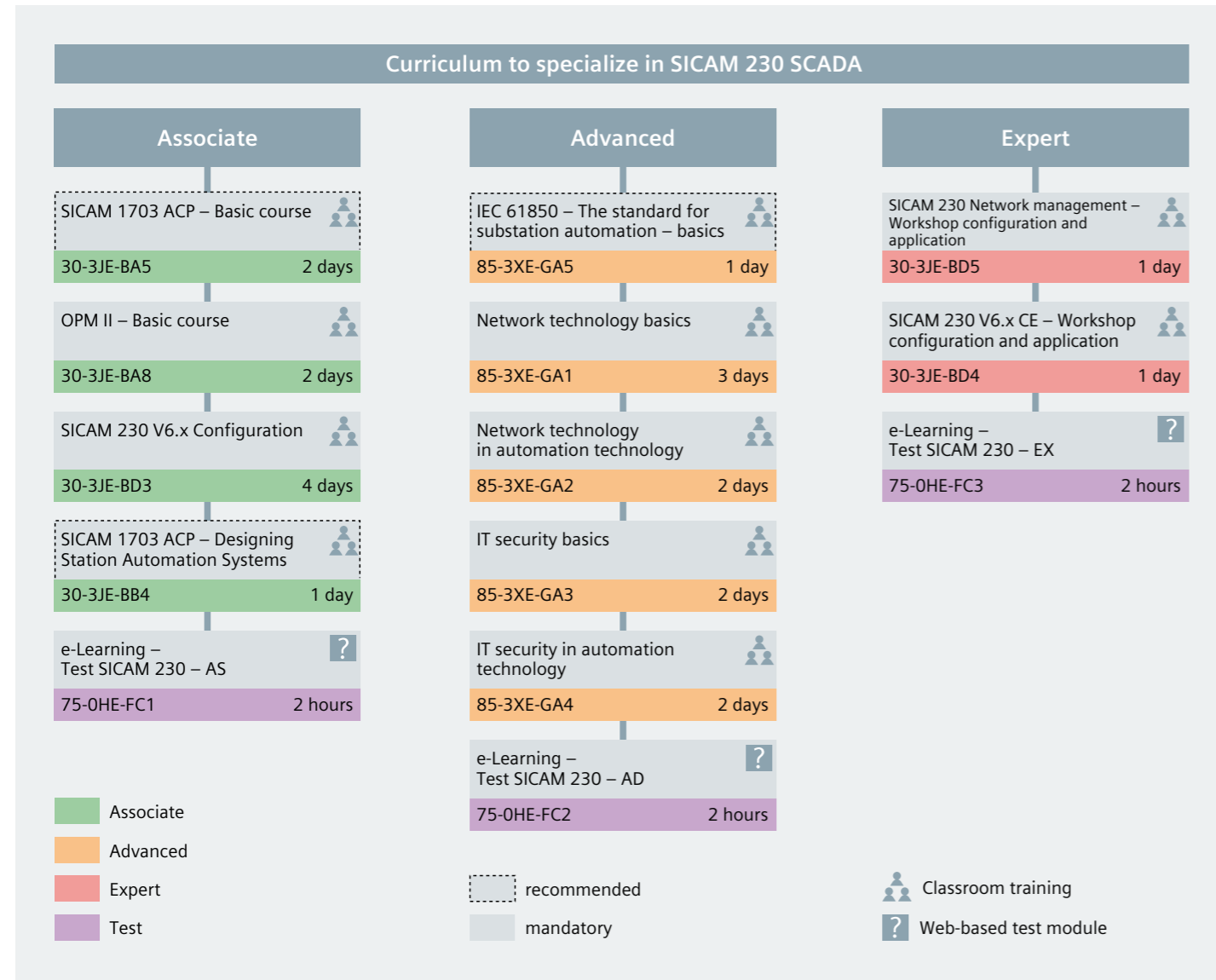
Required prior knowledge:

- Graduation at the SICAM 1703 ACP Advanced qualification level
- proof of 1,600 hours project experience as technical lead

Content focuses:

- Fundamentals of IT security
- IT security in automation engineering

Curriculum SICAM 230 SCADA



Qualification level: Associate

Aim of the training:

The participants in the SICAM 230 Associate program learn the basic modules required for the Associate qualification level and are able to use these in a targeted fashion in further expanding their occupational experience in order to be able to work through tasks from the topic area step by step under supervision. They learn the most important functions of SICAM 230 in order to be able to tackle new projects.

The training is intended for:

employees from the power utilities and industrial sector whose duties involve the planning, engineering, commissioning, maintenance and operation of SICAM 230 projects.

Recommended prior knowledge:

Basic knowledge of electrical engineering and basic familiarity with the SICAM 1703 system.

Content focuses:

- SICAM 230 V6.x engineering and application
- OPM II basic course
- SICAM 1703 ACP basic course
- Engineering of SICAM 1703 ACP systems in station automation

Qualification level: Advanced

Aim of the training:

The participants in the SICAM 230 Advanced programs have already successfully put what they have learned from the Associate program into practice and have further expanded their occupational experience in the topic area. Thanks to the Advanced qualification level, they are able to perform the duties of the topic area unassisted and to derive appropriate solutions and implement them in their projects.

They are given an introduction to the new communications standard IEC 61850. Networks form the basis of all modern automation systems. This makes it all the more important for the process engineer to have a sound basic knowledge in this area, too. The participants are familiarized with the latest types of LAN networks and media, learn about protocol architectures (TCP/IP), understand concepts such as Ethernet, switching, IP routing and IP addressing. They also acquire a fundamental understanding of network design issues. This knowledge enables them to design simple networks of their own accord and constitutes a sound basis for understanding complex networks. The participants build a typical network, consisting of automation components, a control system and an Industrial Layer 2/3 Ethernet network and elaborate appropriate security solutions.

The training is intended for:

employees from the power utilities and industrial sector whose duties involve the planning, engineering, commissioning, maintenance and operation of SICAM 230 solutions.

Required prior knowledge:

- Graduation at the SICAM 230 Associate qualification level
- proof of 3,200 hours project experience, at least as project member

Content focuses:

- IEC 61850: The new standard in station instrumentation and control – elementary course
- Fundamentals of network engineering
- Network engineering in automation engineering
- Fundamentals of IT security
- IT security in automation engineering

Qualification level: Expert

Aim of the training:

The participants in the SICAM 230 Expert program have already successfully applied what they have learned from the Advanced program in their projects. Thanks to their extensive occupational experience in the topic area and to the Expert qualification level, they are able to explain complex issues in the topic area to others so that these can work out appropriate solutions.

They learn the practical use of the SICAM network manager NWM230 as a solution integrated into automation and control systems for monitoring active network components especially for technical communications processes in the LAN and WAN context. They are able to adapt the preconfigured SAT 230 touch panel to specific processes.

In line with the defined aims, they are able to integrate:

- new plant displays
- additional process data representations

They are able to assess the feasibility of new requirements and to implement them within the defined system boundaries.

The training is intended for:

employees from the power utilities and industrial sector whose duties involve the planning, engineering, commissioning, maintenance and operation of SICAM 230 solutions.

Required prior knowledge:

- Graduation at the SICAM 230 Advanced qualification level
- proof of 1,600 hours project experience as technical lead

Content focuses:

- SICAM 230 Network Manager – Workshop on engineering and application
- SICAM 230 V6.x CE – Workshop on engineering and application



General Courses

Courses Related to Energy Sector

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General Power Engineering Courses

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Basics of power system technology for transmission and distribution, part II 40

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Basics of load and short circuit calculation in power transmission and distribution systems 41

Principles of power system planning 42

Substation engineering and design 42

System planning and quality of power transmission networks 43

System planning and quality of power distribution and industry networks 43

Introduction to distribution systems and power circuit analysis 44

Distribution planning and reliability assessment 44

Power system reliability 45

Distribution system losses 46

Electric system losses 46

Industrial power system applications 47

Low-voltage secondary networks 47

Distributed generation and energy storage applications on power systems 48

Earthing and interference in high- and low-voltage installations 48

Overvoltages and insulation coordination 49

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Power system dynamics 50

Fundamentals of protective relaying 50

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Fundamentals of power flow analysis with applications 57

Introduction to power system dynamics 58

Power system small-signal stability and stabilizer tuning 58

Basics of power quality 59

Energy Sector – T&D – Technology at a glance

Training objectives:

The training participants will refresh principals of electrical engineering and will get an overview about use and applications engineering of products and solutions in the field of power transmission and distribution.

General overview:

Business units of Transmission and Distribution Division
Organization of Transmission and Distribution Division
Technologies
Knowledge about products, systems, and services

The training is intended for:

All Siemens employees who are interested in receiving an overview about operation and utilization of products and solutions in the field of power transmission and distribution.

Main features:

- Transmission and Distribution Division strategy, business goals, organization
- Scope of products and services
- Important technical characteristics to ensure safe operation (i.e. protection relaying, selectivity)
- Presentation of business units
 - Medium Voltage
 - High Voltage
 - Transformers
 - Energy Automation
 - Energy Management & Information Systems
 - Services
- Scope of Transmission and Distribution Division Training

Note:

This training course is intended exclusively for Energy Sector employees.



Germany

Duration: 3 days

Code No.: 9CA4070-0WE00-0EA2

Language: English

Location: Nuremberg

Price: 995 EUR

Dates:

04.02. - 06.02.2009

Contact:

Carmen Davis

Phone: +49 911 433-8008

Fax: +49 911 433-7929

E-mail:

carmen.davis.ext@siemens.com

General Power Engineering Courses

Basics of power system technology for transmission and distribution, part I

Training objectives:

The participants will obtain extensive basic knowledge of power systems. They will learn to understand the engineering and application of the components of a power system, like transformer, busbar, line and cable as well as associated power system tasks as protective relaying.

The training is intended for:

Employees in power generation, transmission and industrial operations, and technically interested people who want to get a basic understanding of power system behavior.

Recommended prior knowledge:

Basic knowledge of electrical engineering.

Main features:

- Components of a typical generation, transmission and distribution system
- Power generation methods, comparison and efficiencies
- World energy demands and their growth, distribution among different primary energy sources
- Power system planning and design considerations
- Fundamental concepts in power systems: DC transients, time constants, single- and three-phase AC systems, power definitions, harmonics
- Short circuit calculations using symmetrical components

Basics of power system technology for transmission and distribution, part II

Training objectives:

The participants will deepen their knowledge of power systems engineering. They will learn to understand the engineering and application of the components of a power system, like transformer, busbar, line and cable as well as associated power system tasks as protective relaying.

The training is intended for:

Employees in power generation, transmission and industrial operations, and technically interested people who want to get a basic understanding of power system behavior.

Recommended prior knowledge:

Course "Basics of power system technology for transmission and distribution, Part 1".

Main features:

- Transmission and distribution assets: cables, overhead lines, radial, mesh and ring networks
- AIS and GIS: Comparison
- Transformer types, characteristic data of a typical power transformer, vector groups, earthing schemes, voltage regulation and tap changers
- Circuit breaker types, vacuum interrupters, recovery and restriking voltages, arc quenching mechanism
- Steady-state and transient stability, power system oscillations and power swings
- Shunt and series compensation
- High-voltage DC transmission
- Voltage and current measuring methods for protection, control and metering
- Measuring principles of different protection functions, evolution of protection relays, principle of numerical protection, protection methods for transmission and distribution networks, special problems in system applications

Introduction into analysis of the reliability of distribution power systems

Training objectives:

Training participants will get an introduction with practical-oriented knowledge on reliability calculations of high- and medium-voltage power systems of the public and industrial utilities. Based on mathematical principles for reliability calculations, the course participants receive detailed information about modeling and associated facts to do the calculations and to evaluate the results. Accompanying practical tuition at hand of feasible example power systems will deepen the knowledge.

The training is intended for:

Users from power supply utilities and industry who work with the configuration, engineering, commissioning, maintenance and operation of assets of MV- and HV-power systems.

Recommended prior knowledge:

Basics of load calculation software; ability to set up diagrams in Excel sheets.

Main features:

- Basics of reliability analysis
- Modeling of networks, failure impact and restoration
- Evaluation of results
- "Manual" calculation of a reference network
- Building up a MV example power system using the software PSS®SINCAL
- Building up a 110 kV example power system using the software PSS®SINCAL

Basics of load and short circuit calculation in power transmission and distribution systems

Training objectives:

The participants will receive information about the actual status of standard power system calculation methods, recognizing weak spots in the power system and searching for remedies.

The training is intended for:

Engineers and service technicians from power supply utilities and industry in operation, planning, design and servicing of switchgear.

Main features:

- What is the purpose of load-flow and short circuit current calculation?
- Power system structures and star point handling
- Characteristic equipment values
- Theory of calculating electrical power supply systems
- Modeling the most important electrical equipment (generator, transformer, line and load)
- Load-flow calculation, current iteration and Newton Raphson methods
- Short circuit calculation, regeneration methods, standards
- Selectivity of time-graded protection facilities (overcurrent-time and distance protection)
- Small examples calculation relating to the above-mentioned methods
- Calculating really existing power systems with the aid of interactive calculation programs on a PC or workstation to verify manually determined values
- Interpreting the results
- Possibilities of remedying weak spots in the network



Germany

Duration: 3 days
Code No.: 9CA4070-0WE00-0EA4
Language: English
Location: Nuremberg
Price: 1,375 EUR

Dates: 27.04. - 29.04.2009

Contact:
Gabriele Gundacker
Phone: +49 911 433-7416
Fax: +49 911 433-7929
E-mail: gabriele.gundacker@siemens.com



Germany

Duration: 3 days
Code No.: 9CA4070-0WE00-0EA5
Language: English
Location: Nuremberg
Price: 1,375 EUR

Dates: 18.05. - 20.05.2009

Contact:
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Germany

Duration: 2 days
Code No.: 9CA4050-0WE00-0DB3
Language: English
Location: Nuremberg
Price: 1,045 EUR

Dates: on request

Contact:
Helene Jenewein
Phone: +49 911 433-7533
Fax: +49 911 433-7929
E-mail: helene.jenewein@siemens.com



Germany

Duration: 2 days
Code No.: 9CA4025-0TE00-0JA1
Language: English
Location: Nuremberg
Price: 1,040 EUR

Dates: 27.04. - 28.04.2009

Contact:
Gabriele Gundacker
Phone: +49 911 433-7416
Fax: +49 911 433-7929
E-mail: gabriele.gundacker@siemens.com

Principles of power system planning

Training objectives:

The participants will receive general information about technical-economical solutions of power transmission and distribution in industry and other supply utilities.

The training is intended for:

Siemens employees as well as other employees from utilities and industry with their main field of work in planning and operation of power systems.

Main features:

- Power system configuration and extension planning of high-voltage, medium-voltage and low-voltage power systems, substation and component design
- Neutral grounding, project planning of earthing systems, interference of power supply installations
- Power system analysis and calculations (load flow and short circuit)
- Instrument transformer dimensioning, design and coordination of protection systems
- Operating and dynamic behavior of industrial systems with numerous use of machinery
- Switching operations, overvoltage protection and isolation coordination
- Harmonics and filter circuits, system perturbations
- Behavior of HVDC converter stations, static var compensators and controlled series compensation
- Accompanying practical instructions in questions of power system calculation, current transformer dimensioning and protection coordination

Substation engineering and design

Training objectives:

This training provides participants with an understanding of the electrical and civil engineering fundamentals for new substations and expansions of existing stations.

The training is intended for:

Engineers interested in topics that include design parameters, bus arrangements, drawings, specifications, electrical clearances, structures, foundations, grounding design, conduit design, protection, monitoring, and maintenance.

Recommended prior knowledge:

The structure of the training is intended for engineers in the first few years of substation engineering and design and for managers or seasoned designers who want to get an overview of the complete substation engineering and design process.

Main features:

- Introduction
- General design parameters
- Electrical engineering & design
- Construction, commissioning & startup
- Maintenance

System planning and quality of power transmission networks

Training objectives:

The participants will receive detailed information about problems and technically economical power transmission solutions for public power supply networks.

The training is intended for:

Employees from power generation and power supply utilities who are deployed in the field of planning and operation of electrical networks and power system protection systems.

Recommended prior knowledge:

Course "Principles of numerical protection technology".

Main features:

- Network design and expansion planning of transmission systems
- System configuration and power system component design
- Star point handling, configuration and grounding systems
- Switching operations, overvoltage protection and insulation coordination
- Harmonics and filter circuits, system perturbations
- Behavior of HVDC systems, static compensators and regulated series compensation

System planning and quality of power distribution and industry networks

Training objectives:

The participants are given detailed information about problems and technically economical power distribution solutions for public power supply networks, industry and other power supply facilities.

The training is intended for:

Employees from power generation, power supply utilities and industry who work in the field of planning and operation of electrical networks and power system protection systems.

Recommended prior knowledge:

Course "Principles of numerical protection technology".

Main features:

- Network design and expansion planning of medium- and low-voltage power distribution systems
- System configuration and power system component design
- Star point handling, configuration of grounding systems and influences of power supply systems
- Operating behavior and dynamics of industrial networks with large numbers of machine
- Switching operations, overvoltage protection and insulation coordination
- Harmonics and filter circuits, system perturbations



Germany

Duration: 3 days
Code No.: 9CA4025-OTE00-OJA2
Language: English
Location: Nuremberg
Price: 1,730 EUR

Dates:
 25.03. - 27.03.2009

Contact:
 Gabriele Gundacker
 Phone: +49 911 433-7416
 Fax: +49 911 433-7929
 E-mail:
 gabriele.gundacker@siemens.com



USA

Duration: 4.5 days
Code No.: 9CA4025-1TA00-OJD4
Language: English
Location: Schenectady, Houston
Price: 2,700 USD

Dates:
 19.01. - 23.01.2009 (S)
 08.06. - 12.06.2009 (S)
 02.11. - 06.11.2009 (H)
 Schenectady (S)
 Houston (H)

Contact:
 USA Siemens Power Academy
 Phone: +1 518 395-5005
 Fax: +1 518 346-2777
 E-mail:
 pti-edpro.ptd@siemens.com



Germany

Duration: 3 days
Code No.: 9CA4025-OTE00-OJA4
Language: English
Location: Nuremberg
Price: 1,985 EUR

Dates:
 06.07. - 08.07.2009

Contact:
 Gabriele Gundacker
 Phone: +49 911 433-7416
 Fax: +49 911 433-7929
 E-mail:
 gabriele.gundacker@siemens.com



Germany

Duration: 2 days
Code No.: 9CA4025-OTE00-OJA6
Language: English
Location: Nuremberg
Price: 1,325 EUR

Dates:
 19.03. - 20.03.2009

Contact:
 Gabriele Gundacker
 Phone: +49 911 433-7416
 Fax: +49 911 433-7929
 E-mail:
 gabriele.gundacker@siemens.com

General Power Engineering Courses

Introduction to distribution systems and power circuit analysis

Training objectives:

The main objective of this training is to improve the participant's understanding of power circuit analysis and distribution systems

The training is intended for:

The material is especially suited for any engineer who did not receive fundamental training in power systems or for those who wish to receive a refresher.

Recommended prior knowledge:

Participants should have a four-year engineering degree with college level courses in geometry, trigonometry, matrix algebra, and physics.

Main features:

- The training reviews the fundamental methods used in the steady-state analysis of AC circuits as applied to power distribution systems including:
 - Basics of power system engineering
 - Matrices and network solution methods
 - Three-phase power systems
 - The per-unit system
 - Symmetrical components
 - Fault currents and Thevenin and Norton equivalents
 - Overview of the power delivery systems
 - Introduction to reliability and power quality
 - Distribution system configuration
 - Distribution equipment
 - Voltage drop
 - Voltage regulation
 - Load types: lighting, motors and load cycles
 - Power factor correction and capacitor applications



USA

Duration: 4.5 days
Code No.: 9CA4025-1TA00-OJB1
Language: English
Location: Schenectady
Price: 2,700 USD

Dates:
05.01. - 09.01.2009
11.05. - 15.05.2009
06.07. - 10.07.2009

Contact:

USA Siemens Power Academy
Phone: +1 518 395-5005
Fax: +1 518 346-2777
E-mail:
pti-edpro.ptd@siemens.com

Distribution planning and reliability assessment

Training objectives:

Part 1 of the training emphasizes the distribution planning process including load forecasting, expansion and system reinforcement, economics, power flow, breaker duty, and practical case studies.

Part 2 emphasizes practical calculation of reliability measures.

Theory and definitions are covered in introductory lecture sessions and illustrated through examples in hands-on sessions.

The training is intended for:

The planning section is geared for engineers new to the distribution area.

Recommended prior knowledge:

The structure of the training presumes that participants are engineers familiar with power system planning and/or operations.

Main features:

- Introduction to planning
 - What is a distribution system?
 - Loads
 - Planning criteria
 - Analyzing a distribution system
 - Distribution planning options
- Reliability
 - Protection and coordination
 - Reliability index theory
 - IEEE surveys and industry practices
 - Hands-on examples using DRA program
 - Making value-based planning decisions
 - Fault reduction
 - Outage statistics
 - Setting reliability targets
 - Cost-benefit analysis
 - Choosing the best reliability solution



USA

Duration: 2 days
Code No.: 9CA4025-1TA00-OJD5
Language: English
Location: Schenectady, Houston
Price: 1,650 USD

Dates:
23.07. - 24.07.2009 (S)
09.11. - 10.11.2009 (H)
Schenectady (S)
Houston (H)

Contact:

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Fax: +1 518 346-2777
E-mail:
pti-edpro.ptd@siemens.com

Power system reliability

Training objectives:

The participants will be able to understand the correlation and mode of actions of different measures influencing power system reliability.

The training is intended for:

Training presumes that participants are engineers involved in power system design, planning or operation.

Recommended prior knowledge:

Fundamentals of power system engineering and the basic mathematical skills, such as trigonometry, complex numbers, matrix algebra, and applied calculus.

Main features:

- Introduction to planning
- Reliability
- Protection and coordination
 - Reliability index theory
 - Basic concepts
 - Index definitions
 - Failure rate calculations
 - "Manual"-calculations
 - IEEE surveys and industry practices
 - Hands-on examples using DRA program
 - Comparison of protective schemes
 - Comparison of failure rates by cause code
- Making value-based planning decisions
- Using total cost concept
 - Outage duration distributions
 - Cost of reliability interruptions for residential, commercial and industrial customers

• Load – surveys and data sources

- Fault reduction
- Tree trimming
- Animal protection
- Lightning protection
- Outage statistics
- Weather effects
- Independent and dependent outages
- Outage data bases – data sources
- Setting reliability targets
- Cost-benefit analysis
- Ranking mitigation options
- Choosing the best reliability solution



USA

Duration: 2 days
Code No.: 9CA4025-1TA00-OJB4
Language: English
Location: Schenectady
Price: 1,650 USD

Dates:
22.01. - 23.01.2009
01.06. - 02.06.2009
14.10. - 15.10.2009

Contact:

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pti-edpro.ptd@siemens.com

Distribution system losses

Training objectives:

To give participants a better understanding of the nature and characteristics of distribution system losses and teach fundamental methods for effectively modeling, identifying, analyzing and reducing these losses. The course introduces the participant to the basics of utility finance and engineering economics applied to loss evaluations.

The training is intended for:

It will be especially beneficial to distribution engineers or individuals that are involved in system planning, line design and equipment specification as well as individuals that work in the electric utilities. Financial and rate departments are encouraged to attend as well as members of the engineering, operations and construction departments.

Recommended prior knowledge:

The course requires no specialized background in distribution engineering, but does presume a general understanding of distribution system nomenclature and cost analysis.

Main features:

- Fundamental principles and economic considerations
 - Electric utility development
 - Basic utility accounting concepts
 - Utility economic evaluations
 - Introduction to distribution system losses
 - Determination of losses
 - Economic considerations and requirements
- Transformer losses
 - Basic transformer model
 - Transformers and nature of transformer losses
 - Parameters for economic evaluations
 - Minimizing transformer losses
- Line losses
 - Definition of line losses
 - Relationship between real and reactive power
 - Capacitors
 - Economic replacement of conductors
 - Analyzing distribution feeder costs



USA

Duration: 3 days
Code No.: 9CA4025-1TA00-0JB2
Language: English
Location: Schenectady, Houston
Price: 2,365 USD

Dates:
 20.07. - 22.07.2009 (S)
 05.10. - 07.10.2009 (H)
 Schenectady (S)
 Houston (H)

Contact:

USA Siemens Power Academy
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 Fax: +1 518 346-2777
 E-mail:
 pti-edpro.ptd@siemens.com

Electric system losses

Training objectives:

This training provides participants with an understanding of the nature and characteristics of electric system demand and energy losses, and teaches methods for effectively modeling, analyzing, allocating and reducing these losses.

The training is intended for:

It will be especially beneficial to transmission, distribution, and operating engineers involved in planning, design, rates, equipment specifications, and system operations.

Recommended prior knowledge:

The structure of the course requires no specialized background in transmission or distribution engineering or planning, but does presume a general understanding of the nomenclature.

Main features:

- Overview of electric system losses
- Fundamental principles
- Calculation by losses subsystem
- Economic considerations



USA

Duration: 1 day
Code No.: 9CA4025-1TA00-0JD3
Language: English
Location: Schenectady
Price: 2,700 USD

Dates:
 26.06.2009

Contact:

USA Siemens Power Academy
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 E-mail:
 pti-edpro.ptd@siemens.com

Industrial power system applications

Training objectives:

Participants will be able to build, modify and verify power system models and perform required system analysis utilizing commercial software tools such as SINICAL.

The training is intended for:

Engineers who are responsible for the supply of electrical energy to process and manufacturing facilities. Training presumes that participants are engineers involved in power system design, planning or operation.

Recommended prior knowledge:

The structure of the training presumes that participants have a general understanding of industrial power systems but does not presume extensive planning or operating experience.

Main features:

- System planning
- Fundamentals of power system analysis
- Short circuit studies
- Power flow studies
- Static motor starting studies
- Power factor and related considerations
- Grounding
- Specialized studies



USA

Duration: 4.5 days
Code No.: 9CA4025-1TA00-0JA5
Language: English
Location: Schenectady
Price: 2,700 USD

Dates:
 10.08. - 14.08.2009

Contact:

USA Siemens Power Academy
 Phone: +1 518 395-5005
 Fax: +1 518 346-2777
 E-mail:
 pti-edpro.ptd@siemens.com

Low-voltage secondary networks

Training objectives:

The participants will use basic applications in design, operation, and protection practices used for both dedicated feeder grid and spot network systems, and for non-dedicated feeder spot network systems.

The training is intended for:

Engineers and technicians involved with secondary networks.

Recommended prior knowledge:

The training participants should have an engineering degree, an electrical technology background, or practical experience with low-voltage networks.

Main features:

- Fundamentals of system design and operation
- Network relay characteristics and settings
- Basis for master relay close setting
- Reverse current trip setting requirements
- Network voltages during capacitive backfeed to primary
- Non-dedicated feeder spot network analysis
- Primary feeder impedance program
- The Siemens low-voltage spot network simulator
- Protection of 480-volt spot networks
- Closed transition switching/generation on spot networks
- Testing



USA

Duration: 3 days
Code No.: 9CA4025-1TA00-0JD7
Language: English
Location: Schenectady
Price: 2,365 USD

Dates:
 29.07. - 31.07.2009

Contact:

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 Fax: +1 518 346-2777
 E-mail:
 pti-edpro.ptd@siemens.com

General Power Engineering Courses

Distributed generation and energy storage applications on power systems

Training objectives:

This training provides a thorough overview of distributed generation technologies, applications, and system analysis methods.

The student will gain an understanding of DG technologies, DG interconnection practices/requirements and DG impacts on the power system.

The training is intended for:

This training is recommended for engineers, planners and managers who wish to gain knowledge that will help them understand how to select and apply the appropriate distributed generation technologies to the power system as well as how to target utility company strategies toward the most effective use of DG.

Recommended prior knowledge:

No previous experience in distributed generation is required, although a basic understanding of power distribution systems is recommended.

Main features:

- Introduction and historical overview
- Distributed generation technologies
- Cogeneration and heat recovery issues
- Fuel types and emissions
- Static power converters
- Synchronous and induction generators
- Operating behavior under various loading conditions
- Effects of altitude and temperature
- Economics of DG
- Power grid impacts of DG
- Interconnection standards/requirements
- Near and long-term trends in the industry and overall summarizing points



USA

Duration: 2 days
Code nNo.: 9CA4025-1TA00-0JD6
Language: English
Location: Schenectady
Price: 1,650 USD

Dates:
27.07. - 28.07.2009

Contact:

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pti-edpro.ptd@siemens.com

Earthing and interference in high- and low-voltage installations

Training objectives:

The participants will be able to use basic knowledge about protective earthing in high-voltage installation, electromagnetic interference, lightning protection and selection of low-voltage systems in their work environment.

The training is intended for:

Engineers of utilities and industrial power supply, consultants and approving bodies as well as project leaders and design engineers.

Recommended prior knowledge:

Basic knowledge of electrical engineering.

Main features:

- Protective earthing for high-voltage installations
 - Tasks, standards (IEC, IEEE, CENELEC, VDE)
 - Specific soil resistivity (relevance, measurement, analysis)
 - Design example based on VDE 0101 and IEEE 80
 - Measurements to test earthing systems
- Electromagnetic interference
 - Principles and standards
 - High frequency and power frequency interference in and around installations
 - Interference on pipes and telecommunication lines
 - Protection of human beings and biological aspects
- Neutral earthing
 - Theoretical basis and practical approaches
- Lightning protection
 - Relevant standards (IEC 61024-1, VDE V 0185) and determination of protective classes
 - External and internal lightning protection, project examples
- Low-voltage networks
 - Standard systems IEC 60364 (TT, TN-C, TN-S, IT)
 - Protection against indirect contact, parallel infeeds



Germany

Duration: 2 days
Code No.: 9CA4025-0TE00-0JB4
Language: English
Location: Nuremberg
Price: 1,040 EUR

Dates:
on request

Contact:

Gabriele Gundacker
Phone: +49 911 433-7416
Fax: +49 911 433-7929
E-mail:
gabriele.gundacker@siemens.com

Overvoltages and insulation coordination

Training objectives:

The main objective of this training is to improve the participant's understanding of power system transient and overvoltage events such as faults, switching and lightning surges.

The training is intended for:

The training is structured for electrical engineers that have some familiarity with electric power system analysis.

Recommended prior knowledge:

The training is structured for electrical engineers that have some familiarity with electric power system analysis.

Main features:

- Rated voltage stresses
- Overvoltages from faults and Ferranti rise
- Backfeeding
- First order transients
- Second order transients
- Capacitor switching
- Circuit breaker transient recovery voltage
- Fault current asymmetry
- Transformer inrush currents
- Ferroresonance
- Blackstart
- Traveling waves
- Switching surges from line energizing
- Lightning surges on transmission lines
- Surge arrester behavior
- Surge arrester construction
- Surge arrester applications
- Protective margins and insulation coordination



USA

Duration: 4.5 days
Code No.: 9CA4025-1TA00-0JF8
Language: English
Location: Schenectady
Price: 2,700 USD

Dates:
02.11. - 06.11.2009

Contact:

USA Siemens Power Academy
Phone: +1 518 395-5005
Fax: +1 518 346-2777
E-mail:
pti-edpro.ptd@siemens.com

System dynamics – Stability and oscillations

Training objectives:

The participants receive essential knowledge on system dynamics, system oscillations and damping and countermeasures in transmission systems and at the generators.

The training is intended for:

Engineers and technicians of power utilities and industries who deal with control, dynamics and protection.

Recommended prior knowledge:

Basic knowledge of electricity.

Main features:

- System stability
- Power system oscillation
- Interarea oscillation
- Multimachine systems
- Increase of system damping (PSS, FACTS, HVDC)
- Methods of time domain calculation
- Eigenvalue calculations
- Training with a simulation tool



Germany

Duration: 2 days
Code No.: 9CA4025-0TE00-0JB3
Language: English
Location: Nuremberg
Price: 1,325 EUR

Dates:
on request

Contact:

Gabriele Gundacker
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Fax: +49 911 433-7929
E-mail:
gabriele.gundacker@siemens.com

Power system dynamics

Training objectives:

Engineers in operations will gain an understanding of dynamic effects encountered in daily operation of the system and necessary in planning contingencies.

The training is intended for:

This training is recommended for engineers seeking an introduction to the techniques used in the electric utility industry for power system scheduling and control.

Recommended prior knowledge:

Participants should have a degree in electrical engineering and be familiar with load flow and stability topics.

Main features:

- Overview of power system dynamics
- Power system models for generation control
- Power system stability concepts
- System design for stability
- Frequency response techniques
- Synchronous machine models
- Load flow criteria in system design
- Reactive support – condensers and static
- Induction machines
- Series capacitors
- Sub-synchronous oscillations
- Shaft torques
- DC transmission
- Load characteristics
- Voltage collapse
- Out-of-step protection
- Discussion



USA

Duration: 4.5 days
Code No.: 9CA4025-1TA00-0JB7
Language: English
Location: Schenectady
Price: 2,700 USD

Dates: 09.02. - 13.02.2009

Contact:

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 Phone: +1 518 395-5005
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 pti-edpro.ptd@siemens.com

Fundamentals of protective relaying

Training objectives:

This training provides participants with an understanding of the protective devices and systems commonly used in generation, transmission, subtransmission, and distribution systems.

The training is intended for:

Training presumes that participants are engineers involved in power system design, planning or operation.

Recommended prior knowledge:

Fundamentals of power system engineering and the basic mathematical skills, such as trigonometry, complex numbers, matrix algebra, and applied calculus.

Main features:

- Protection fundamentals and applications
- Protection applications
- Coordination with overcurrent relays (a hands-on study)
- Distribution overcurrent protection



USA

Duration: 3.5 days
Code No.: 9CA4025-1TA00-0JA2
Language: English
Location: Schenectady, Houston
Price: 2,515 USD

Dates: 14.01. - 16.01.2009 (S)
 20.05. - 22.05.2009 (S)
 30.11. - 02.12.2009 (H)

Schenectady (S)
 Houston (H)

Contact:

USA Siemens Power Academy
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 Fax: +1 518 346-2777
 E-mail:
 pti-edpro.ptd@siemens.com

Wide-area measurement – Instrument, protection and control technology of the future

Training objectives:

The participants adept black out causes and experience counter-active measures. One measure is the improvement of system monitoring by use of “phase measurement units” (PMUs) and the erection of “wide area” meter systems.

Worldwide development trends of these measurement systems are presented and their implementation is part of discussion.

The training is intended for:

Experienced employees of utilities, active in planning, protection and mains operation.

Recommended prior knowledge:

Experience in network planning and network protection.

Main features:

- Principles and devices of the “wide-area” measuring systems (WAMS)
- Requirements on communication technology
- Example for “wide-area”-measuring systems
- Applications of “wide-area”-measuring systems
- Future prospects



Germany

Duration: 2 days
Code No.: 9CA4025-0TE00-0JB7
Language: English
Location: Nuremberg
Price: 1,325 EUR

Dates: on request

Contact:

Gabriele Gundacker
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 Fax: +49 911 433-7929
 E-mail:
 gabriele.gundacker@siemens.com

Power distribution systems economics

Training objectives:

The training instructs participants on how to apply both macroscopic and microscopic analysis techniques, to develop practical solutions, and to effectively minimize overall distribution system costs.

The training is intended for:

Training is especially beneficial to distribution engineers involved in system design, operation, and equipment specification development.

Main features:

- Analysis of the overall electric utility system by use of a macroscopic economic model
 - System planning overview
 - Generation costs
 - Economic effects on the system as a result of the utility considering power purchases, sales and wheeling
 - Size and economic consequences of power losses in various parts of the system
- Analysis of the distribution system by use of a microscopic economic model
 - Cost model applied to distribution system
 - Economics of demand-side management
 - Special economic considerations of developing countries



USA

Duration: 2 days
Code No.: 9CA4025-1TA00-0JD8
Language: English
Location: on request
Price: 1,650 USD

Dates: 03.08. - 04.08.2009
 19.11. - 20.11.2009

Contact:

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 pti-edpro.ptd@siemens.com

Overview of competitive energy markets

Training objectives:

This training will provide participants with a better understanding of standard market Design and the fundamentals underlying LMP energy markets.

The training is intended for:

This training is designed for developers, merchants, traders, policy makers, RTO participants and others involved in the move towards a standard market design for the electricity industry.

Recommended prior knowledge:

There are no prerequisites other than an interest in the subject.

Main features:

- Introduction and evolution
- Power system operation
- LMP market fundamentals
- Market settlement
- Transactions
- Ancillary services
- New transmission service
- Transmission expansion
- Long-term resource adequacy
- Data modeling, SCUC and SCED
- Example: Analyses of LMP markets



USA

Duration: 3 days
Code No.: 9CA4025-1TA00-OJA7
Language: English
Location: San Jose, Schenectady, Denver
Price: 2,365 USD
Contact:
 USA Siemens Power Academy
 Phone: +1 518 395-5005
 Fax: +1 518 346-2777
 E-mail: pti-edpro.ptd@siemens.com

Dates:
 09.03. - 11.03.2009 (SJ)
 05.08. - 07.08.2009 (S)
 16.11. - 18.11.2009 (D)
 San Jose (SJ)
 Schenectady (S)
 Denver (D)

Power system scheduling and operation

Training objectives:

This training provides participants with an understanding of current methods and techniques used to schedule and operate electric power supply systems in an economic and secure manner.

The training is intended for:

This training is recommended for engineers seeking an introduction to the techniques used in the electric utility industry for power system scheduling and control. Engineers currently working in scheduling and operations functions will benefit most from this training.

Recommended prior knowledge:

An engineering degree with basic knowledge of electric utility systems is desirable.

Main features:

- Training overview
- Characteristics of generating units
- Economic dispatch
- Unit commitment
- Generation control
- Interchange evaluations and power pools
- Operating security
- State estimation



USA

Duration: 3 days
Code No.: 9CA4025-1TA00-OJB3
Language: English
Location: Schenectady
Price: 2,515 USD
Contact:
 USA Siemens Power Academy
 Phone: +1 518 395-5005
 Fax: +1 518 346-2777
 E-mail: pti-edpro.ptd@siemens.com

Analytical methods for voltage control and reactive power planning

Training objectives:

The training provides a thorough coverage of today's voltage and reactive power planning issues, and of the tools and procedures that are most effective in studying them.

The training is intended for:

Power system designers, planners, or operators.

Recommended prior knowledge:

This training is most beneficial to those who have had at least a year of experience in power system design, planning, or operation. Power flow analysis experience is recommended but not essential.

Main features:

- Overview
- Equipment voltage characteristics
- Analytical tools
- Analytical methods
- Voltage characteristics
- Bulk system voltage characteristics
- Reactive power planning
- Review and closing discussion

Note:

This training is offered in two formats:

The three-day format focuses on lecture and discussion sessions, including case studies of actual system events. This format is presented in a three-hour morning and afternoon session each day.

The five-day format combines hands-on case studies with the lecture and discussion sessions, providing a more in-depth view at voltage phenomena. This format is presented in nine three-hour morning and afternoon sessions for the first four days and a morning session for the fifth day.



USA, United Kingdom

Duration: 4.5 days (S, MT), 3 or 5 days (MA)
Code No.: 9CA4025-2TE00-OJF2 (MA)
Language: English
Location: Schenectady, Minnetonka, Manchester or client's site
Price: 1,700 USD (S, MT), on request (MA)
Contact:
 USA Siemens Power Academy
 Phone: +1 518 395-5005
 Fax: +1 518 346-2777
 e-mail: pti-edpro.ptd@siemens.com

Dates:
 09.03. - 13.03.2009 (S)
 21.09. - 25.09.2009 (MT)
 on request (MA)
 Schenectady (S)
 Minnetonka (MT)
 Manchester or client's site (MA)

Wendy Ashton (Manchester)
 Phone: +44 161 446-5200
 Fax: +44 161 446-6431
 E-mail: wendy.ashton@siemens.com

Fundamentals of overhead transmission line design

Training objectives:

This training provides participants with an understanding of the design of 69 to 765 kV transmission lines with special emphasis on the basics: component parts of lines and their functions, insulation, electrical environmental effects of fields and noise, selection of conductors and structures, and integration into an overall design.

The training is intended for:

The training covers fundamental electrical and mechanical design, but is not a detailed treatment of civil engineering design of structures.

Recommended prior knowledge:

The structure of the training presumes that participants have a degree in electrical or mechanical engineering, or equivalent, with an interest in design of transmission lines.

Main features

- Line design overview
- Power system constraints
- Environmental effects
- Voltage stresses
- Insulation
- Conductors
- Catenaries
- Thermal ratings
- Structures/Foundations
- Tower grounding
- Project management of line design and construction
- Voltage uprating
- Thermal uprating



USA

Duration: 4.5 days
Code No.: 9CA4025-1TA00-OJF1
Language: English
Location: Schenectady
Price: 2,700 USD
Contact:
 USA Siemens Power Academy
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 Fax: +1 518 346-2777
 E-mail: pti-edpro.ptd@siemens.com

Overhead transmission line uprating

Training objectives:

This training will address the main issues to be taken into account for the uprating of overhead transmission lines.

The training is intended for:

The training is intended for those who work with power system planning and operation, as well as for those who work with design, construction, and maintenance of overhead transmission lines. It is also valuable for electric utility managers and decision-makers.

Recommended prior knowledge:

The structure of the training presumes that participants are engineers or have an equivalent experience.

Main features:

- Power flow analysis
- Transmission congestion
- Power system transfer capability
- Motivation for overhead line uprating
- Uprating feasibility analysis
- Line environmental disturbances
- Voltage stresses and line insulation
- Voltage uprating
- Conductor temperature and line thermal rating
- Thermal uprating
- Technical assessment of the existing line
- Voltage and thermal uprating case studies



USA

Duration: 3 days
Code No.: 9CA4025-1TA00-0JF3
Language: English
Location: Schenectady
Price: 2,356 USD

Contact:

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 Phone: +1 518 395-5005
 Fax: +1 518 346-2777
 E-mail:
 pti-edpro.ptd@siemens.com

Distribution transformers, grounding and protection

Training objectives:

The participant will have developed an awareness and understanding of numerous areas, which must be considered when applying distribution transformers.

The training is intended for:

The participants should have an engineering degree, an electrical technology background, or practical experience in power distribution system design and operation.

Recommended prior knowledge:

The training is intended for electric utility engineers and technicians involved in distribution planning, engineering, standards, protection, and operation of the distribution system. It is also valuable to engineers involved in consulting and the design of industrial and commercial power systems, as well as educators not familiar with the practical aspects of transformer application.

Main features:

- Primary and secondary distribution systems/connections for different services/connections to be avoided
- Single-phase transformer basics
- Delta delta bank application concerns
- Open-wye open-delta abnormal conditions
- Grounded-wye grounded-wye transformer tank heating
- Cable-fed transformer characteristic comparison
- Secondary fault currents/single-phase three wire/open-wye open-delta/symmetrical floating-wye delta
- High-to-low faults
- Floating-wye delta fault calculation program (YDELFTLT)
- Ungrounded secondary system phase-to-ground voltages
- Ferroresonance in overhead and underground systems
- Floating-wye delta bank switching with load
- Transformer bank loading equations (4-w delta/4-w wye)
- Fuse application to single-phase distribution transformers
- Voltage unbalance in 4-wire delta secondary systems
- Distribution system grounding
- Basic overcurrent relays
- Switching and isolation devices
- Coordination of protective devices



USA

Duration: 3 days
Code No.: 9CA4025-1TA00-0JC8
Language: English
Location: Schenectady (S), Houston (H)
Price: 2,365 USD

Contact:

USA Siemens Power Academy
 Phone: +1 518 395-5005
 Fax: +1 518 346-2777
 E-mail:
 pti-edpro.ptd@siemens.com

Transformer diagnostics

Training objectives:

The participants will become acquainted with transformer diagnostics. This includes constructive types and characteristics as well as their applicability to power generation, transmission and distribution.

The training is intended for:

Training is intended to address major topics related to the aging infrastructure of power transmission and distribution systems, particularly of power transformers.

Recommended prior knowledge:

The training participant should have bachelor or associated electrical engineering degree or equivalent and basic understanding of transformer functionality and its equivalent circuits and applicability. It is expected that the participant understands basic principles of electromagnetism and its fundamental laws applied to energy conversion. Knowledge of phase diagrams, power factor, lagging vs. leading currents, magnetic hysteresis and core saturation are also welcome.

Main features:

- Power transformers
- Understanding standards and guides
- Essential specification
- Transformer as a "thermal machine"
- IEEE loading guide
- Factory virtual tour
- Transformer aging
- Diagnostic techniques
- Dissolved gas analysis (DGA)
- Oil quality analysis
- Bushing tests
- Maintenance criteria
- On-line monitoring system
- The repair x replace dilemma
- New challenges
- Comprehensive assessment program



USA

Duration: 3 days
Code No.: 9CA4025-1TA00-0JE8
Language: English
Location: Schenectady
Price: 2,365 USD

Contact:

USA Siemens Power Academy
 Phone: +1 518 395-5005
 Fax: +1 518 346-2777
 E-mail:
 pti-edpro.ptd@siemens.com

Distribution surge protection

Training objectives:

The main objective of this training is to improve the participant's understanding of distribution system insulation coordination and surge arrester applications that provide overvoltage protection from events such as switching and lightning surges.

The training is intended for:

The training is structured for electrical engineers that have some familiarity with electric power distribution systems.

Main features:

- Lightning surges
- Voltage ratings of circuits and equipment
- Surge arresters
- Insulation coordination
- Overvoltage protection of
 - Substations
 - Overhead lines
 - Underground cable circuits
 - Primary distribution equipment
 - Secondary circuits



USA

Duration: 2 days
Code No.: 9CA4025-1TA00-0JD1
Language: English
Location: Schenectady (S), Houston (H)
Price: 1,650 USD

Contact:

USA Siemens Power Academy
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 Fax: +1 518 346-2777
 E-mail:
 pti-edpro.ptd@siemens.com

General Power Engineering Courses

Power electronics in transmission systems (HVDC, FACTS) and wind power

Training objectives:

This training provides participants with a comprehensive understanding of HVDC systems, FACTS devices, and alternative energy sources as well as technical problems that may be encountered when installing these elements in an existing power system. The training presents operating and control fundamentals along with discussing modeling principles and advanced analytical tools available. Emphasis on use of the Siemens PSS®E program is made and detailed hands-on examples are used to better understand power electronics performance.

The training is intended for:

The structure of the course presumes that participants have a degree in electrical engineering and are familiar with load flow and/or dynamic calculations. Experience in using PSS®E is strongly encouraged.

Recommended prior knowledge:

Fundamentals of power system engineering and the basic mathematical skills, such as trigonometry, complex numbers, matrix algebra, and applied calculus.

Main features:

- Introduction
- Conventional HVDC systems
- Latest HVDC technologies
- FACTS technologies
- Alternative energy sources
- Wind turbines and plants



USA

Duration: 4.5 days
Code No.: 9CA4025-1TA00-0JB6
Language: English
Location: Schenectady
Price: 2,700 USD

Dates:
02.02. - 06.02.2009
16.11. - 20.11.2009

Contact:

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Fax: +1 518 346-2777
E-mail:
pti-edpro.ptd@siemens.com

Fundamentals of the oil and gas Industry

Training objectives:

The 5 days training enables the participants to understand fundamentals of the oil and gas industry process. During the training, definitions, methods and tools will be described. Starting with general topics, all essential elements such as drilling, reservoir engineering, production engineering, storage and transport and sales through to refinery will be explained.

The training is intended for:

Engineers
Sales people

Main features:

- Overview
- Reservoir engineering
- Drilling technologies
- Oil and gas production
- Oil and gas transport
- Refinery
- Siemens products and solutions



Austria

Duration: 5 days
Code No.: 9CA4070-3WE00-0EA1
Language: English
Location: Vienna
Price: 2,100 EUR

Dates:
02.02. - 06.02.2009
20.04. - 24.04.2009
29.06. - 03.07.2009

Contact:

Monika Schuecker
Phone: +43 51707 31143
Fax: +43 51707 55243
E-mail:
power-academy.at@siemens.com

Fundamentals of power flow analysis with applications

Training objectives:

The training objectives are to educate the participants in the fundamental theory of steady-state power flow, network modeling and solution methods, along with various applications such as contingency and transfer limit analysis, reactive power and voltage control.

The training is intended for:

The participants for this training seek an education in steady-state power flow analysis of electric power systems.

Recommended prior knowledge:

An engineering degree with knowledge of basic electrical circuit theory is desirable. No prior experience with power flow simulation is required.

Main features:

- Review of voltage, current and power in balanced three-phased systems
- The per-unit system
- Generating plant models
- Load models
- Introduction to PSS®E
- Electrical characteristics of transmission lines and cables
- Line model
- Active and reactive power transfer on a line
- Reactive compensation of lines and cables
- Power factor correction
- Transformer ratings
- Two- and three-winding transformer models
- Load tap changing transformers
- Phase-angle regulators
- Modeling of non-conventional devices (FACTS and wind farms)
- Iterative methods for solving the power flow problem
- DC and AC solutions

- Gauss-Seidel and Newton-Raphson solution methods
- Solving difficult power flow cases
- Inertial and governing power flow solutions
- Reactive power flow and voltage control
- Contingency analysis
- Performance indexes
- Network sensitivity factors
- Power transfer limit analysis
- Voltage collapse
- Network models

Note:

The most recent version of Siemens PTI's PSS®E power flow program will be used for the class examples and problems.



United Kingdom

Duration: 3 days
Code No.: 9CA4055-2VE00-0KC2
Language: English
Location: Manchester or client's site
Price: on request

Dates:
on request

Contact:

Wendy Ashton
Phone: +44 161 446-5200
Fax: +44 161 446-6431
E-mail:
wendy.ashton@siemens.com

Introduction to power system dynamics

Training objectives:

This training will familiarize engineers with basic dynamic phenomena in power systems. Emphasis will be placed on modeling power system components for dynamic simulations.

The training is intended for:

This training is offered to familiarize new users with the dynamic simulation features of the PSS®E program.

Recommended prior knowledge:

Participants should have a degree in electrical engineering and be familiar with load flow and stability topics.

Main features:

- Introduction
- Modeling of synchronous generators
- Modeling of excitation systems
- Modeling of speed governor systems
- Modeling of loads
- Steady-state stability
- Transient stability
- Case studies

Note:

This course is held in UK and is presented in a 3-day period (as opposed to the 4.5-day duration in the USA). Market research, previous delegate feedback and generally smaller class sizes have indicated that 3 days is the desired and optimum duration for this course. As with all courses, comprehensive printed notes and associated documentation are provided along with sufficient hands-on examples sessions throughout the course duration.



USA, United Kingdom

Duration: 4.5 days (S), 3 days (MA)

Dates:

Code No.: 9CA4025-1TA00-OJA1 (S)

13.04. - 17.04.2009 (S)

9CA4055-2VE00-OKC1 (MA)

14.09. - 18.09.2009 (S)

Language: English

on request (MA)

Location: Schenectady,
Manchester or client's site

Schenectady (S)

Price: 2,700 USD (S), on request (MA)

Manchester (MA)

Contact:

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E-mail: wendy.ashton@siemens.com

Power system small-signal stability and stabilizer tuning

Training objectives:

This training will provide participants with insight into the small-signal stability problem and how it can be mitigated by the PSS application. Methods for stabilizer placement and practical tuning techniques will be discussed for the various PSS types.

The training is intended for:

Training presumes that participants are engineers involved in power system design, planning or operation.

Recommended prior knowledge:

Participants should be familiar with basic control systems theory, such as LaPlace transforms, block diagrams, frequency response techniques, and Bode diagrams. Some background or exposure to synchronous machine theory is also desirable.

Main features:

- Power system stability fundamentals
- Linear system dynamic analysis methods
- Dynamic characteristics of generators and excitation systems
- Oscillatory (dynamic) stability and power system stabilizers
- AVR and PSS tuning, testing and commissioning
- Practical considerations
- Various types of PSS application scenarios
- Hands-on example
- Continuation of hands-on exercises, review, and discussion
- Initialization
- Setup documentation
- Running PSS®E
- Running dynamics simulations
- Examining results
- Model library overview
- Sanity checking
- Response tests
- Setup modifications
- Model writing introduction



USA

Duration: 3.5 days

Dates:

Code No.: 9CA4025-1TA00-OJB5

09.11. - 12.11.2009

Language: English

Location: Schenectady

Price: 2,500 USD

Contact:

USA Siemens Power Academy

Phone: +1 518 395-5005

Fax: +1 518 346-2777

E-mail:

pti-edpro.ptd@siemens.com

Basics of power quality

Training objectives:

The training participants will get an understanding of the interaction between electrical network and load. Methods how to improve these interactions to avoid or remove these disturbances. The trainees obtain theoretical knowledge about backgrounds and variations of "power quality". They learn strategies how to solve problems at hand by discussing case studies.

The training is intended for:

Employees of electrical distribution companies and the industrial sector who are responsible for planning, engineering and operation of networks with medium and high power.

Recommended prior knowledge:

Basics of electrotechnical knowledge.

Main features:

- Understanding of "power quality"
- Voltage quality
 - voltage sag
 - flicker
 - harmonics
- Supply quality
 - voltage outage
- Standards and recommendations
- Sensitivity of loads
- Measurement technology
- The meaning of reactive power
- Remedies, for example
 - passive filters
 - active filters
- Presentation of case studies



Germany

Duration: 2 days

Dates:

Code No.: 9CA4030-OKE00-OBA2

23.03. - 24.03.2009

Language: English

07.09. - 08.09.2009

Location: Nuremberg

Price: 1,490 EUR

Contact:

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PSS®E Introduction to power flow and fault analysis

Training objectives:

Upon completion of the training, new PSS®E users will be acquainted with most program functions in sufficient detail for them to begin study work relevant to power flow, fault analysis and other types of steady-state analysis. The training does not include the PSS®E optimal power flow, which is offered as a separate training.

The training is intended for:

This training is offered to familiarize new users with the power flow and fault analysis sections of the PSS®E program.

Recommended prior knowledge:

While no experience with the program is required, it is assumed that participants are familiar with electric network modeling fundamentals, symmetrical component theory of polyphase systems, and power system analysis methods. The fundamentals of working with computers and editors are required.

Main features:

- Introduction to PSS®E
- Basic power flow modeling data
- Creating one-line diagrams
- Power flow solution and reports
- Data addition and modification
- Features of the new interface
- Data checking
- Program automation
- Contingency and transfer limit analyses
- Balanced switching
- Fault analysis
- Line properties calculator
- Data management
- Network reduction
- Special applications



USA, United Kingdom

Duration: 4.5 days (H,S,MT), 3 days (MA) **Dates:** 12.01. - 16.01.2009 (H)
Code No.: 9CA4055-1VA00-OKA1 (H,S,MT), 20.04. - 24.04.2009 (S)
Language: English
Location: Houston, Schenectady, 20.07. - 24.07.2009 (MT)
 Minnetonka, Manchester 21.09. - 25.09.2009 (S)
Price: 2,700 USD (H,S,MT) 06.10. - 08.10.2009 (MA)
 1,195 GBP (MA)
Contact: Houston (H)
 USA Siemens Power Academy Schenectady (S)
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 Fax: +1 518 346-2777 Manchester (MA)
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Wendy Ashton (Manchester)
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 Fax: +44 161 446-6431
 E-mail: wendy.ashton@siemens.com

PSS®E Advanced power flow

Training objectives:

This training provides experienced PSS®E users with instruction in the use of PSS®E at an advanced level. The training is structured to include lecture sessions and hands-on exercises for selected topics.

The training is intended for:

This training is designed for experienced PSS®E users.

Recommended prior knowledge:

Participants should either have setup and operating experience with power flow of power systems or Course "PSS®E Introduction to power flow and fault analysis".

Main features:

- What's new in PSS®E
- Load flow and short circuit interface
- Transformer modeling
- Fault analysis applications
- Modeling of FACTS devices
- Voltage analysis
- Introduction to optimal power flow
- Contingency analysis
- PV and PQ analysis
- Program automation

Note:

PSS®E "Introduction" and "Advanced" PSS®E scheduled courses held in UK (Manchester) are presented during a 3-day period (as opposed to the 4.5-day duration in the USA). Previous delegate feedback and generally smaller class sizes have indicated that 3 days is the desired and optimum duration for such courses. As with all courses, comprehensive printed notes and associated documentation are provided along with sufficient hands-on examples sessions throughout the course duration.



USA, United Kingdom

Duration: 4.5 days (S, MT), 3 days (MA) **Dates:** 10.03. - 12.03.2009 (MA)
Code-no.: 9CA4055-1VA00-KB7 (S, MT) 23.03. - 27.03.2009 (S)
 9CA4055-2VE00-OKA6 (MA) 26.10. - 30.10.2009 (MT)
Language: English
Location: Schenectady, Minnetonka, Schenectady (S),
 Manchester Minnetonka (MT),
 Manchester (MA)
Price: 2,700 USD (MT)
 1,195 GBP (MA)
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PSS®E Introduction to dynamic simulation

Training objectives:

Upon completion, new PSS®E users will be acquainted with most program functions in sufficient detail for them to begin study work requiring dynamic simulation.

The training is intended for:

When PTI's Power system simulator for engineering (PSS®E) program is installed at a client facility, a training is normally provided. Normal job turnover and reassignment however result in a continual introduction of new program users. This training is offered to familiarize new users with the PSS®E program.

Recommended prior knowledge:

While no experience with the program is required, it is assumed that participants are familiar with generator, turbine control and network protection models. Participants should also be conversant with differential equations and Laplace transformers.

Main features

- Graphical Model Builder introduction
- PSS®E overview
- Power flow and dynamic simulation data
- Running PSS®E and dynamic simulation approach
- Steady state analysis setup
- Initialization
- Setup documentation
- Running PSS®E
- Running dynamics simulations
- Examining results
- Model library overview
- Sanity checking
- Response tests
- Setup modifications
- Model writing introduction

Note:

This course is held in the UK (Manchester) and presented during a 3-day period (as opposed to the 4.5-day duration in the USA). Previous delegate feedback and generally smaller class sizes have indicated that 3 days is the desired and optimum duration for such training. As with all training, comprehensive printed notes and associated documentation are provided along with sufficient hands-on examples sessions throughout the training duration.



USA, United Kingdom

Duration: 4.5 days (H,S,MT) **Dates:** 19.01. - 23.01.2009 (H)
 3 days (MA) 27.04. - 04.05.2009 (S)
Code No.: 9CA4055-1VA00-OKA3 (H,S,MT) 27.07. - 31.07.2009 (MT)
 9CA4055-2VE00-OKA1 (MA) 20.10. - 22.10.2009 (MA)
Language: English
Location: Houston, Schenectady, Houston (H)
 Minnetonka, Manchester Schenectady (S)
Price: 2,700 USD (U,S,MT) Minnetonka (MT)
 1,195 GBP (MA) Manchester (MA)
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PSS®E Advanced dynamic simulation

Training objectives:

This training provides experienced PSS®E users with instruction in the use of PSS®E at an advanced level. The training is structured to include lecture sessions and hands-on exercises for selected topics.

The training is intended for:

This training is directed at the experienced PSS®E user who would like to increase his/her analytical skills for system dynamics.

Recommended prior knowledge:

The participants should either have setup and operating experience with power flow and dynamic simulation of power systems or Course "PSS®E Introduction to power flow and fault analysis" and "PSS®E Introduction to dynamic simulation".

Main features:

- What's new in PSS®E dynamics
 - Overview of new program features
- Dynamic analysis tools
 - Transfer functions, block diagrams
 - Feedback control system concepts
 - Controller tuning and bode plots
- Dynamic overview
 - Disturbance chronology
 - Review of PSS®E stability activities

- Modeling
 - Synchronous machines
 - Excitation systems
 - Turbine/speed governor
 - Wind generation
 - HVDC systems
 - SVC – FACTS
 - Loads – Induction Motors
 - Modeling
 - Use of IMD
 - Load damping and NETFRQ
 - Breakers (line and load relays)
- Data checking and controller tuning
 - Excitation systems
 - Governor models
 - PSS (Power System Stabilizers)
 - SVC (Static Var Compensator)
- Topics on user-written models
 - Basics of model writing and Graphical Model Builder (GMB)
 - Incorporation of user-defined models into a simulation
- Program automation
 - PSAS
- Simulating complex disturbances
 - Stuck breakers
 - Single-pole switching
 - Motor starting
- Extended term dynamics
- Hands-on examples
 - Small-signal stability introduction (NEVA)

Note:

This training is held in UK (Manchester) and is presented during a 3-day period (as opposed to the 4.5-day duration in the USA). Previous delegate feedback and generally smaller class sizes have indicated that 3 days is the desired and optimum duration for such courses. As with all training, comprehensive printed notes and associated documentation are provided along with sufficient hands-on examples sessions throughout the training duration.



USA, United Kingdom

Duration: 4.5 days (S), 3 days (MA) **Dates:**
Code No.: 9CA4055-1VA00-OKB1 (S) 24.03. - 26.03.2009 (MA)
 9CA4055-2VE00-OKA3 (MA) 12.10. - 16.10.2009 (S)

Language: English Schenectady (S)
Location: Schenectady Manchester (MA)
 Manchester

Price: 2,700 USD (S), 1,195 GBP (MA)

Contact:

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PSS®E theory, use and interpretation of small-signal stability analysis (NEVA)

Training objectives:

Purpose of this course is to provide an understanding of small-signal analysis and to demonstrate, using real examples, why small-signal stability is an important tool for use in network planning.

The training is intended for:

This training is valuable to engineers and service technicians who work in operation, planning and design of power systems.

Recommended prior knowledge:

Participants should be knowledgeable in the basic operations of the PSS®E software and how this method can be used to analyze weakly damped power swings in transmission networks.

Main features:

- What is small-signal stability
- Theory of small-signal stability
- Modeling for small-signal stability
- Understanding the results of small-signal stability
- Hands-on examples



USA

Duration: 3 days **Dates:**
Code No.: 9CA4055-1VA00-OKA8 12.01. - 14.01.2009
Language: English
Location: San Jose
Price: 2,365 USD

Contact:

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 Fax: +1 518 346-2777
 E-mail: pti-edpro.ptd@siemens.com

PSS®E Optimal power flow

Training objectives:

This training will provide participants with an understanding of the capabilities of the PSS®E OPF program, introduces them to the many applications and uses for which it has proven to be most beneficial.

The training is intended for:

This training is valuable to engineers and service technicians who work in operation, planning and design of power systems.

Recommended prior knowledge:

Participants should be familiar with the basic operation of the PSS®E load flow program.

Main features:

- Overview and introduction
- Theory and applications
- Special OPF applications



USA

Duration: 3 days **Dates:**
Code No.: 9CA4055-1VA00-OKA4 26.01. - 28.01.2009
Language: English
Location: Houston
Price: 2,365 USD

Contact:

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PSS®E Unleashing the power of Python programming

Training objectives:

To teach participants to develop and apply Python programs and to enhance their capabilities and efficiency when conducting PSS®E load flow, short circuit, and dynamics studies.

The training is intended for:

PSS®E Power systems simulation program is an engineering tool for simulating the behavior of electric power systems with a rich repertoire of features. PSS®E has been expanded to include the Python programming language as a means to automate PSS®E behavior and access simulation results. This course is directed at the PSS®E user who would like to increase his/her productivity and efficiency through the use of this modern scripting language.

Recommended prior knowledge:

It is assumed that participants are proficient in the basic operations of the PSS®E program and have some background in programming or scripting languages. Familiarity with personal computers and text editors is essential for hands-on work. Previous knowledge of python is helpful but not required.

Main features:

- Python language overview
- Input/output processing
- Variables and data structures
- Flow control
- Functions and objects
- Interface with PSS®E
- Accessing PSS®E data
- Looping through buses and branches
- Load flow applications and control
- "IPLAN" programming in Python
- Plotting and graphics
- Interacting with the host operating system
- Text parsing and customized I/O
- Putting it all together: a complete PSS®E Python load flow analysis example



USA, United Kingdom

Duration: 3 days	Dates:
Code No.: 9CA4055-1VA00-OKA5	02.02. - 04.02.2009 (SJ)
(SJ,MT,S,H)	03.02. - 05.02.2009 (MA)
9CA4055-2VE00-OKB3 (MA)	27.04. - 29.04.2009 (MT)
Language: English	28.09. - 30.09.2009 (S)
Location: San Jose, Minnetonka,	14.12. - 16.12.2009 (H)
Schenectady, Houston,	
Manchester	San Jose (SJ)
Price: 2,365 USD (SJ,MT,S,H)	Minnetonka (MT)
1,195 GBP (MA)	Schenectady (S)
	Houston (H)
	Manchester (MA)
Contact:	
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PSS®E Model writing

Training objectives:

This training provides participants with an understanding of the practical and theoretical aspects of dynamic modeling using the latest power system simulation tools. Students will have an opportunity to write computer subroutines by using PSS®E power system simulator program to perform customized functions.

The training is intended for:

This training is designed for PSS®E users who need to write their own PSS®E dynamic models or customize existing models.

Recommended prior knowledge:

Participants should have either setup or operating experience with power flow and dynamic simulation of power systems or should have completed all introductory training in PSS®E.

Main features:

- PSS®E – Program structure
- Block diagrams
- FLECS and FORTRAN
- Equipment models (excitation systems, governors and PSS)
- Structuring the model
- Advanced uses of conec and conet
- Inputting data for user models
- Current injection models
- Modeling special protection schemes (SPS or RAS)
- Model testing
- Extended term simulation
- Introduction in Graphical Model Builder



USA, United Kingdom

Duration: 3 days (S), 2.5 days (MA)	Dates:
Code No.: 9CA4055-1VA00-OKB2 (S)	16.03. - 18.03.2009 (S)
9CA4055-2VE00-OKB7 (MA)	on request (MA)
Language: English	
Location: Schenectady, Manchester (MA)	Schenectady (S)
or client's site	Manchester (MA)
Price: 2,365 USD (S)	
on request (MA)	
Contact:	
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PSS®E Fault analysis

Training objectives:

PSS®E users will be acquainted with program functions in sufficient detail for them to begin study work relevant to fault analysis and transmission line sequence impedance evaluation.

The training is intended for:

The participants for this training seek an education in steady-state power flow analysis of electric power systems.

Recommended prior knowledge:

An engineering degree with knowledge of basic electrical circuit theory is desirable. No prior experience with power flow simulation is required.

Main features:

- Symmetrical components in polyphase systems
- Sequence networks in three-phase systems
- Sequence impedances of synchronous machines
- Sequence impedances of asynchronous machines
- Sequence impedances of transformers
- Grounding connections of transformers
- Sequence impedances of transmission lines
- Sequence charging of transmission lines
- Fault analysis of three-phase systems
- Detailed and classical fault analysis
- Shunt and series fault calculation
- HV circuit breaker interrupting duty evaluation
- Separate pole circuit breaker modeling
- Applied fault analysis standards (ANSI, IEC)

Note:

The most recent version of Siemens PTI's PSS®E power flow program will be used for the class examples.



United Kingdom

Duration: 3 days	Dates:
Code No.: 9CA4055-2VE00-OKB6	on request
Language: English	
Location: Manchester or client's site	
Price: on request	

Contact:
 Wendy Ashton
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PSS®E Transmission reliability study

Training objectives:

Training emphasizes the practical assessment of transmission reliability and the calculation of reliability measures.

The training is intended for:

Training is intended for anyone dealing with reliability concepts and their application and is valuable to all who are involved with transmission systems in the emerging deregulated environment.

Recommended prior knowledge:

They should either have setup and operating experience with power flow calculations or Course "Introduction to PSS®E Power flow and steady-state analysis".

Main features:

- Overview of transmission reliability
- Basic concepts and methods
- Deterministic assessment of bulk transmission reliability
- Addressing reactive power problems
- Transfer capability assessment
- Reliability must-run generation
- Probabilistic assessment of bulk transmission reliability



USA

Duration: 3 days
Code No.: 9CA4055-1VA00-OJF6
Language: English
Location: Schenectady
Price: 2,365 USD

Dates: 30.11. - 02.12.2009

Contact:

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Advanced transmission planning with modern network analysis tools (PSS®E, PSS®MUST, and PSS®E OPF)

Training objectives:

This training provides transmission planners, designers and operators with concepts, tools and methodologies essential to address modern-day issues of competition, open access, wheeling and new technology in transmission planning.

The training is intended for:

Training is intended for the transmission planner and designers.

Recommended prior knowledge:

The structure of the course presumes that participants are power system planners, designers and operators who have had at least a year of involvement in the application of load flows and a working understanding of time simulation applied to network dynamics.

Main features:

- Overview of the transmission planning process
- Outline for a modern transmission planning study
- Planning criteria
- De-coupled thermal capacity and voltage planning
- AC contingency analysis
- Transfer limit analysis
- Dynamic simulation
- Synthesis of transmission plans
- Developing a feasible transmission plan



USA

Duration: 4.5 days
Code No.: 9CA4025-1TA00-OJF7
Language: English
Location: Schenectady
Price: 2,700 USD

Dates: 05.10. - 09.10.2009

Contact:

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 pti-edpro.ptd@siemens.com

PSS®E Wind power technology and wind modeling

Training objectives:

To provide engineers with a comprehensive understanding of the technology, theory and concepts of wind power, and a detailed overview of steady-state and dynamic modeling concepts and practice. The course presents operating and control fundamentals along with discussion of modeling principles and advanced analytical tools available. Emphasis on use of the PSS®E software is made and detailed hands-on examples are used to better understand the modeling. An up-to-date review of specific turbine model packages developed for PSS®E will be given.

The training is intended for:

As wind farms become a larger part of the total generation of power systems worldwide, issues related to turbine technology, grid integration, steady-state operation and control of the utility network and effects on overall system stability become increasingly important. Up-to-date experience and knowledge, coupled with accurate load flow and dynamic simulation models (encompassing all significant air-dynamical, mechanical and electrical factors) are necessary to evaluate the impact of wind farms on power systems. Power system operators and planners need to understand how wind power generation interacts with power systems and what analytical tools are available for system studies to assess wind turbine performance and ensure grid compatibility and compliance with relevant codes and regulations.

Recommended prior knowledge:

Participants should have a degree in electrical engineering and be familiar with load flow and dynamic calculations. Experience in using PSS®E (for both steady-state and dynamic analysis) is essential.

Main features:

- Wind power technology, theory and concepts
- Steady-state modeling of wind power
- Dynamic modeling of wind power
- Review of PSS®E wind models
- Hands-on examples



United Kingdom

Duration: 3 days
Code No.: 9CA4055-2VE00-OKB5
Language: English
Location: Manchester
Price: 1,195 GBP

Dates: 17.02. - 19.02.2009

Contact:

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 wendy.ashton@siemens.com

PSS®E Modeling wind farms

Training objectives:

This training will cover a wide range of topics related to modeling and application of wind power. A general summary of specific wind turbine model packages developed by Siemens PTI for PSS®E will be given to highlight the latest developments and increase awareness of model contents and availability.

The training is intended for:

Training presumes that participants are engineers involved in power system design, planning or operation.

Recommended prior knowledge:

The structure of the training presumes that participants have either setup or operating experience with power flow and dynamic simulation of power systems or Course "PSS®E Introduction to power flow and fault analysis" and "PSS®E Introduction to dynamic simulation"

Main features:

- General concepts
- Modeling wind farms and turbines for load flow
- Modeling wind farms and turbines for stability studies
- PSS®E wind power software packages
- Utility/application issues
- Hands-on: Setting up load flow and dynamics with wind farms employing different wind turbines



USA

Duration: 2 days
Code No.: 9CA4025-1TA00-OJA6
Language: English
Location: Schenectady
Price: 1,650 USD

Dates: 26.01. - 27.01.2009

Contact:

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PSS®MUST Managing and utilizing system transmission

Training objectives:

Participants of this training will gain an understanding how to efficiently calculate first contingency incremental transfer capacity (FCITC), and the sensitivity of the FCITC to uncertainties, forming a quantitative basis for OASIS postings.

The training is intended for:

This training is especially beneficial to utility and consulting engineers who are involved in the transmission transfer capability analysis.

Recommended prior knowledge:

Training participants must have a background in electrical engineering.

Main features:

- Overview of PSS®MUST main applications
- FCITC calculations
- PSS®MUST input data setup
- PSS®MUST user interface
- Contingency analysis (AC and DC)
- Flowgate implementation in PSS®MUST
- Transaction impact analysis
- Sensitivity analysis
- Parallel transfer analysis
- Generation sensitivity analysis
- Transaction scheduling
- System impact studies
- Starting from EMS flows
- Batch mode and command line mode
- Applications



USA

Duration: 4.5 days
Code No.: 9CA4055-1VA00-OKA7
Language: English
Location: Schenectady
 Denver
Price: 2,700 USD

Dates:
 02.03. - 06.03.2009 (S)
 05.10. - 09.10.2009 (S)
 07.12. - 11.12.2009 (D)
 Schenectady (S)
 Denver (D)

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PSS®ODMS Fundamentals – Modeling and analysis

Training objectives:

This training will show you how to maintain the central data repository for operations and planning data using advanced modeling and analytical tools.

The training is intended for:

Training is designed for those with varied experience using PSS®ODMS who could benefit from a review of basic concepts as well an introduction to more advanced topics.

Main features:

- PSS®ODMS – Model maintenance
 - Overview of PSS®ODMS
 - Model activities
 - Using one-line diagram editor
 - Using Network Topology Editor (NTE)
 - Navigating between one-line and NTE
 - Model history features
 - Model merge
- PSS®ODMS – System operation (Study analysis)
 - PSS® Case management
 - Spreadsheet views
 - Modes
 - Activities, options and display settings
 - ASC scripting



USA

Duration: 1 day
Code No.: 9CA4055-1VA00-OKA6
Language: English
Location: Houston
 Schenectady
Price: 1,200 USD

Dates:
 02.03.2009 (H)
 09.11.2009 (S)
 Houston (H),
 Schenectady (S)

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PSS®SINCAL Basic

Training objectives:

The participants will acquire basic knowledge how to use the net-planning program PSS®SINCAL. They will learn to use the software for basic calculations on topics related to load flow and short circuit.

The training is intended for:

Engineers and service technicians from power supply utilities and industry in operation, planning and design of power systems.

Recommended prior knowledge:

Basic knowledge of electrical engineering, electrical networks and protection technology.

Main features:

- User interface (window technologies, indications, characteristics)
- Basic functions (create and edit network elements)
- Masks (functionality, manipulation of standardized types)
- Exposition of results (tables, protocols, graphics)
- Filters for demonstration
- Table editor (design, operation, prints)
- Establishing of networks (import, export of data)
- Graphic editor (formatting, evaluation, objects)
- Electrical elements and methods
- Macros, variants, catalogs
- Network planning toolbox
- Exercises how to apply PSS®SINCAL with some case studies



Germany, USA

Duration: 2 days
Code No.: 9CA4055-OVE00-OKA1 (N)
 9CA4055-1VA00-OKB3 (H)
Language: English
Location: Nuremberg
 Houston
Price: 1,260 EUR (N)
 1,650 USD (H)

Dates:
 10.11. - 11.11.2008 (N)
 16.02. - 17.02.2009 (H)
 09.03. - 10.03.2009 (N)
 Nuremberg (N)
 Houston (H)

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PSS®SINCAL Update

Training objectives:

The training refreshes the basic knowledge and the enhancements of the last 12 months are deepened.

The training is intended for:

Engineers and service technicians from power supply utilities and industry in operation, planning and design of power systems.

Recommended prior knowledge:

Basic knowledge of electrical engineering.
 Course "PSS®SINCAL Basic".

Main features:

- Changes of the user interface
- Discussion of program parameters and controls
- Introduction to netplanning tools
- Additional functionalities, e.g. generic data
- Evaluations and filters are deepened
- Introduction to new methods, e.g. load estimation
- Calculation of power systems by using groups, zones
- Exercises on different functionalities
- Discussion of specific user problems



Germany

Duration: 1 day
Code No.: 9CA4055-OVE00-OKA4
Language: English
Location: Nuremberg
Price: 620 EUR

Dates:
 13.11.2008
 12.03.2009

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PSS®SINCAL Protection

Training objectives:

The participants will acquire basic knowledge how to use the protective relaying modules of the netplanning tool PSS®SINCAL. They will learn to use the software for time overcurrent – as well as applications with distance protection.

The training is intended for:

Engineers and service technicians from power supply utilities and industry in operation, planning and design of power systems.

Recommended prior knowledge:

Course "PSS®SINCAL Basic".

Main features:

- Introduction to time overcurrent protection
- Protective relaying functionality in PSS®SINCAL
- Module time-overcurrent-protection
 - Collecting elements
 - Calculation of single faults or groups
 - Evaluation of reports
 - Generation of diagrams
- Introduction to distance protection
- Module DI – Calculation of gradings
 - Calculation of grading factors
 - Evaluation of the results in masks
 - Generation of selectivity diagrams
- Module SZ – Simulation of protection trips
 - Input of user-defined protection devices
 - Calculation of protection coordination
 - Evaluation of the results in diagrams
- Practical exercises on all modules



Duration: 1 day	Dates:
Code No.: 9CA4055-OVE00-OKA2 (N)	12.11.2008 (N)
9CA4055-1VA00-OKB4 (H)	05.02.2009 (H)
Language: English	11.03.2009 (N)
Location: Nuremberg	Nuremberg (N)
Houston	Houston (H)
Price: 630 EUR (N), 1,200 USD (H)	

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PSS®SINCAL Probabilistic reliability

Training objectives:

The participants will acquire basic knowledge how to use the netplanning program PSS®SINCAL with respect to reliability calculations. One main target of this training is the interpretation of the results.

The training is intended for:

Engineers and service technicians from power supply utilities and industry in operation, planning and design of power systems.

Main features:

- Introduction to reliability calculations
 - Probabilistic basics of reliability calculations
 - Modeling of networks, failure impact and restoration
 - Case studies and practical exercises
- Practical training on a medium-voltage-reference network
 - Collection of all necessary data as well as information about operation and restoration after failures
 - Enhancement of load flow data for a realistic replica of the operational conditions (section points, components out-of service)
 - Implementation of load model
 - Implementation of reliability group; selection of outage models, execution of calculations
 - Analysis and discussion of results; presentation of results



Duration: 5 days	Dates:
Code No.: 9CA4055-OVE00-OKA6 (N)	on request (N)
9CA4055-1VA00-OKB5 (H)	09.02. - 13.02.2009 (H)
Language: English	Nuremberg (N)
Location: Nuremberg	Houston (H)
Houston	
Price: 3,110 EUR (N)	
2,700 USD (H)	

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PSS®SINCAL Dynamics

Training objectives:

The participants will acquire basic knowledge how to use the netplanning program PSS®SINCAL for analysis of dynamic conditions. They will learn to use the software for basic calculations on topics related to stability, transients and Eigenvalues.

The training is intended for:

Engineers and service technicians from power supply utilities and industry in operation, planning, design of network and its components.

Recommended prior knowledge:

Basic knowledge of electrical engineering.
 Course "PSS®SINCAL Basic".

Main features:

- General overview of PSS®SINCAL
- Dynamic (modules and methods)
- Basics of the dynamic of electrical networks
- Basics of Eigenvalue and modal analysis
- User interface (indications, characteristics)
- Program controls (modes: RMS, EMT, Eigenvalues, plots, failures)
- Exposure of results (tables, protocols, graphics)
- Case studies (simulations for stability, transient phenomenas)
- Post-processing of results (evaluation, prints)
- Hands-on exercises how to apply PSS®SINCAL dynamic calculations



Duration: 3 days	Dates:
Code No.: 9CA4055-OVE00-OKA7 (N)	07.12. - 09.12.2009 (H)
9CA4055-1VA00-OKB6 (H)	09.02. - 11.02.2009 (N)
Language: English	15.04. - 17.04.2009 (H)
Location: Nuremberg	15.06. - 17.06.2009 (N)
Houston	23.09. - 25.09.2009 (H)
Price: 1,560 EUR (N)	Nuremberg (N)
2,365 USD (H)	Houston (H)

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PSS®NETOMAC Basic

Training objectives:

The participants will acquire basic knowledge how to use the netplanning program PSS®NETOMAC. They will learn to use the software for basic calculations on topics related to load flow, stability and transients.

The training is intended for:

Engineers and service technicians from power supply utilities and industry in operation, planning, design of network and its components.

Recommended prior knowledge:

Basic knowledge of electrical engineering.

Main features:

- General overview of PSS®NETOMAC (modules and methods)
- User interface (window technologies, indications, characteristics)
- Basic functions (create and edit network elements)
- Program controls (modes: RMS, EMT, plots, failures)
- Exposition of results (tables, protocols, graphics)
- Case studies (simulations for load flow, stability, transient phenomenas)
- Post-processing of results (evaluation, prints)
- Establishing networks (import, export of data)
- Electrical elements and methods
- Basics of controller systems using BOSL (Block-Oriented Simulation Language)
- Macros, variants
- Exercises how to apply PSS®NETOMAC with some case studies



Duration: 3 days	Dates:
Code No.: 9CA4055-OVE00-OKB1	17.11. - 19.11.2008
Language: English	06.04. - 08.04.2009
Location: Nuremberg	
Price: 1,560 EUR	

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PSS®NETOMAC Advanced

Training objectives:

The basic knowledge gained within PSS®NETOMAC Basic course will be deepened. In PSS®NETOMAC modelling of regulations and controls is done using BOSL (Block-Oriented Simulation Language), Eigenvalue and modal analysis.

The training is intended for:

Engineers and service technicians from power supply utilities and industry in operation, planning, design of network and its components.

Recommended prior knowledge:

Course "PSS®NETOMAC Basic".

Main features:

- Regulations and controls with BOSL (Block-Oriented Simulation Language) – deepening aspects
- Graphical engineering of controller systems
- Case studies and exercises (excitation systems, turbines, load flow models, FACTS)
- Exercises for Eigenvalue- and Modal Analysis (NEVA).



Germany

Duration: 2 days
Code No.: 9CA4055-0VE00-0KB2
Language: English
Location: Nuremberg
Price: 1,040 EUR

Dates:
 20.11. - 21.11.2008
 09.04. - 10.04.2009

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NEVA – Eigenvalue and modal analysis

Training objectives:

The participants will acquire basic knowledge about the theory of small-signal analysis and how to use the Eigenvalue and modal analysis module for all products of the PSS® product suite (PSS®NETOMAC, PSS®SINCAL, PSS®E). They will learn to use the software for analyzing of power systems and determining locations for power oscillation damping equipment. Each training day starts with lectures and continues with practical exercises.

The training is intended for:

Engineers and service technicians from power supply utilities and industry in operation, planning, design of network and its components.

Recommended prior knowledge:

Basics of electrical (power) engineering and control engineering. Course "PSS®SINCAL Basic course" and/or "PSS®NETOMAC Basic course" and/or "PSS®E Introduction to dynamic simulation".

Main features:

- Basics of Eigenvalue and modal analysis
- Exercises to NEVA application
- Locating weak points in power systems
- Placement of damping equipment (Stabilizer, FACTS, etc.)
- Launching NEVA from PSS® products
- Case studies and exercises



Germany, USA

Duration: 3 days
Code No.: 9CA4055-0VE00-0KB4 (N)
 9CA4055-1VA00-0KD2 (H)
Language: English
Location: Nuremberg
 Houston
Price: 2,355 EUR (N)
 2,365 USD (H)

Dates:
 15.12. - 17.12.2008 (N)
 25.05. - 27.05.2009 (N)
 on request (H)

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GMB – Graphical Model Builder

Training objectives:

The participants will acquire basic knowledge how to use the Graphical Model Builder module (GMB) for all products of the PSS® family (PSS®NETOMAC, PSS®SINCAL, PSS®E). During this course, the basic knowledge of the PSS® products' fundamental courses will be deepened and the trainee learns to build dynamic models – e.g. exciters, governors, power system stabilizers – using a Block-Oriented Simulation Language (BOSL) and the MS VISIO-based Graphical Model Builder (GMB). Each training day starts with lectures and continues with practical exercises.

The training is intended for:

Engineers and service technicians from power supply utilities and industry in operation, planning, design of network and its components.

Recommended prior knowledge:

Basic knowledge of electrical (power) engineering and control engineering.

Course "PSS®SINCAL Basic" and/or "PSS®NETOMAC Basic" and/or "PSS®E Introduction to dynamic simulation".

Main features:

- Graphical engineering of controller systems (Theory)
- Regulations and controls with BOSL (block-oriented simulation Language) MS VISIO and GMB (Graphical Model Builder)
- GMB Handling (basics, menus, elements)
- Stand-alone tests of designed models
- Using tested models in PSS® products
- Case studies and exercises (excitation systems, turbines, load flow models, FACTS)



Germany, USA

Duration: 3 days
Code No.: 9CA4055-0VE00-0KB3 (N)
 9CA4055-1VA00-0KD3 (H)
Language: English
Location: Nuremberg
 Houston
Price: 2,355 EUR (N)
 2,365 USD (H)

Dates:
 08.12. - 10.12.2008 (N)
 11.05. - 13.05.2009 (N)
 on request (H)

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Primary Equipment

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General information course high-voltage switching technology

Training objectives:

The participants will receive general knowledge of today's Siemens power circuit breakers and SF₆-insulated switchgear (GIS) design and design advantages, mode of operation and advantages for the operator.

The training is intended for:

Persons involved in planning, application engineering, coordination and purchasing etc., i.e. persons who need general knowledge of performance and operation of the circuit breakers or system components of SF₆-insulated switchgear, but who do not personally carry out any work on this equipment.

Recommended prior knowledge:

General knowledge of electrical engineering and mechanical engineering in addition to basic breaker and switchgear functions.

Main features:

- Individual modules of switchgear interaction of modules
- Basic mode of operation of the circuit breaker interrupter unit (puffer/self-compression) and the functions of the individual components
- Basic mode of operation of the drive systems and its components (hydraulic/spring mechanism)
- Control and monitoring of the switchgear
- Limit values and their backgrounds
- Environmental protection
- It is also scheduled that the participants become familiar with the production plants

General information course high-voltage switching technology for non-technical staff

Training objectives:

This course conciliates a basic knowledge of high-voltage switching technology (power circuit breakers and SF₆-insulated switchgear (GIS).

The training is intended for:

Siemens employees who would like to be informed about general knowledge of functionality and operation for the daily business.

Main features:

- The training conveys general knowledge about
 - General survey of high-voltage
 - Product spectrum high-voltage circuit breakers and their functionality
 - Product spectrum high-voltage gas-insulated switchgear and their functionality
 - Switching operations/arc
 - SF₆-gas quenching and insulating medium
 - Processes in the "Schaltwerk Berlin"
 - Familiarization with the production plants is also scheduled

Technical information course high-voltage switching technology – gas-insulated switchgear (GIS)

Training objectives:

This course covers high-voltage gas-insulated switchgear. It conciliates the most important technical knowledge required to enable participants, after completing the training, to describe possible faults on SF₆-insulated switchgear and to establish their causes.

The training is intended for:

Persons who should be familiar with design and construction of SF₆-insulated switchgear, e.g. operating and maintenance personnel, field service personnel and engineers.

Recommended prior knowledge:

Major knowledge of power engineering. Experience with switchgear technology would be advantageous.

Main features:

- Conveying detailed knowledge of the technology of specific switchgear types. The following points are discussed in particular:
- The individual modules of the switchgear
- Interaction of the individual modules
- Basic mode of operation of the circuit breaker interrupter unit
- The basic mode of operation of the drive system
- Control and monitoring of the switchgear
- The limit values and background
- The interlocking system
- Maintenance and servicing
- Environmental protection

Technical information course high-voltage switching technology – air-insulated circuit breaker (3A)

Training objectives:

This course conciliates specific knowledge about air-insulated circuit breaker, type 3A. This includes describing possible faults on SF₆-insulated switchgear and to establish their causes.

The training is intended for:

Persons who should be familiar with design and construction of power circuit breakers, e.g. operating and maintenance personnel, field service personnel and engineers.

Recommended prior knowledge:

Major knowledge of power engineering. Experience with switchgear technology would be advantageous.

Main features:

- Conveying detailed knowledge of the technology of specific circuit breakers. The following points are discussed in particular:
- The individual modules of the switchgear
- Interaction of the individual modules
- Basic mode of operation of the circuit breaker interrupter unit
- The basic mode of operation of the drive system
- Control and monitoring of the switchgear
- The limit values and background
- The interlocking system
- Maintenance and servicing
- Environmental protection



Germany

Duration: 5 days
Code No.: 9CA4010-ODE00-0AA1
Language: English
Location: Berlin
Price: 2,615 EUR

Dates: 09.02. - 13.02.2009

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Germany

Duration: 2 days
Code No.: 9CA4010-ODE00-0AA3
Language: English
Location: Berlin
Price: 1,045 EUR

Dates: 17.11. - 18.11.2008

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Germany

Duration: 5 days
Code No.: 9CA4010-0FE00-0AA1
Language: English
Location: Berlin
Price: 2,615 EUR

Dates: 26.01. - 30.01.2009
15.06. - 19.06.2009

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Germany

Duration: 5 days
Code No.: 9CA4010-ODE00-0AA2
Language: English
Location: Berlin
Price: 2,615 EUR

Dates: 15.06. - 19.06.2009

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Primary Equipment – Transmission Networks

Technical information course high-voltage switching technology – circuit breaker with hydraulic drive 3AQ/3AT

Training objectives:

The participants will receive technical information about high-voltage switching technology – circuit breaker with hydraulic drive, type 3AQ/3AT. They will be able to describe possible faults and to establish their causes.

The training is intended for:

Persons who should be familiar with design and construction of power circuit-breakers, e.g. operating and maintenance personnel, field service personnel and engineers.

Recommended prior knowledge:

Major knowledge of power engineering. Experience with switchgear technology would be advantageous.

Main features:

- Conveying detailed knowledge of the technology of specific circuit breakers and switchgear types. The following points are discussed in particular:
- The individual modules of the switchgear
- Interaction of the individual modules
- Basic mode of operation of the circuit breaker interrupter unit
- The basic mode of operation of the drive system
- Control and monitoring of the switchgear
- The limit values and background
- The interlocking system
- Maintenance and servicing
- Environmental protection

Technical information course high-voltage switching technology – circuit breaker with spring drive mechanism (3AP)

Training objectives:

The participants will receive technical information about high-voltage switching technology – circuit breaker with spring drive mechanism, type 3AP. They will be able to describe possible faults and to establish their causes.

The training is intended for:

Persons who should be familiar with design and construction of power circuit-breakers, e.g. operating and maintenance personnel, field service personnel and engineers.

Recommended prior knowledge:

Major knowledge of power engineering. Experience with switchgear technology would be advantageous.

Main features:

- Conveying detailed knowledge of the technology of specific circuit breakers and switchgear types. The following points are discussed in particular:
- The individual modules of the switchgear
- Interaction of the individual modules
- Basic mode of operation of the circuit breaker interrupter unit
- The basic mode of operation of the drive system
- Control and monitoring of the switchgear
- The limit values and background
- The interlocking system
- Maintenance and servicing
- Environmental protection

Technical information course high-voltage switchgear type 8DP3 GIS

Training objectives:

The participants will receive technical information about high-voltage switchgear, type 8DP3 GIS. They will be able to describe possible faults on SF₆-insulated switchgear and to establish their causes.

The training is intended for:

Persons who should be familiar with design and construction of SF₆-insulated switchgear, e.g. operating and maintenance personnel, field service personnel and engineers.

Recommended prior knowledge:

Major knowledge of power engineering. Experience with switchgear technology would be advantageous.

Main features:

- Conveying detailed knowledge of the technology of specific switchgear types. The following points are discussed in particular:
- The individual modules of the switchgear
- Interaction of the individual modules
- Basic mode of operation of the circuit breaker interrupter unit
- The basic mode of operation of the drive system
- Control and monitoring of the switchgear
- The limit values and background
- The interlocking system
- Maintenance and servicing
- Environmental protection
- Sulphur Hexa Fluoride (SF₆)

Technical information course high-voltage switchgear type 8DN9-1 GIS

Training objectives:

The participants will receive technical information about high-voltage switchgear, type 8DN9-1 GIS. They will be able to describe possible faults on SF₆-insulated switchgear and to establish their causes.

The training is intended for:

Persons who should be familiar with design and construction of SF₆-insulated switchgear, e.g. operating and maintenance personnel, field service personnel and engineers.

Recommended prior knowledge:

Major knowledge of power engineering. Experience with switchgear technology would be advantageous.

Main features:

- Conveying detailed knowledge of the technology of specific switchgear types. The following points are discussed in particular:
- The individual modules of the switchgear
- Interaction of the individual modules
- Basic mode of operation of the circuit breaker interrupter unit
- The basic mode of operation of the drive system
- Control and monitoring of the switchgear
- The limit values and background
- The interlocking system
- Maintenance and servicing
- Environmental protection Sulphur Hexa Fluoride (SF₆)
- Environmental protection
- Sulphur Hexa Fluoride (SF₆)



Germany

Duration: 3 days
Code No.: 9CA4010-0DE00-0AA4
Language: English
Location: Berlin
Price: 1,565 EUR

Dates:
on request

Contact:
Helene Jenewein
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Fax: +49 911 433-7929
E-mail:
helene.jenewein@siemens.com



Germany

Duration: 3 days
Code No.: 9CA4010-0DE00-0AA5
Language: English
Location: Berlin
Price: 1,565 EUR

Dates:
on request

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Fax: +49 911 433-7929
E-mail:
helene.jenewein@siemens.com



Germany

Duration: 5 days
Code No.: 9CA4010-0FE00-0AA2
Language: English
Location: Berlin
Price: 2,615 EUR

Dates:
on request

Contact:
Helene Jenewein
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Fax: +49 911 433-7929
E-mail:
helene.jenewein@siemens.com



Germany

Duration: 5 days
Code No.: 9CA4010-0FE00-0AA3
Language: English
Location: Berlin
Price: 2,615 EUR

Dates:
on request

Contact:
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helene.jenewein@siemens.com

Primary Equipment – Transmission Networks

Technical information course high-voltage switchgear type 8DN8-4 or 8DN8-2

Training objectives:

The participants will understand the technology of the 8DN8 GIS, to ensure its operating and its maintenance in safety conditions.

The training is intended for:

Maintenance agents, technical staff, HV engineers.

Recommended prior knowledge:

Basic knowledge of electrical engineering.

Main features:

- Generalities of GIS technology: story, technological choices, main characteristics
- SF₆ gas
- Design and functioning of GIS components
- Quality organization
- Maintenance program
- Practice works SF₆ gas refilling of a compartment
- Spare parts
- GIS operation
- Electrical diagram

Technical information course high-voltage switchgear type YG 420/550 kV GIS

Training objectives:

The participants will get a thorough understanding of YG 420/550 kV gas-insulated switchgear.

The training is intended for:

Utility engineers, technicians and operation/maintenance staff who will work with YG GIS installations who need to understand all elements of the switchgear making up a complete system.

Recommended prior knowledge:

Basic knowledge and experience of switchgear.

Main features:

- Items covered in presentations and practical workshop training include design principles, type testing, detailed operational methodology, maintenance, diagnostics and troubleshooting.
- Modules of the training cover functional elements of
 - Basic philosophy and design principles
 - Testing
 - Busbar systems and connections
 - Insulating components
 - Pressure vessels and safety devices
 - Bellows
 - Disconnectors
 - Maintenance and fault-making earth switches
 - Maintenance and diagnostics
 - Introduction to condition monitoring
 - SF₆ gassing requirements

Note:

The course is a combination of lectures and hands-on practical training.

Technical information course high-voltage switchgear type SPD2 420/550 kV circuit breaker

Training objectives:

The participants will get a thorough understanding of SPD2 420/550 kV SF₆ circuit breaker.

The training is intended for:

Utility engineers, technicians and operation/maintenance staff who will work with SPD2 circuit breakers.

Recommended prior knowledge:

Basic knowledge and experience of circuit breakers.

Main features:

- Items covered in presentations and practical workshop training include design principles, type testing, detailed operational methodology, maintenance, diagnostics and trouble shooting.
- Modules of the training cover functional elements of
 - Basic philosophy and design principles
 - Testing
 - Interrupter design
 - Hydraulic mechanism
 - Ancillary equipment
 - Maintenance and diagnostics
 - Purging of hydraulic systems
 - Timing checks
 - Introduction to condition monitoring
 - SF₆ gassing requirements

Note:

The course is a combination of lectures and hands-on practical training.

Technical information course high-voltage switchgear type SPL2 420/550 kV AIS circuit breaker

Training objectives:

The participants will get a thorough understanding of SPL2 420/550 kV SF₆ circuit breaker.

The training is intended for:

Utility engineers, technicians and operation/maintenance staff who will work with SPL2 circuit breakers.

Recommended prior knowledge:

Basic knowledge and experience of circuit breakers.

Main features:

- Items covered in presentations and practical workshop training include design principles, type testing, detailed operational methodology, maintenance, diagnostics and troubleshooting.
- Modules of the training cover functional elements of
 - Basic philosophy and design principles
 - Testing
 - Interrupter design
 - Hydraulic mechanism
 - Ancillary equipment
 - Maintenance and diagnostics
 - Purging of hydraulic systems
 - Timing checks
 - Introduction to condition monitoring
 - SF₆ gassing requirements

Note:

The course is a combination of lectures and hands-on practical training.



France

Duration: 5 days
Code No.: 9CA4010-4DE00-0AA1 (English)
9CA4010-4DF00-0AA1 (French)
Language: English, French
Location: Grenoble
Price: 2,615 EUR

Dates:
on request

Contact:
Helene Jenewein
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Fax: +49 911 433-7929
E-mail: helene.jenewein@siemens.com



United Kingdom

Duration: 5 days
Code No.: 9CA4010-2FE00-0AA3
Language: English
Location: Hebburn
Price: 2,000 GBP

Dates:
on request

Contact:
Phil Letouze
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Fax: +44 191 495-3693
E-mail: phil.letouze@siemens.com



United Kingdom

Duration: 3 days
Code No.: 9CA4010-2FE00-0AA5
Language: English
Location: Hebburn
Price: 1,300 GBP

Dates:
on request

Contact:
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Fax: +44 191 495-3693
E-mail: phil.letouze@siemens.com



United Kingdom

Duration: 2 days
Code No.: 9CA4010-2FE00-0AA7
Language: English
Location: Hebburn
Price: 800 GBP

Dates:
on request

Contact:
Phil Letouze
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Fax: +44 191 495-3693
E-mail: phil.letouze@siemens.com

Basic course in high-voltage switchgear design

Training objectives:

The participants will get a basic understanding of all aspects of switchgear design by covering fundamental aspects as a basis for further detailed study in any specific topic associated with substation design.

The training is intended for:

People who are relatively new to the Industry and are qualified to Incorporated Engineer level giving a foundation for the future or for those such as commissioning engineers.

Recommended prior knowledge:

Engineering qualification or experience in HV industry.

Main features:

- The training is divided into a number of modules, each module being of approximately one to two hours
- Basic switchgear types
- Arc interruption, operational duties and fault current
- SF₆ circuit breakers 72.5, 145, 300 and 420 kV
- Mechanism types and operation
- Interrupter operation
- Gas requirements
- Commissioning requirements and techniques
- Operational testing
- Future developments

Basic course in high-voltage substation design

Training objectives:

The participants will get a basic understanding of all aspects of substation design by covering fundamental aspects as a basis for further detailed study in any specific topic associated with substation design.

The training is intended for:

People who are relatively new to the industry and are qualified to Incorporated Engineer level giving a foundation for the future or for those with more limited engineering qualifications who would benefit from a more detailed understanding of substation design.

Recommended prior knowledge:

Engineering qualification or experience in HV industry.

Main features:

- The training is divided into eight modules, each module being of approximately two hours duration
- Basic elements of a power system
- Basic requirements of a substation
- Substation layout and busbar system design
- Main equipment and earthing
- Civil works and structures
- GIS substations
- Other equipment
- Protection and control

Note:

Highly interactive course – minimum 10 delegates, maximum 15 delegates!

HV circuit breaker testing

Training objectives:

This course enables the participants to deal with all aspects needed for HV circuit breaker testing.

The training is intended for:

Installation/commissioning personnel who will be responsible for circuit breaker testing and commissioning.

Prerequisites:

Basic knowledge and experience of switchgear and site working.

Main features:

The training covers as follows:

- Health safety and environmental requirements for testing/commissioning
- Relevant standards
- Circuit breaker types
- Mechanism types and design features
- Interrupter types and design features
- Resistance measurement
- Installation practice
- Commissioning and testing requirements
- Testing and equipment
- Interpretation of test results
- Schematic diagrams and documentation
- SF₆ and handling requirements

Note:

Lecture- and practical-based

Introduction to the high-voltage world

Training objectives:

The participants will discover the different parts of HV equipment and networks, will understand the stakes of the right choices and operating constraints.

The training is intended for:

Employees who require a general knowledge of HV equipment and networks.

Recommended prior knowledge:

General knowledge of electrical and mechanical engineering in addition to basic breaker and switchgear functions.

Main features:

- Origin and HV field
- Network and distribution basics
- Insulation
- Rules and basic functioning of the equipment:
 - Open-air circuit breaker and gas-insulated switchgear technologies
 - Current and voltage transformers
 - Disconnecting switches
- The different standard single-line diagrams
- Equipment evolutions
- Concept of maintenance
- Operating constraints
- Introduction to interlocking logic
- Recycling of obsolete equipment



United Kingdom

Duration: 3 days
Code No.: 9CA4010-2FE00-0AA8
Language: English
Location: Training location is flexible
Price: 1,050 GBP

Dates:
on request

Contact:
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 E-mail:
 phil.letouze@siemens.com



United Kingdom

Duration: 2 days
Code No.: 9CA4010-2FE00-0AB1
Language: English
Location: Hebburn
Price: 460 GBP

Dates:
on request

Contact:
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 Fax: +44 191 495-3693
 E-mail:
 phil.letouze@siemens.com



United Kingdom

Duration: 5 days
Code No.: 9CA4010-2FE00-0AB2
Language: English
Location: Hebburn
Price: 2,000 GBP

Dates:
on request

Contact:
 Phil Letouze
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 Fax: +44 191 495-3693
 E-mail:
 phil.letouze@siemens.com



France

Duration: 5 days
Code No.: 9CA4010-4DE00-0AA2 (English)
 9CA4010-4DF00-0AA2 (French)
Language: English, French
Location: Grenoble
Price: 2,615 EUR

Dates:
on request

Contact:
 Helene Jenewein
 Phone: +49 911 433-7533
 Fax: +49 911 433-7929
 E-mail:
 helene.jenewein@siemens.com

Become a specialist in high-voltage substation maintenance

Training objectives:

The participants will extend their knowledge for GIS and AIS maintenance, including organization, tasks, planning and tools. The trainees will be able to update their maintenance policy and to organize their HV substations maintenance.

The training is intended for:

Maintenance agents, technical agents, high-voltage engineers or employees in charge of a maintenance team.

Main features:

- Revision of GIS and AIS technologies
- Maintenance concepts and levels
- Detailed study of scheduled maintenance:
 - Inspection
 - Diagnostic test (moisture, pressure, speed measurement, density switch control...)
 - Examination
 - Overhaul
 - Periodic operations
- List of tools of scheduled maintenance
- Necessary tools, special tools, spare parts
- Data recording

Note:

Exact duration of the course is depending on previous knowledge respectively experience of the trainee and have to be defined individually.



France

Duration: 2 or 3 weeks (to define)
Code No.: 9CA4010-4DE00-0AA3 (English)
 9CA4010-4DF00-0AA3 (French)

Dates:
 on request

Language: English, French

Location: Grenoble

Price: on request

Contact:

Helene Jenewein
 Phone: +49 911 433-7533
 Fax: +49 911 433-7929
 E-mail: helene.jenewein@siemens.com

Overhauling and upgrading of your AIS Merlin Gerin circuit breaker

Training objectives:

The participants will be qualified to overhaul Merlin Gerin circuit breakers (FA type).

The training is intended for:

Maintenance agents, technical agents or HV-skilled workmen.

Main features:

- The air-insulated switchgear technology
- FA range
- SF₆ gas:
 - Generalities, properties, safety, the SF₆ pressure switch, gas compartments of FA, topping up, emptying and treatment of the circuit breaker
- Tightness and moisture:
 - Generalities and testing equipment
- Presentation of the FA breaker:
 - Arc interrupting chamber, support, drive mechanism
- Preparation of overhauling:
 - Examination of the instruction manual, how to use the documentation stocklist of the tools the control sheet
- Practical work:
 - SF₆ treatment: how to use a recovery machine, a vacuum pump moisture, measurement and tightness
- Practical work on FA circuit breaker:
 - Site organization
 - Tool inventory
 - Dismantling, cleaning, components checking
 - How to use follow-up files
 - Overhauling
 - Assembly of the circuit breaker

Note:

Exact duration of the course is depending on previous knowledge respectively experience of the trainee and have to be defined individually.



France

Duration: 2 or 3 weeks (to define)
Code No.: 9CA4010-4DE00-0AA4 (English)
 9CA4010-4DF00-0AA4 (French))

Dates:
 on request

Language: English, French

Location: Grenoble

Price: on request

Contact:

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 Fax: +49 911 433-7929
 E-mail: helene.jenewein@siemens.com

Knowledge, operation and maintenance of your air-insulated switchgear

Training objectives:

The participants will understand the VATECH (Merlin Gerin brand) AIS technology FA1, FA2, FA4 / GFA1, GFA2 / SB6-72, SB6-245 / PFA1, PIC, to ensure its operation and maintenance in safe conditions.

The training is intended for:

Maintenance agents, technical staff, high voltage engineers, network dispatching staff, employees who are working on a substation project.

Recommended prior knowledge:

Basic knowledge of electrical engineering.

Main features:

- General presentation of the AIS technology
- Functions of AIS components
- SF₆ gas:
 - Properties, pressures, density switch, tightness, moisture, circuit breaker gas treatment, safety and environment
- Design and functioning of the components:
 - Circuit breaker and its driving mechanism, earthing switches, disconnecting switches, voltage and current transformers
- Quality organization:
 - Routine tests in factory and on site
- Maintenance program:
 - Periodic maintenance, control, test, diagnosis, special tools
- AIS operation:
 - Manual and emergency operations, interlocking logic
- Electrical diagrams
- Spare parts
- Practice (adapted to your needs):
 - Topping up a CB pole, density switch test, maintenance procedure on the CB driving mechanism, periodic maintenance schedule tasks, dew point measurement and tightness



France

Duration: 4 days
Code No.: 9CA4010-4FE00-0AA6 (English)
 9CA4010-4FF00-0AA6 (French)

Dates:
 on request

Language: English, French

Location: Grenoble

Price: 2,080 EUR

Contact:

Helene Jenewein
 Phone: +49 911 433-7533
 Fax: +49 911 433-7929
 E-mail: helene.jenewein@siemens.com

Knowledge, operation and maintenance of your gas-insulated switchgear

Training objectives:

To understand the VATECH (Merlin Gerin brand) GIS technology H7, H9, H10, H9S / TH7, TH7m, TH7h / HB7, HB9, HB10, to ensure its operation and maintenance in safe conditions.

The training is intended for:

Maintenance agents, technical staff, high voltage engineers, network dispatching staff, employees who are working on a substation project.

Recommended prior knowledge:

Basic knowledge of electrical engineering.

Main features:

- General presentation of the GIS technology
- Single-line diagrams and layout of the project
- SF₆ gas:
 - Properties, pressures, density switch, partitioning, tightness, moisture
 - compartment gas treatment, safety and environment
- Design and functioning of the components:
 - Circuit breaker / drive mechanism, earthing and disconnecting switches
 - busbar, insulators, connectors, voltage and current transformers
- Quality organization:
 - Routine tests in factory and on site
- Maintenance program:
 - Purpose, periodic maintenance, control, test, diagnosis, planning
- GIS operation:
 - Manual and emergency operations, interlocking logic
- Electrical diagrams
- Spare parts
- Practice (adapted to your needs):
 - Topping up a compartment, density switch test
 - Maintenance procedure, dew point measurement and tightness



France

Duration: 4 days
Code No.: 9CA4010-4FE00-0AA7 (English)
 9CA4010-4FF00-0AA7 (French)

Dates:
 on request

Language: English, French

Location: Grenoble

Price: 2,080 EUR

Contact:

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 Fax: +49 911 433-7929
 E-mail: helene.jenewein@siemens.com

Technical information course medium-voltage switchgear

Training objectives:

The participant will get information about air-insulated and gas-insulated medium-voltage circuit breaker switchgear and medium-voltage ring-main units. It conciliates the most important technical knowledge concerning construction, operation and maintenance. Additionally, a safe handling of the insulating medium SF₆ will be pointed out.

The training is intended for:

Operation and service personnel, installation and commissioning personnel, interested parties from sales and project processing.

Recommended prior knowledge:

Knowledge of medium-voltage technology.

Main features:

- System philosophy
- Construction of products
- Operating sequences
- Commissioning and maintenance
- Locating and rectifying of faults
- Safety regulations
- Elaboration of knowledge through practical exercises on cubicles
- SF₆ in the medium-voltage switchgear

Note:

The training program can also be tailored to special customer needs if requested.



Germany

Duration: 3 days
Code No.: 9CA4015-OCE00-0AA3
Language: English
Location: Frankfurt/Main
Price: 1,565 EUR

Dates: 03.03. - 05.03.2009

Contact:
 Gabriele Gundacker
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 Fax: +49 911 433-7929
 E-mail: gabriele.gundacker@siemens.com

Switching devices and switchgear – Basics and application

Training objectives:

The participants will be familiarized with functions and selection criteria of medium-voltage devices. Medium-voltage switchgear familiarization with standards, types and planning criteria.

The training is intended for:

Technical staff involved in sales and project planning, for power distribution systems up to 36 kV.

Recommended prior knowledge:

Basic technical knowledge.

Main features:

- Medium-voltage switching devices:
 - Design function, fundamental characteristics
 - Selection criteria
 - Switching duties
- Medium-voltage switchgear installations:
 - Planning of switchgear
 - Busbar systems
 - Building specifications
 - Personnel safety
 - Switchgear types
 - Circuit breaker switchgear
 - Load-break switchgear
 - Voltage detecting systems
 - Handling of SF₆ gas
 - Connection and termination systems
 - Safety accessories

Visit to Siemens Schaltanlagenwerk Frankfurt/Main. Along with the theoretical part, the training program also includes a tour of the Frankfurt manufacturing plant. This enables the participants to gain an insight into the production process and allows them to perform practical exercises on the switchgear.



Germany

Duration: 3 days
Code No.: 9CA4015-ONE00-0AA1
Language: English
Location: Nuremberg / Frankfurt/Main
Price: 1,565 EUR

Dates: on request

Contact:
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 Fax: +49 911 433-7929
 E-mail: gabriele.gundacker@siemens.com

Process-oriented engineering of power supply systems

Training objectives:

This course conciliates a basic knowledge of power systems and systems engineering enabling participants to work out reliable and cost-effective solutions to problems that are encountered in industrial processes.

The training is intended for:

Engineers and technicians who work in industry and have to solve integrated network and systems engineering problems within the context of new business development activities, planning, preparation of quotations, and processing.

Recommended prior knowledge:

Basic knowledge about medium-voltage systems.

Main features:

- Peculiarities of industrial power systems and their renewal process
- High-voltage switchgear
- Power transformers
- Medium-voltage circuit breaker switchgear and switchboard with load-break
- Digital protection and control

- Power distribution transformers
- Low-voltage equipment
- Switchgear and rail-based systems
- Standards and guidelines
- Project management for constructions
- EMC-compliant planning in low-voltage networks
- Optimum network configurations on the MV and LV sides of a power supply system coordinated to the centers of distribution
- Selection and dimensioning of equipment in power supply systems (switchgear, transformers, reactive power compensation, low-voltage distribution, etc.)
- Network protection concepts as a function of neutral-point connection
- Selection and dimensioning of current transformers to ensure protective selectivity
- Protection of transformers installed in decentralized locations with switch and fuse combinations
- Selection and dimensioning of a switch and fuse combination in line with VDE/IEC
- Practical examples/exercises with pocket calculator

Note:

A pocket calculator should be brought along!



Germany, USA

Duration: 4.5 days
Code No.: 9CA4015-ONE00-0AA7 (N)
 9CA4025-1TA00-0JB8 (S)
Language: English
Location: Nuremberg
 Schenectady
Price: 2,400 EUR (N), 2,700 USD (S)

Dates: on request (N)
 14.12. - 18.12.2009 (S)
 Nuremberg (N),
 Schenectady (S)

Contact:
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USA Siemens Power Academy
 Phone: 001 518 395-5005
 Fax: 001 518 346-2777
 E-mail: pti-edpro.ptd@siemens.com

Maintenance of switching devices and switchgear

Training objectives:

This maintenance course, which can be held at our training centers or locally in your installation, allows your service personnel to experience sound training specially tailored to your switchgear and devices.

The training is intended for:

Engineers, master craftsmen and technicians whose duties include maintenance of switchgear and associated systems.

Recommended prior knowledge:

Basic technical knowledge of the uses and operation of switchgear and associated systems.

Main features depending on the types of switchgear and devices involved:

- Reliable operation of your switching devices and switchgear
- Switching devices:
 - Rated quantities, typicals, structure, operator controls and operating mechanisms
 - General visual inspection of the circuit breaker
 - Mechanical and electrical function check
 - Checking the circuit breaker and operating mechanism
 - Checking all bolted connections and the contact system
 - Lubricating in accordance with operating instructions
 - Recognizing defective operating parts
- Switchgear:
 - Regular maintenance work in accordance with the manufacturer's specifications

Technical information course medium-voltage switchgear type LMT/LMVP

Training objectives:

The participants will get an overview of Reyrolle type LMT/LMVP metal clad switchgear.

The training is intended for:

Utility engineers, technicians and operation/maintenance staff who will work with Reyrolle LMT/LMVP switchgear.

Recommended prior knowledge:

Basic knowledge and experience of medium-voltage switchgear.

Main features:

- Items covered in presentations and practical workshop training include design principles, type testing, detailed operational methodology, maintenance, diagnostics and troubleshooting.
- Modules of the training cover functional elements of
 - Basic philosophy and design principles
 - Testing
 - Equipment design
 - Operational requirements
 - Maintenance and diagnostics
 - Introduction to condition monitoring

Note:

The course is a combination of lectures and hands-on practical training.

Technical information course medium-voltage switchgear type Hadrian

Training objectives:

The participants will get an overview of Reyrolle type Hadrian metal clad switchgear.

The training is intended for:

Utility engineers, technicians and operation/maintenance staff who will work with Reyrolle Hadrian switchgear.

Recommended prior knowledge:

Basic knowledge and experience of medium-voltage switchgear.

Main features:

- Items covered in presentations and practical workshop training include design principles, type testing, detailed operational methodology, maintenance, diagnostics and trouble shooting.
- Modules of the training cover functional elements of:
 - Basic philosophy and design principles
 - Testing
 - Equipment design
 - Operational requirements
 - Maintenance and diagnostics
 - Introduction to condition monitoring

Note:

Basic knowledge and experience of medium-voltage switchgear.

Technical information course on life extension for Reyrolle medium-voltage switchgear

Training objectives:

The participants will receive essential information for the assessment of options for repair, refurbish and replacement options for installed Reyrolle medium-voltage switchgear.

The training is intended for:

Utility engineers, technicians and operation/maintenance staff who will work or have asset management responsibilities for installed equipment of Reyrolle medium-voltage switchgear.

Recommended prior knowledge:

Basic knowledge and experience of medium-voltage switchgear.

Main features:

- A comprehensive training identifying the options and issues when determining whether to repair, refurbish or replace an existing installed base of Reyrolle medium-voltage switchgear.
- Training is divided into the following elements:
 - Installed base population and user requirements
 - Environmental and safety issues
 - Conventional maintenance and alternatives
 - Condition assessment techniques
 - Options for repair, refurbish and replacement
 - Product enhancement design options
 - Practical assessment of options

Note:

The course is a combination of lectures and workshop elements.



Germany

Duration: on request
Code No.: on request
Language: English
Location: on request
Price: on request

Contact:

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Dates: on request



United Kingdom

Duration: 1 day
Code No.: 9CA4015-2NE00-0AA1
Language: English
Location: Hebburn
Price: 400 GBP

Contact:

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Dates: on request



United Kingdom

Duration: 1 day
Code No.: 9CA4015-2NE00-0AA2
Language: English
Location: Hebburn
Price: 400 GBP

Contact:

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Dates: on request



United Kingdom

Duration: 2 days
Code No.: 9CA4015-2NE00-0AA3
Language: English
Location: Hebburn
Price: 800 GBP

Contact:

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Dates: on request

SP/SPS/SPS2 breaker maintenance training

Training objectives:

The participants will increase their knowledge in installation, operation and maintenance of Siemens type SP/SPS/SPS2-72.5 and SPS/SPS2-121/145/169 power circuit breakers.

The training is intended for:

This course is intended for personnel responsible for the installation, operation, and maintenance of Siemens power circuit breakers.

Recommended prior knowledge:

General maintenance of power circuit breakers.

Main features:

- Introduction to power circuit breakers
- Receiving and inspection
- Installation
- Periodic inspection
- 3-year inspection
- 6-year inspection
- Major inspection

BZO6/6C breaker maintenance training

Training objectives:

The participants will increase their knowledge in installation, operation and maintenance of Siemens type BZO6/6C power circuit breakers.

The training is intended for:

This course is intended for personnel responsible for the installation, operation, and maintenance of Siemens power circuit breakers.

Recommended prior knowledge:

General maintenance of power circuit breakers.

Main features:

- Introduction to circuit breakers
- Interrupter maintenance
- Power unit maintenance
- Ball valve / pilot valve maintenance
- Factory adjustment procedures
- Upgrades, life extension solutions
- Plan tour



USA

Duration: 2 days
Code No.: 9CA4070-1AA00-0EA1
Language: English
Location: Jackson
Price: 715 USD

Dates:
09.02. - 10.02.2009
04.05. - 05.05.2009
02.11. - 03.11.2009

Contact:

USA Siemens Power Academy
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USA

Duration: 2 days
Code No.: 9CA4070-1AA00-0EA2
Language: English
Location: Jackson
Price: 715 USD

Dates:
11.02. - 12.02.2009
05.05. - 06.05.2009
02.11. - 03.11.2009

Contact:

USA Siemens Power Academy
Phone: +1 518 395-5005
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pti-edpro.ptd@siemens.com

New standards for medium-voltage and high-voltage GIS impact on products and specifications

Training objectives:

This workshop allows the participants to discuss the major revisions of the basic standards for medium-voltage and high-voltage switchgear IEC 60298 and IEC 60517.

The training is intended for:

Operators of MV and HV switchgear in power supply companies and the industry developers and test bay engineers.

Main features:

- The revision of the standards has brought a new classification for the MV standard. This has an impact on the product construction and specification.
- The HV switchgear standard was harmonized with IEEE C37.122 and tailored to the present-day requirements and designs of HV GIS. There are different testing criteria, design specifications and commissioning that cause changes in the development and invitations to tender.



Germany

Duration: 1 day
Code No.: 9CA4010-ODE00-0AA6
Language: English
Location: Erlangen
Price: 520 EUR

Contact:

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SF₆ Basic course

Training objectives:

The participants will receive information about properties, environmental protection and safe use of SF₆. The training course complies with the conditions prescribed in Article 5 of EC Directive 842/2006.

The training is intended for:

Users and technical supporters of SF₆-gas-insulated switchgear and switching devices, personnel with technical interest from the purchasing, planning, sales, and project handling department, installation, commissioning and maintenance personnel.

Recommended prior knowledge

Familiarity with medium- and/or high-voltage technology.

Main features:

- Basics, properties and hazard potentials of SF₆
- SF₆ as extinguishing and insulating medium
- SF₆ and environmental protection
 - Kyoto-protocol
 - Voluntary commitment
 - EU F Gas Regulation (No. 842/2006)
- Use of SF₆ / SF₆ in the closed circuit (handling, recycling, storage, transport, documentation, Cigré Guide 276, IEC 60376, IEC 60480)
- Monitoring systems (pressure gauge and density monitor)
- Industrial safety and health regulations (BG 753, IEC 62271-303)
- Use of SF₆ decomposition products
- Operation, error detection and behavior in the event of a failure
- Basics of measuring methods (dew point, air content, decomposition products)



Germany

Duration: 1 day
Code No.: 9CA4050-OWE00-0DA1
Language: English
Location: Berlin
 Muelheim
Price: 640 EUR

Contact:

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 helene.jenewein@siemens.com

SF₆ User training

Training objectives:

Participants will be able to practice use of SF₆, measurements, measuring instruments, troubleshooting, environmental aspects.

The training is intended for:

Installation, commissioning and maintenance personnel.

Recommended prior knowledge:

Basic knowledge and experience of SF₆-filled equipment.

Main features:

- Basics of the operational reliability regulation
- Technical blend of air or nitrogen and SF₆
- Maintenance (measures and intervals)
- Practical use of SF₆
 - Evacuation and filling of gas compartments
 - Storage, recycling, disposal and documentation of SF₆ (CIGRE 278)
- Protective equipment for persons using the SF₆
- Practical measurements of dew point, air content and decomposition product
- „What to do in the case of pressure loss“: causes, locating and elimination of leakages
- Handling of SF₆ leak detectors and SF₆ service units
 - Design
 - Examples of state-of-the-art equipment
 - Practical use of the devices
- Relevant standards for switchgear and controlgear (IEC 62271) and SF₆ (IEC 60376, IEC 60480, IEC 61634)

Note:

Modules can be tailored to specific customer requirements.



Germany

Duration: 2 days
Code No.: 9CA4050-OWE00-0DA2
Language: English
Location: Berlin
 Muelheim
Price: 1,280 EUR

Contact:

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SF₆ Gas competence – operational course

Training objectives:

Participants will receive the operational training EUS accredited and includes the full requirements of those involved in the installation, operation and maintenance of SF₆-filled equipment.

The training is intended for:

Maintenance and installation/commissioning personnel or those who are directly involved with the handling of SF₆ gas.

Recommended prior knowledge:

Basic knowledge and experience of SF₆-filled equipment.

Main features:

The training covers as follows:

- SF₆ properties
- Environmental awareness
- Handling, control and storage
- Safety in terms of release of SF₆ both from storage and failed equipment
- Legal and reporting requirements
- Monitoring of SF₆ gas and appropriate recording of data related to national environmental obligations
- Gas handling operations including: evacuation, filling and “topping up” and leak detection
- Measurement techniques: quality, density, moisture, acidity
- Transport of clean and recycled SF₆ related to national environmental obligations
- Breakdown properties of SF₆
- Precautions and preparations for the opening of SF₆ filled electrical equipment
- Personal protection equipment
- SF₆ recovery
- Decontamination and waste management

Note:

Modules can be tailored to specific customer requirements.



United Kingdom

Duration: 2 days
Code No.: 9CA4040-2WE00-0DA1
Language: English
Location: Hebburn
Price: 920 GBP

Contact:

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 phil.letouze@siemens.com

SF₆ Gas awareness

Training objectives:

Participants will receive a basic level of SF₆ awareness as required for those personnel who have some involvement with SF₆-filled equipment, or operate in areas where SF₆ in containers or SF₆-filled equipment is present. The personnel are not directly involved in “gas handling” or operation of the equipment.

The training is intended for:

Engineers, technicians and managers who will benefit from a knowledge of SF₆ gas and safety, environmental and legal requirements that they or their staff will need to be aware of.

Main features:

The training covers as follows:

- SF₆ properties
- Environmental awareness
- Handling, control and storage
- Safety in terms of release of SF₆ both from storage and used equipment
- Legal and reporting requirements

Note:

The course is a combination of lectures and hands-on practical training.

UHF partial discharge monitoring for GIS substations

Training objectives:

The course will give a thorough understanding of the theory and application of Ultra High Frequency monitoring of GIS equipment and the operation of either portable or continuous monitoring systems.

The training is intended for:

Utility engineers with responsibilities for GIS substation design, operation or maintenance who will utilize or specify UHF monitoring systems.

Recommended prior knowledge:

Switchgear design and/or testing knowledge and understanding of GIS equipment.

Main features:

- Introduction to partial discharge measurements
- Basic types of partial discharge within GIS equipment
- Theory of UHF method
- Application of UHF method on GIS
- Diagnostic techniques and experts systems
- Application of UHF method in factory as routine test
- Site commissioning tests
- Periodic monitoring using portable equipment
- Continuous monitoring systems
- Hands-on use of equipment and systems

Substation condition monitoring system operation

Training objectives:

Participants will be trained in operation and application of Siemens substation monitoring systems.

The training is intended for:

Utility engineers with responsibilities for GIS substation design, operation or maintenance who will utilize or specify UHF monitoring systems.

Recommended prior knowledge:

Switchgear design and or testing knowledge and understanding of equipment application.

Main features:

Each module of the training details one element of the integrated substation monitoring system covering:

- Introduction to monitoring system and parameters selected
- Sensor and system design
- System application
- System operation
- Diagnostics and report generation
- Software and system upgrades

Condition monitoring elements covered are:

- UHF partial discharge
- Circuit breakers and switching equipment
- SF₆ gas inventory
- Transformers
- Balance of substation equipment



United Kingdom

Duration: 0.5 days
Code No.: 9CA4040-2WE00-ODA2
Language: English
Location: Hebburn
Price: 225 GBP

Dates:
on request

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 phil.letouze@siemens.com



United Kingdom

Duration: 2 days
Code No.: 9CA4050-2WE00-ODA3
Language: English
Location: Hebburn
Price: 900 GBP

Dates:
on request

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United Kingdom

Duration: 1 day
Code No.: 9CA4040-2WE00-ODA4
Language: English
Location: Hebburn
Price: 475 GBP

Dates:
on request

Contact:
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 phil.letouze@siemens.com

Technical information course for operating personnel – power transformers

Training objectives:

The course conciliates general and special knowledge required for the safe operation of power transformers, maintenance works and early fault detection.

The training is intended for:

Employees from power generation and supply utilities and industry who are involved in the operation and maintenance of power transformers.

Recommended prior knowledge:

Basic knowledge of electrical engineering.

Main features:

- Transport of transformers and inspection upon arrival at the client
- Assembly, inspections upon completion of assembly
- Transformer oil
 - Oil-filling specifications
 - Sampling and testing of oil samples
- Tap changers and off-circuit tap changer
- Monitoring devices
- Commissioning and operation
- Troubleshooting/maintenance and service works
- On-the-job demonstration at the Nuremberg transformer plant

Transformer life management

Training objectives:

Participants are provided with an overview of diverse diagnostics possibilities, monitoring systems and measures for prolonging the life of power transformers. Aging phenomena are described on the basis of chemical and physical principles and possibilities of intervening in the processes are discussed. The areas of use of existing maintenance processes are assessed in connection with the results of diagnosis.

The training is intended for:

Asset managers, maintenance managers and technicians of power generation and power supply subcontractors and the industry who decide about the use of value-maintaining measures.

Recommended prior knowledge:

Basic knowledge of power transformers.

Main features:

- Diagnostic possibilities
 - Oil analysis
 - Standard electrical measurements
 - In-depth electrical measurements
 - Determining humidity in the winding insulation
- Local maintenance processes:
 - Oil circulation vacuum process
 - Stationary drying process
 - LFH (low-frequency heating) process
 - Regenerating the oil filling, alternative to oil replacement
- SITRAM+ online monitoring
- Modernization possibilities
- Performance boosting



Germany

Duration: 3 days
Code No.: 9CA4035-OLE00-OAA1
Language: English
Location: Nuremberg
Price: 1,310 EUR

Dates:
10.11. - 12.11.2008
06.07. - 08.07.2009

Contact:
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Germany

Duration: 1 day
Code No.: 9CA4035-OLE00-OAA4
Language: English
Location: Nuremberg
Price: 435 EUR

Dates:
on request

Contact:
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Network integration of wind power

Training objectives:

The participants will receive basic knowledge of power systems and systems engineering and will work out reliable and cost-effective solutions as required for the planning and design of wind power plants.

The training is intended for:

Engineers and technicians who work for power supply companies and industry and who have to solve integrated network and systems engineering problems within the context of new business development activities, planning, preparation of quotations, and processing in connection with the use of wind farms

Main features:

- Wind power plants in Germany and Europe
- General political conditions
- Characteristics of diverse types of wind generators
- Setting up a wind farm distribution (onshore and offshore)
- Linking wind farms to the power system (onshore and offshore) by means of AC or DC concepts
- Behavior of wind farms in the event of problems caused by the power system or by wind
- The German power infeed law (EEG) and the consequences for power system and power plant operation
- Requirements arising from the power grid code
- Consequences of concentrated wind farm locations at the North Sea and Baltic Sea for the regulated zone, the power utility and the end customer
- DENA Study
- Dynamic behavior of wind parks



Germany

Duration: 2 days
Code No.: 9CA4045-0EE00-0AA4
Language: English
Location: Erlangen
Price: 1,310 EUR

Dates:
on request

Contact:
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 carmen.davis.ext@siemens.com

Benefits of power electronics – understanding HVDC and FACTS

Training objectives:

The training participants will receive an understanding of power electronics in high-voltage and medium-voltage systems with a focus on HVDC and FACTS and their applications. Information on the technical features of different solutions, HVDC and FACTS system behavior, design of components, operation and maintenance requirements.

The training is intended for:

Engineers and managers in utilities, administration, transmission companies, power producers, consultants, design institutes and equipment manufacturers who are responsible for sales and marketing, consulting, planning and design of transmission projects, and all technically interested people in general.

Recommended prior knowledge:

Basic knowledge of electrical and power engineering.

Main features:

- Trends in power systems
- Understanding power transmission
- Power quality – terms and definitions
- Trends in AC and DC transmission
- Introduction in power electronic solutions
- HVDC and FACTS – basics and trends
- VSC technology for HVDC, FACTS and tractions supplies
- Power electronics for distributions and industrial systems
- Costs of high-voltage transmission
- Projects, studies and applications
- Outlook: PEBBs, GIS/HIS, GIL, H 2 and HTSC
- Training on computer and real-time simulator
- Blackouts 2003 – “Lessons Learned?”



Germany

Duration: 4 days
Code No.: 9CA4045-0EE00-0AA1
Language: English
Location: Erlangen
Price: 3,045 EUR

Dates:
on request

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Workshop on HVDC and FACTS

Training objectives:

The participants will receive and work out an understanding of power electronics in high-voltage and medium-voltage Systems with a focus on HVDC and FACTS and their applications. Information on the technical features of different solutions, HVDC and FACTS system behavior, design of components, operation and maintenance requirements.

The training is intended for:

Engineers and managers in utilities, administration, transmission companies, power producers, consultants, design institutes and equipment manufacturers who are responsible for sales and marketing, consulting, planning and design of transmission projects, and all technically interested people in general.

Recommended prior knowledge:

Basics of electrical engineering.

Main features:

- Trends in power systems
- Large blackouts 2003 – Review and “Lessons Learned?”
- Advanced technologies for bulk power transmission
- Embedding of large wind farms – challenges and risks
- Perspectives of new technologies
- Get to know HVDC and FACTS



Germany

Duration: 1 day
Code No.: 9CA4045-0EE00-0AA2
Language: English
Location: Erlangen
Price: 520 EUR

Dates:
on request

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Technical information course – benefits and features of MVDC/SIPLINK technology

Training objectives:

The course will create an understanding of MVDC (Medium-Voltage Direct Current) in back-to-back operation as flow control for distribution networks. Information on the technical features, system behavior, design, operation and maintenance requirements. This training covers all topics related to MVDC technology and gives an outlook on future developments and trends in power systems.

The training is intended for:

Engineers and management in utilities, administration, transmission companies, power producers, equipment manufacturers who are responsible for sales and marketing, consulting, planning and design of transmission projects, and all technically interested people in general.

Recommended prior knowledge:

Basic knowledge of electrical engineering.

Main features:

- Trends in power systems (industrial and utility networks)
- Limits of growing power systems and distribution solutions with MVDC technology
- Improvement of power quality with dynamic load flow control in systems with decentralized power generation
- Basics of MVDC/SIPLINK
- Projects and applications
- Training in the SIPLINK test field (Frankfurt/M.)
- Final discussion, conclusions



Germany

Duration: 2.5 days
Code No.: 9CA4045-0EE00-0AA5
Language: English
Location: Erlangen / Frankfurt/Main
Price: 1,975 EUR

Dates:
on request

Contact:
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Theory and practice of gas-insulated transmission line technology (GIL)

Training objectives:

The course conciliates theoretical basics of GIL technology and gives practical information by visit of the world's first GIL with gas mixture (N₂/SF₆).

The training is intended for:

Planner, asset manager in power systems, today's and future users, developer of transmission projects, people who are responsible for sales and marketing and all technically interested people in general.

Recommended prior knowledge:

Basic knowledge of electrical engineering.

Main features:

- GIL technology, design, testing, construction and commissioning
- Illustrating of advantages at transmission losses, life cycle, costs, environmental protection
- Examples and explanations of future implementation in power systems in conjunction with road tunnels, bridges or pipelines
- Valuation of costs for installation and operation
- Video about construction and run
- Life cycle considerations
- Visit of a GIL (tunnel in Geneva/Switzerland)



Switzerland

Duration: 1.5 days
Code No.: 9CA4045-0EE00-0AA7
Language: English
Location: Geneva
Price: 1,490 EUR

Dates:
on request

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Basics of communication networks and the application in power transmission and distribution

Training objectives:

The participants will receive basic knowledge of communication networks (LAN / WAN) and the application in power systems of transmission and distribution grids.

The training is intended for:

Engineers of utilities and industrial power supply and power generation, consultants and approving bodies as well as project leaders and design engineers.

Recommended prior knowledge:

Basics of digital and computer technology

Main features:

- OSI Reference model of communication
- Local networks
 - Structured cables (twisted Pair, optical fibers)
 - Ethernet
 - Components of the network (hubs, switches and router)
 - Virtual networks (VLAN) acc. to IEEE 802.1p and 802.1q
 - Redundancy concepts
- Overview WAN technologies
 - SDH, PDH, ISDN, Frame Relay, ATM, leased Line, dark Fiber, WDM
 - Interfaces (X.21, V.35, G.703)

TCP/IP

- Functioning of IP protocol
- Addressing of IP networks (class of network, subnetting)
- Functioning of UDP and TCP
- Overview of access security
 - VPN, Firewalls
- Quality of Service (QoS), package using networks for time-critical application
- Application / case studies



Germany

Duration: 2 days
Code No.: 9CA4085-0XE00-0GA3
Language: English
Location: Nuremberg
Price: 1,325 EUR
Date: 11.05. - 12.05.2009

Contact:
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Basics and trends of numerical communication in substations

Training objectives:

The participants receive a startup into communication inside substations based on serial data transfer as well as PROFIBUS and Ethernet. The basics of communication technology are being taught, nowadays and future norms will be introduced, as well as trends shown.

The training is intended for:

Engineers and technicians of power utilities and industries who deal with design, commissioning, maintenance and operation of numerical substation automation schemes.

Main features:

- Communication technology
 - ISO / OSI reference model
 - Protocols, profiles
 - Communication networks
- Ethernet
- IEC 60870-5-103
- IEC 60870-5-101, -104
- IEC 61850 "Communication Networks and Systems in Substations"
- Application of the above in switchgear



Germany

Duration: 2 days
Code No.: 9CA4085-0XE00-0GA1
Language: English
Location: Nuremberg
Price: 1,040 EUR
Dates: 11.12. - 12.12.2008
 14.09. - 15.09.2009

Contact:
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Basics, application and commissioning of IEC 61850 communication networks

Training objectives:

The participants will gain essential knowledge in substation communication based on IEC 61850. The basics of testing Ethernet compliant with IEC 61850 will be presented.

The training is intended for:

Engineers, technicians and consultants of power utilities and industries who deal with design, commissioning, maintenance and operation of communication systems compliant with IEC 61850.

Recommended prior knowledge:

Basic knowledge in communication technology and substation automation.

Main features:

- Introduction to IEC 61850 "Communication Networks and Systems in Substations"
- Design and services of the communication models (mappings, communication services)
- SCL – the standardized substation configuration description language
- Components of Ethernet-based communication networks
- Hardware and Ethernet configurations
- Settings, testing and diagnosis of the communication components
- Commissioning methods



Germany

Duration: 1.5 days
Code No.: 9CA4085-0XE00-0GA2
Language: English
Location: Nuremberg
Price: 1,040 EUR
Dates: 04.12. - 05.12.2008
 16.09. - 17.09.2009

Contact:
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 E-mail: isabell.siskov@siemens.com

Ruggedized communications for harsh environment

Training objectives:

Upon completion of this course, participants should be familiar with basic networking technology concepts and be able to apply these concepts on RuggedCom Ethernet switch products. Students will gain practical knowledge for real-world installations and basic Ethernet switch operation and maintenance.

The training is intended for:

Engineers and operations / maintenance technicians responsible for installing, commissioning and maintaining communications networks for power generation, transmission and distribution systems.

Recommended prior knowledge:

Participants need limited or no knowledge of networking and intend to become familiar with RuggedCom Ethernet switch.

Main features:

- Product and technology overview
- RuggedSwitch hardware and options
- Layer 2 networking
- Transmission media types and characteristics
- Switch administration
- Port configuration
- Spanning tree protocol
- Virtual LANs
- MAC address learning and administration
- Network time protocol
- Simple network management protocols
- Performing a software upgrade
- Diagnostics



Germany

Duration: 3 days
Code No.: 9CA4085-0XE00-0GA4
Language: English
Location: Nuremberg
Price: 3,310 EUR
Dates: 16.03. - 18.03.2009
 21.09. - 23.09.2009

Contact:
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 E-mail: isabell.siskov@siemens.com

IEC 61850 – the standard for substation automation – basics

Training objectives:

The participants learn about the structure of cooperation and communication between substation automation SAS units (e.g. bay control units, protective devices, switches, transformers, etc.). In addition to defining data transmission between SAS units, this standard also defines a multivendor object model for describing process data. So, IEC 61850 is more than purely a transmission protocol definition.

The training is intended for:

Employees from the power utilities and industry involved in the engineering, commissioning, maintenance or operation of communication systems and IEC 61850 in substation technology.

Recommended prior knowledge:

Basic knowledge of digital communication technology

Main features:

- This course provides an introduction to the new comprehensive standard. The technical background, objectives, methods of resolution as well as the applied methods of object-oriented process data modeling are presented and explained. The IEC 61850 standard consists of the following parts:
- General parts:
- Part 1: Introduction and overview
- Part 2: Glossary
- Part 3: General requirements
- Part 4: System and project management
- Part 5: Communication requirements for functions and device models
- Engineering part:
- Part 6: Substation automation configuration description language
- Modeling parts (object model for communication services):
- Part 7-1: Principles and models
- Part 7-2: Abstract communication service interface ACSI
- Part 7-3: Common data classes
- Part 7-4: Compatible logical node classes and data classes
- Specific communication service mapping SCSM for the communication between substation automation units:
- Part 8-1: Projection onto MMS (ISO / IEC 9506 parts 1 and 2 via ISO 8802-3)
- Specific communication service mapping SCSM for connecting primary equipment:
- Part 9-1: Serial unidirectional multidrop point-to-point link
- Part 9-2: for process bus
- Test-related part:
- Part 10: Conformity tests



Duration: 1 day
Code No.: 9CA4085-3XE00-GA5
Language: English
Location: Vienna
Price: 490 EUR

Dates:
23.03.2009
11.05.2009

Contact:

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power-academy.at@siemens.com

Network technology basics

Training objectives:

All modern automation systems are based on networks. Therefore it is all the more important for the process engineer to consolidate his / her basic knowledge in this field. The participants become familiar with state-of-the-art LAN network types and media, deal with protocol structures (TCP / IP), learn to understand terms like Ethernet, switching, IP routing and IP addressing. On top of that, the participants gain a basic understanding of typical topic areas in the field of network design. Such knowledge enables them to design simple networks by themselves and offers a sound basis for understanding more complex networks.

The training is intended for:

Employees from the power utilities and industry involved in the engineering, commissioning, maintenance or operation of communication systems in substation technology.

Recommended prior knowledge:

Basic knowledge of IT and communication

Main features:

- Types of networks
- Transmission technology and transmission media
- Protocol structures
- Basic knowledge of switching and routing
- TCP/IP – IP addressing
- Basics of design
- QoS overview
- Multicast overview



Duration: 3 days
Code No.: 9CA4085-3XE00-GA1
Language: English
Location: Vienna
Price: 1,470 EUR

Dates:
03.11. - 05.11.2008
30.03. - 01.04.2009

Contact:

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power-academy.at@siemens.com

Network technology in automation technology

Training objectives:

It is easy to get some network technology know-how – however... in this seminar the participants learn to understand the distinctive features of a network in an automation system and the specific requirements it has to fulfill. During the course the participants build up a typical network, which consists of automation units, a control system and an Industrial Layer2/3 Ethernet network.

The training is intended for:

Employees from the power utilities and industry involved in the engineering, commissioning, maintenance or operation of communication systems in substation technology.

Recommended prior knowledge:

Course "Network technology basics".

Main features:

- Requirements automation networks have to fulfil
 - Environment
 - Availability (redundancy)
 - Specific protocol standards (e.g. IEC 61850)
- Design of an automation network
 - Topology
 - Layer 2/3
 - Performance and bandwidth
 - Product choice
- Network management
- Practical application – automation network
 - Industrial network substation
 - Standard network central station
 - Network management
- Handling internal and external network operators
 - Service level (SLAs)
 - Interface choice (IP, SDH, etc.)
 - Security requirements



Duration: 2 days
Code No.: 9CA4085-3XE00-GA2
Language: English
Location: Vienna
Price: 980 EUR

Dates:
06.11. - 07.11.2008
02.04. - 03.04.2009

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IT security basics

Training objectives:

All modern automation systems are based on networks. The advantages are obvious: Cross-linked information is available any time and anywhere. Therefore it is particularly important to provide extensive protection for such systems. Our seminar deals with organizational and technical measures for the protection of such networks.

The training is intended for:

Employees from the power utilities and industry involved in the engineering, commissioning, maintenance or operation of communication systems in substation technology.

Recommended prior knowledge:

Course "Network technology basics"

Main features:

- What is the meaning of "Security"
- What are the potential hazards?
- Network and client security
- Separation of organizational / technical concepts
- Security policy
 - Developing a security guideline
- Available applications
 - Firewalls, OTP, monitoring, logging and reporting
- AAA services
- Available technologies
 - Virus protection, VPN (IPSec, SSL VPN), SSH, HTTPS

 Austria

Duration: 2 days
Code No.: 9CA4085-3XE00-GA3
Language: English
Location: Vienna
Price: 980 EUR

Dates:
10.11. - 11.11.2008
06.04. - 07.04.2009

Contact:
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IT security in automation technology

Training objectives:

In this seminar, the participants learn to work out security solutions which specifically focus on automation technology. During this course, the participants check the security measures of a typical automation network consisting of automation units, a control system, office PCs, etc., and also expand parts of the network.

The training is intended for:

Employees from the power utilities and industry involved in the engineering, commissioning, maintenance or operation of communication systems in substation technology.

Recommended prior knowledge:

Course "Network technology basics" and "IT security basics"

Main features:

- Concepts and approaches
 - Availability
 - Redundancy
 - Security perimeters (DMZ, etc.)
- Organizational measures
 - Security policy
- Technical measures
 - Implementation of technologies like firewalls, etc.
 - Device protection

 Austria

Duration: 2 days
Code No.: 9CA4085-3XE00-GA4
Language: English
Location: Vienna
Price: 980 EUR

Dates:
12.11. - 13.11.2008
08.04. - 09.04.2009

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power-academy.at@siemens.com

Basics for protection engineers

Training objectives:

Participants get information of the design, equipment and special events in electrical grids for the better understanding of requirements and functions of protecting devices.

The training is intended for:

Employees of energy providers and of the industry sector.

Recommended prior knowledge:

Basic knowledge of electrical engineering.

Main features:

- Grid
- Reference arrows
(generator reference-arrow system, motor reference-arrow system)
- Short circuit power
- Star point
- Grid faults
- Retroactive effects to the grid
- Overhead lines, cables
- Transformers, Petersen coils
- Circuit breakers
- Transformer (current, voltage)
- Fuses
- Switching gear
- Reactive-power compensation systems



Austria

Duration: 2 days
Code No.: 9CA4030-3HE00-0BF2
Language: English
Location: Vienna
Price: 1,040 EUR

Dates: 24.11. - 25.11.2008
 02.03. - 03.03.2009
 15.06. - 16.06.2009

Contact:

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Principles of system protection technology

Training objectives:

The participants familiarize themselves with the possible applications, mode of operation and general principles of the main system protection equipment.

The training is intended for:

Employees from power utilities and industry wishing to gain a basic knowledge of the planning, commissioning and maintenance of system protection equipment.

Recommended prior knowledge:

Basic knowledge of electrical engineering.

Main features:

- Overcurrent time protection
- Distance protection
- Line differential protection
- Busbar protection
- Transformer differential protection
- Motor protection



Germany, United Kingdom

Duration: 5 days (N), 3 days (H)
Code No.: 9CA4030-0HE00-0BA1 (N)
 9CA4030-0HE00-0BH1 (H)
Language: English
Location: Nuremberg, Hebburn
Price: 2,605 EUR (N), 1,650 GBP (H)

Dates: 09.02. - 13.02.2009 (N)
 10.03. - 12.03.2009 (H)
 07.09. - 11.09.2009 (N)

Location: Nuremberg (N)
 Hebburn (H)

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 E-mail: phil.letouze@siemens.com

Application of distance relaying

Training objectives:

The participant understands the principles of distance relaying and knows how to apply it in practice.

The training is intended for:

Employees in duty of planning and operation with basic knowledge of system protection.

Recommended prior knowledge:

Basic knowledge of protection technology.

Main features:

- Basics of distance relaying
- Digital distance relaying
- Estimation of reaction during load and fault conditions
- Permissible line loading, power swing blocking / tripping
- Requirements on current and voltage transformers
- Pilot distance relaying including digital relay-to-relay communication
- Automatic reclosing questions
- Fault location
- Application in transmission and distribution networks
- Relay coordination (zone-time grading charts)
- Calculation of set points
- Commissioning and maintenance
- Fault analysis
- Particular application cases (user guide and calculation examples):
 - Short lines
 - Long transmission lines
 - Parallel lines
 - Tee'd lines
 - Tapped lines
 - Transformer feeders
 - Series-compensated lines



Germany, United Kingdom

Duration: 3 days (N), 2 days (H)
Code No.: 9CA4030-0HE00-0BB5 (N)
 9CA4030-2HE00-0BA7 (H)
Language: English
Location: Nuremberg, Hebburn
Price: 1,565 EUR (N), 1,100 GBP (H)

Dates: 12.01. - 14.01.2009 (N)
 11.03. - 12.03.2009 (H)
 13.07. - 15.07.2009 (N)

Location: Nuremberg (N)
 Hebburn (H)

Contact:

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Application of differential relaying

Training objectives:

The participant understands the principles of differential relaying and knows how to apply it in practice.

The training is intended for:

Employees in duty of planning and operation with basic knowledge of system protection.

Recommended prior knowledge:

Basic knowledge of protection technology.

Main features:

- Basic principles and application variants of differential relaying
- Impact of current transformer transient behavior
- Characteristics of digital operating principles and application aspects
- CT specification and adaptation of settings
- Pilot wire differential relaying
 - Principles and application
 - Design and shielding of a pilot wire connection
 - Project examples using 7SD relays
- Pilot relaying with digital communication
 - Principles and application
 - Media for information transmission (wire, optic fiber, radio, data networks)
 - Basics and projecting of digital data transmission
 - Project examples using 7SD relays
- Transformer differential relaying
 - Principles and application
 - Two- and three-winding transformers, autotransformers, phase shifting transformers
 - Impact of turns ratio, vector group and neutral earthing
 - Stabilization against inrush and overfluxing
 - Restricted earth fault protection (earth differential protection)
 - Project examples using 7UT relays
- Busbar differential protection
 - Principles and application
 - Low-versus high-impedance principle
 - Advanced digital methods
 - Isolator replica
 - Breaker failure protection
 - Configuration and connection examples using 7SS relays



Germany

Duration: 3 days
Code No.: 9CA4030-0HE00-0BB6
Language: English
Location: Nuremberg
Price: 1,565 EUR

Dates: 15.12. - 17.12.2008
 20.07. - 22.07.2009

Contact:

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 E-mail: isabell.siskov@siemens.com

Application of differential relaying

Training objectives:

The participant understands the principles of differential relaying and knows how to apply it in practice.

The training is intended for:

Employees in duty of planning and operation with basic knowledge of system protection.

Recommended prior knowledge:

Basic knowledge of protection technology.

Main features:

- Basic principles and application variants of differential relaying
- Impact of current transformer transient behavior
- Characteristics of digital operating principles and application aspects
- CT specification and adaptation of settings
- Pilot wire differential relaying
 - Principles and application
 - Design and shielding of a pilot wire connection
 - Project examples using 7SD relays
- Differential relaying with digital communication
 - Principles and application
 - Media for information transmission (wire, optic fiber, radio, data networks)
 - Basics and projecting of digital data transmission
 - Project examples using 7SD relays
 - Brief description of associated settings and PC software DIGSI

Note:

The course will take the form of a PowerPoint presentation and practical demonstration of the SIPROTEC 7SD relay.



United Kingdom

Duration: 2 days
Code No.: 9CA4030-2HE00-0BA8
Language: English
Location: Hebburn
Price: 1,100 GBP

Dates: 21.04. - 22.04.2009

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 E-mail: phil.letouze@siemens.com

Overcurrent and bay control relays 7SJ61–7SJ64

Training objectives:

This course provides participants with an understanding of the use, application and installation of the SIPROTEC protection devices 7SJ61 / 7SJ62 and the bay control device 7SJ63 / 7SJ64.

The training is intended for:

Engineers working in the operations, testing and construction areas of power systems.

Recommended prior knowledge:

The course is based around the product and is recommended for engineers who will be involved with the use or application of the product. The training would be valuable to experienced engineers not familiar with the product and to engineers just entering the field of power system protection.

Main features:

- Purpose and functionality of the relay
- Model variants
- Relay build, features and operating characteristics
- Applications and setting guidelines for the relay
- Setting and configuration of the relay both from the relay fascia and from a PC using the data comms channel(s)
- Brief description of associated settings, configuration and interrogation software / PC interface DIGSI
- Communication options:
- Structure, use and performance spectrum of the communication protocols (mapping) in switchgear communication
- Structure of serial protocols for substation control and protection (protocol structure, data backups, etc.)
- Protocols
- IEC 60870-5-103 (VDEW protocol)
- IEC 60870-5-101/-104 (telecontrol protocol)
- IEC 61850 (new Ethernet-based protocol)



United Kingdom

Duration: 3 or 5 days
Code No.: 9CA4030-2HE00-0BA6
Language: English
Location: Hebburn
Price: 1,650 GBP

Dates: 13.05. - 15.05.2009

Contact:

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 E-mail: phil.letouze@siemens.com

- PROFIBUS DP
- PROFIBUS FMS (industrial and station automation protocols)
- MODBUS
- DNP 3.0 (protocols from the American sector)
- Fundamental principles of communication technology
 - Fiber-optic technology (fiber types, connectors, wavelength and calculating attenuation)
 - Serial communication components 7XV5 and how to use them with DIGSI 4
- Direct connection in protection systems
 - Interfaces and communication converters (G703.1 / G703.6 / X21, Cu, ISDN)
 - Direct connection in communication networks
- Communication via Ethernet and station bus
 - Basics of IEC 61850 Ethernet components
 - Parameterization tools, communication components
- Advice on test and commissioning aspects
- Related health and safety issues

Note:

The course will take the form of a PowerPoint presentation and practical demonstration of the SIPROTEC 7SJ relay.

Basic knowledge of system protection communication of power transmission and distribution networks

Training objectives:

Participants will become familiar with the basics of communication technology. They are given an overview of the various ways in which communication components and protocols can be used and are able to specify requirements for modern communications systems.

The training is intended for:

Employees of power supply companies and industry who deal with the planning, configuration, commissioning, maintenance and operation of numerical bay and station automation systems.

Recommended prior knowledge:

Basic knowledge of protection technology and substation control.

Main features:

- Structure, use and performance spectrum of the communication protocols (mapping) in switchgear communication
- Structure of serial protocols for substation control and protection (protocol structure, data backups, etc.)
- IEC 60870-5-103
- IEC 60870-5-101/-104 (telecontrol protocol)
- IEC 61850 PROFIBUS DP / FMS (industrial and station automation protocols)
- MODBUS, DNP 3.0 (protocols from the ANSI sector)
- Fundamental principles of communication technology
 - Fiber-optic technology (fiber types, connectors, wavelength and calculating attenuation)
 - Serial communication components 7XV5 and how to use with DIGSI 4
- Direct connection in protection systems
 - Interfaces and communication converters (G703.1 / G703.6 / X21, Cu, ISDN)
 - Direct connection in communication networks
 - Examples with differential protection
- Communication via Ethernet and station bus
 - Basics of IEC 61850 Ethernet components
 - Parameterization tools, communication components
- Presentation of some topics with SIPROTEC devices



Germany

Duration: 2 days
Code No.: 9CA4030-0HE00-0BD8
Language: English
Location: Nuremberg
Price: 1,040 EUR

Dates: 26.01. - 27.01.2009
 20.07. - 21.07.2009

Contact:

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 E-mail: isabell.siskov@siemens.com

Current and voltage transformers in theory and practice

Training objectives:

The participants will be getting a view into the physical and practical behavior of current and voltage transformers used in protection schemes. An essential aim of this course is the suitable cooperation of CTs and VTs with the protection device during power systems operation.

The participants will get insights into the dynamic behavior of CTs and will be familiarized with the specific measuring methods of CT characteristics by means of lab tests. Futuristic trends of CT technology will be presented, too.

The training is intended for:

Employees of power utilities and industry who are in charge of the design, commissioning and operation of power system protection schemes.

Recommended prior knowledge:

Basic knowledge of protection technology.

Main features:

- Physical behavior
- Standards
- Steady-state dimensioning criteria
- Transient behavior
- Interaction of CT / VT with protection device
- Dynamic behavior during operation
- Specific measuring methods
- Non-conventional instrument transformers

Design and settings of protection schemes for transmission grids – Part 1

Training objectives:

Participants will have an in-depth knowledge of the state-of-the-art protection of power transmission systems. They will know how to conceive complex protection schemes and be familiar with the special requirements for the protection of high- and extra-high-voltage systems.

The training is intended for:

Engineers of power supply utilities who deal with the planning, configuration, commissioning, maintenance and operation of numeric protection systems.

Recommended prior knowledge:

Course "Principles of numerical protection technology".

Main features:

- Special features of transmission systems and their requirements on protection
- Schemes of protection systems for high- and extra-high-voltage power systems
- Structure of dependability, security and redundancy considerations
- Impact of instrument transformer performance on protective relays
- Typical power system protection concepts for
 - Transmission lines
 - Power transformers
 - Busbars
 - 1½ circuit breaker configurations
- Protection coordination principles will applied to example systems and the appropriate programs will be used for training purposes

Design and settings of protection schemes for transmission grids – Part 2

Training objectives:

Participants will have an in-depth knowledge of complex protection systems and selective coordination of protective relays. They will know protection of switchgear equipment and calculation methods for selective settings of overall protection systems of cross-national transmission networks.

The training is intended for:

Engineers of power supply companies who deal with the planning, configuration, commissioning, maintenance and operation of numeric protection systems.

Recommended prior knowledge:

Course "Principles of numerical protection technology".

Main features:

- Influence of series-compensated lines and subsynchronous vibrations on protection relays
- Impact of power system instabilities on the relay performance
- Wide-area protection
- Smart maintenance strategies
- Protection coordination principles will be applied to example systems and the appropriate programs will be used for training purposes
- Specialities of cross-national transmission networks

Design and settings of protection schemes for distribution grids

Training objectives:

The participants will have an in-depth knowledge of protection of public distribution networks. They will know the special requirements for the protection of medium-voltage distribution networks.

The training is intended for:

Employees from power utilities, electrical distribution companies and industry responsible for the planning and operation of power system protection.

Recommended prior knowledge:

Basic knowledge of protection technology.

Main features:

- Relay-relevant performance of public distribution power systems
- Structure of protection schemes for public distribution systems
- Ground fault protection and troubleshooting
- Protection of LV and MV distribution systems
 - Overhead line
 - Cable
 - Transformer
 - Busbar protection
- Protection of systems with dispersed generation and system perturbation
- Protection coordination principles will be applied to example systems and the appropriate programs will be used for training purposes



Germany

Duration: 3 days
Code No.: 9CA4030-OHE00-OBG1
Language: English
Location: Nuremberg
Price: 1,655 EUR

Dates: 04.03. - 06.03.2009

Contact:
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Germany

Duration: 3 days
Code No.: 9CA4030-OHE00-0BD1
Language: English
Location: Nuremberg
Price: 1,565 EUR

Dates: on request

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Germany

Duration: 3 days
Code No.: 9CA4030-OHE00-0BC8
Language: English
Location: Nuremberg
Price: 1,565 EUR

Dates: on request

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Germany

Duration: 2 days
Code No.: 9CA4030-OHE00-0BF8
Language: English
Location: Nuremberg
Price: 1,040 EUR

Dates: on request

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Design and settings of protection schemes for industrial grids

Training objectives:

The participants will gain knowledge about protection of industrial systems. They will know the special requirements for the protection of industrial networks.

The training is intended for:

Employees from electrical distribution companies and power utilities responsible for the planning and operation of power system protection.

Recommended prior knowledge:

Basic knowledge of protection technology.

Main features:

- Relay-relevant performance of public industrial power systems
- Behavior of current and voltage transformers and influence to network protection
- Registration of earth fault and earth fault protection
- Structure of protection schemes for industrial systems
- Typical protection concepts for
 - Lines
 - Power transformers
 - Motors
 - Generator
- Protection of systems with dispersed generation and system perturbation
- Protection coordination principles will be applied to examples systems and the appropriate programs will be used for training purposes
- Practical exercises with SIPROTEC devices



Germany

Duration: 3 days
Code No.: 9CA4030-OHE00-0BF7
Language: English
Location: Nuremberg
Price: 1,565 EUR

Contact:
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Dates:
 on request

Expert workshop for protection technology

Training objectives:

The participants are studying complex fault situations with a transient network analyzer, considering different network and protection systems.

The training is intended for:

Experts for relay applications from utilities and industry.

Recommended prior knowledge:

Expert knowledge of protection technology.

Main features:

- Transient optimization of protection parameters
- Power swing in different voltage levels
- Automatic reclosure and synchronisation
- Differential protection and communication
- Simulation of protection communication lines
- Analysis of fault records and protocols
- Exchange of expert experience
- FACTS and series compensation

Note:

Instead of viewing prepared slides, the basis of this workshop are the questions and problems of the participants, exchange of experience and practical work with protection devices, using DIGSI / SIGRA. The location is the place of employment of the trainer. Normally, he is testing new firmware versions during the development. Also customer acceptance tests are done for critical network configurations, where exchange of experience and transient optimization of the settings are the main topics. For the practical work, a real time digital simulator RTDS is available. This RTDS can simulate networks with up to 100 single phase nodes, including lines, cables, sources, generators, CTs, CVTs, breakers, series capacitors and shunt reactors.



Germany

Duration: 5 days
Code No.: 9CA4030-OHE00-0BF4
Language: English
Location: Erlangen
Price: 3,310 EUR

Contact:
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Dates:
 16.03. - 20.03.2009
 27.07. - 31.07.2009

Expert workshop for generator protection technology

Training objectives:

The participants are studying complex fault situations with a transient network analyzer, considering different network and protection systems.

The training is intended for:

Experts for relay applications from utilities and industry.

Recommended prior knowledge:

Expert knowledge of protection and generator technology.

Main features:

- Transient optimization of protection parameters
- Generator stability and power swing in different voltage levels
- Automatic reclosure and synchronization
- Differential protection and communication
- Simulation of protection communication lines
- Analysis of fault records and protocols
- Exchange of expert experience
- FACTS and series compensation



Germany

Duration: 5 days
Code No.: 9CA4030-OHE00-0BF6
Language: English
Location: Erlangen
Price: 3,310 EUR

Contact:
 Isabell Siskov
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Dates:
 04.05. - 08.05.2009
 05.10. - 09.10.2009

DIGSI 4 – Basic course – Protection and control functions

Training objectives:

The participants will get to know the DIGSI 4 operating program. They will learn how to adjust, manage, operate and analyze faults of SIPROTEC 4 devices using the DIGSI 4 operating program. They use the DIGSI 4 program to configure and perform their own functions and control tasks.

The training is intended for:

Users from electric utilities and the industrial sector interested in the commissioning, maintenance and operation of SIPROTEC 4 devices.

Recommended prior knowledge:

Basic knowledge of electrical engineering.

Main features:

- Introduction
- Plant and equipment management
- Configuring of protection settings of SIPROTEC4 devices
 - Data management
 - Parameter assignment
 - Project planning
- Commissioning phase
 - Checking of inputs / outputs
 - Simulating faults
 - Analyzing fault records
- Control of switching devices
 - Interlocked / not interlocked
 - Local / remote control
- Graphical configuring of logic functions and interlocking with the logic editor CFC
- Graphical configuring of the basic and control display with the display editor
- Practical application of all topics



Germany, Austria, United Kingdom

Duration: 3 days
Code No.: 9CA4030-OHE00-0BA8 (N) 26.11. - 28.11.2008 (V)
 9CA4030-OHE00-0BF3 (V) 09.02. - 11.02.2009 (N)
 9CA4030-OHE00-0BH3 (H) 24.02. - 26.02.2009 (H)
Language: English 04.03. - 06.03.2009 (V)
Location: Nuremberg, Vienna, Hebburn 16.06. - 18.06.2009 (H)
Price: 1,985 EUR (N,V), 1,650 GBP (H) 17.06. - 19.06.2009 (V)
 29.06. - 01.07.2009 (N)

Contact:
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Phil Letouze (Hebburn)
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DIGSI 4 – Advanced course – Protection and control functions

Training objectives:

The participants will be able to implement the knowledge acquired in the basic DIGSI 4 course in the context of a typical project application. The basic knowledge will be deepened by learning extended functionality of the CFC and the display editor. Participants will be able to create and test user-specific functions.

The training is intended for:

Users from power supply utilities and industry who deal with the configuration, commissioning, maintenance and operation of SIPROTEC 4 devices.

Recommended prior knowledge:

Course "DIGSI 4 –Basic course – Protection and control functions".

Main features:

- Configuring a double busbar configuration with the outgoing cable and transformer feeder typicals, as well as bus coupler
- Learning extended functionality of the display editor and further CFC blocks (multiple-page default and control displays, display of extended measured operating values and display of counted values)
- Higher-level interlocking with the Logic Editor CFC
- Bay-related switching sequences
- Displaying transformer tap position
- Working with message texts, status information and interlocking texts
- Evaluation of fault records

DIGSI 4 IEC 61850 – Configuration of substations and devices

Training objectives:

Participants will be familiar with the concept and configuration of device communication via the IEC 61850 protocol on the basis of data exchange between the devices belonging to the bay or station level and connected on Ethernet bus. The basics of the Ethernet communication profile and the application of diverse communication topologies will be presented.

The training is intended for:

Employees of power supply utilities and industry who deal with the planning, configuration, commissioning, maintenance and operation of numeric bay and station automation systems.

Recommended prior knowledge:

Course "DIGSI 4 –Basic course – Protection and control functions".

Main features:

- Structure of the IEC 61850 profile
- Principle of communication between the components connected on the Ethernet bus
- Structure of Ethernet communication networks (topology, architecture, components and addressing)
- Networking of IEC 61850 devices
- Configuration of bus segments or IEC 61850 stations
- Publishing and subscribing information on the bus (vendor-independent inter-device communication)
- Higher-level interlocking via the Ethernet bus
- Configuring bay-to-bay communication with DIGSI 4

DIGSI 4 – CFC workshop

Training objectives:

The participants work on and discuss the realization of their protection and control instrumentation automation requirements. They will get useful tips all around the subject of graphic configuring of automation tasks. Furthermore, they will become familiar with the CFC blocks in detail.

The training is intended for:

Users from electric utility sector and from that sector of industry dealing with assembly, maintenance and operation of SIPROTEC 4 devices.

Recommended prior knowledge:

Course "DIGSI 4 –Advanced course – Protection and control functions".

Main features:

- Providing background knowledge about the run sequence task levels and CPU utilization
- Interpretation of the CFC consistency check
- New CFC blocks
- Application collection
- Documentation of CFC charts
- Exchange of experience with fellow users
- Exercises on all topics

SIGRA – Efficient interpretation of fault records

Training objectives:

The participants will be able to apply SIGRA 4 efficiently, to analyze fault records presented in the Comtrade format and will be able to understand the protection's behavior. After a brief introduction to the views and diagrams of SIGRA, the ways of fault record analysis will be explained. In the practical part, the participants will analyze fault records, which have been prepared with a real-time simulator for this training. The results of this analysis will be extensively discussed at the end of each exercise. The analysis emphasizes timings, variations of current and voltages, determination of impedances and fault location as well as the analysis for harmonics.

The training is intended for:

Employees of power supply companies and industry who deal with the configuration, commissioning, maintenance and operation of numeric power system and machine protection devices.

Recommended prior knowledge:

Basic knowledge of protection and machine protection technology

Main features:

- Structure of the Comtrade format of fault records
- SIGRA 4 – Structure of program and data
- SIGRA 4 – Ways to analyze and present
- Interpretation of different fault records (power system faults on lines, cables and on power transformers, automatic reclosings, too)
- Analysis of higher harmonics
- Export of Comtrade files
- Documentation of fault records
- DIGSI 4 – doing the respective settings in the protection device



Germany

Duration: 3 days
Code No.: 9CA4030-0HE00-0BD5
Language: English
Location: Nuremberg
Price: 1,985 EUR

Dates:
 27.10. - 29.10.2008
 16.02. - 18.02.2009
 06.07. - 08.07.2009

Contact:

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Germany

Duration: 2 days
Code No.: 9CA4030-0HE00-0BD7
Language: English
Location: Nuremberg
Price: 1,325 EUR

Dates:
 30.10. - 31.10.2008
 19.02. - 20.02.2009
 09.07. - 10.07.2009

Contact:

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 E-mail: isabell.siskov@siemens.com



Germany

Duration: 2 days
Code No.: 9CA4030-0HE00-0BC2
Language: English
Location: Nuremberg
Price: 662 EUR

Dates:
 23.03. - 24.03.2009

Contact:

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 Fax: +49 911 433-7929
 E-mail: isabell.siskov@siemens.com



Germany

Duration: 2 days
Code No.: 9CA4030-0HE00-0BD6
Language: English
Location: Nuremberg
Price: 1,325 EUR

Dates:
 12.02. - 13.02.2009
 02.07. - 03.07.2009

Contact:

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SIPROTEC 4 – Using numerical protection devices

Training objectives:

The application-oriented course provides the participants with theoretical tools for protection engineering, relay setting, commissioning of relay systems, system fault and relay operation analysis, troubleshooting and repair.

The training is intended for:

Engineers working in the field of protection, i.e. engineering, operation, commissioning, maintenance and repair.

Recommended prior knowledge:

Basic knowledge of protection technology.

Main features:

- Overview and concept
- Overcurrent protection devices 7SJ
- Operation by DIGSI 4
- Distance protection device 7SA
- Exercises with overcurrent and distance protection devices 7SJ / 7SA
- Current comparison protection device 7SD / 7SD
- Transformer differential device 7UT6
- Busbar protection 7SS / 7SS
- Exercises with line, transformer and busbar differential devices

SIPROTEC 4 – Distributed busbar protection 7SS – Intensive course

Training objectives:

The participants become familiar with the principle of operation, the applications and functions of the 7SS distributed busbar protection.

The training is intended for:

Employees from utilities or industry involved in the planning, commissioning and maintenance of busbar protection systems.

Recommended prior knowledge:

Basic knowledge of protection technology.

Main features:

- Introduction to the principle of busbar protection
- Features of a numerical busbar protection relay
- Characteristics of a distributed concept
- Operation and configuration of the 7SS
- Functions of the 7SS busbar protection
- Functions of the circuit breaker failure protection
- Additional functions
- Protection algorithms
- Safety functions
- Explanation of parameters
- Current transformer requirements

SIPROTEC 4 – Protection devices for service engineers

Training objectives:

Participants will have a deeper understanding of the nature of numerical protection devices. They will understand the meaning of bountiful settings and how to analyze malfunctions and know remedies thereof.

The training is intended for:

Engineers of power supply utilities and industry who deal with the planning, configuration, commissioning, maintenance and operation of numeric protection systems.

Recommended prior knowledge:

Basic knowledge of protection technology.

Main features:

- Principles and virtues of numerical protection devices
- Hardware of numerical protection and settings thereof
- Operating software DIGSI by a scenario
- Numerical protection: What has to be tested of it?
- Exercises accordingly and more with:
 - O/C protection 7SJ
 - Impedance protection 7SA
 - Transformer differential protection 7UT
 - Cable and line differential protection 7SD
 - Busbar differential protection 7SS
- Quality assurance / repair forms

SIPROTEC 4 – Protection devices for expert engineers

Training objectives:

Participants will have a deeper knowledge of the state-of-the-art protection of power transmission systems. They will know how to conceive complex protection schemes and be familiar with the special requirements for the protection of high and extra-high-voltage systems.

The training is intended for:

Engineers of power supply utilities and industry who deal with the planning, configuration and settings of numeric protection systems.

Recommended prior knowledge:

Basic knowledge of protection technology.

Main features:

- The task of protection systems
- What methods of protection are in use?
- The nature of numerical protection
- CT requirements
- CT evaluating and dimensioning
- Data acquisition of transmission lines and cables
- Distance protection 7SA
- Transformer differential protection 7UT
- Line differential protection 7SD
- Motor protection
- Busbar differential protection 7SS and 7SS



Germany, United Kingdom

Duration: 4 days (N), 3 days (H) **Dates:**
Code No.: 9CA4030-OHE00-OBA3 (N) 03.03. - 06.03.2009 (N)
 9CA4030-OHE00-OBH2 (H) 24.03. - 26.03.2009 (H)
Language: English 15.09. - 18.09.2009 (N)
Location: Nuremberg, Nuremberg (N)
 Hebburn Hebburn (H)
Price: 2,085 EUR (N), 1,650 GBP (H)

Contact:
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 phil.letouze@siemens.com



Germany

Duration: 3 days **Dates:**
Code No.: 9CA4030-OHE00-OBA4 19.01. - 21.01.2009
Language: English 27.07. - 29.07.2009
Location: Nuremberg
Price: 1,985 EUR

Contact:
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Germany, United Kingdom

Duration: 5 days **Dates:**
Code No.: 9CA4030-OHE00-OBE6 (N) 16.03. - 20.03.2009 (N)
 9CA4030-OHE00-OBH5 (H) on request (H)
Language: English
Location: Nuremberg, Nuremberg (N)
 Hebburn Hebburn (H)
Price: 2,365 EUR (N), 3,200 GBP (H)

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Germany

Duration: 5 days **Dates:**
Code No.: 9CA4030-OHE00-OBE7 23.02. - 27.02.2009
Language: English
Location: Nuremberg
Price: 2,365 EUR

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SIPROTEC 4 – Using numerical machine and motor protection

Training objectives:

The participants will gain knowledge of the mode of operation, applications and configuration of numerical unit and auxiliary protection systems.

The training is intended for:

Employees from utilities and that sector of industry concerned with planning, maintenance and testing of machine protection equipment.

Recommended prior knowledge:

Basic knowledge of protection technology.

Main features:

- Introduction to the principles of machine protection
- Short circuit protection
- Recommendations on CT coordination
- Differential protection on machines
- Rotor earth fault protection
- Underexcitation protection
- Principles of stator earth fault protection
- Engineering of stator earth fault protection
- Configuration examples
- Practical exercises with protection devices 7UM6 as motor protection
- Synchronization device 7VE6

SIPROTEC 4 – Relay secondary testing of the product families 7SJ, 7SA and 7UT / SD with the OMICRON test system

Training objectives:

The course is subjected to the most important relay parameters and their secondary testing. Special attention is paid on the creation and verification of automatic relay test documents for line and cable protection based on the OMICRON test set.

The training is intended for:

Engineers and technicians of power utilities and industries who deal with commissioning and periodic testing of protective relays.

Recommended prior knowledge:

Basic knowledge of protection technology.

Main features:

- Introduction to the relay test system (software architecture, hardware configuration, interfaces, programming and automation)
- Presentation of the test technology (which functions, how to be tested, scope of testing)
- Testing time grading protection according to the two-day-training "Relay secondary testing"
- The third day is concentrated on the testing of differential protection:
 - Testing the relay and system configuration
 - Testing the operating characteristics
 - Testing the harmonic restraint function



Germany, United Kingdom

Duration: 3 days
Code No.: 9CA4030-OHE00-OBE4 (N) 19.01. - 21.01.2009 (N)
 9CA4030-OHE00-OBH4 (H) 20.07. - 22.07.2009 (N)
Language: English on request (H)
Location: Nuremberg Nuremberg (N)
 Hebburn Hebburn (H)
Price: 2,085 EUR (N), 2,000 GBP (H)

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Germany

Duration: 4 days
Code No.: 9CA4030-OHE00-0BB2
Language: English
Location: Nuremberg
Price: 2,085 EUR
Dates: 27.01. - 30.01.2009

Contact:
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SIPROTEC 4 – Practical workshop

Training objectives:

The participant has knowledge of concept and application of the protection systems that was agreed upon.

The training is intended for:

Engineers working in the field of protection, i.e. engineering, operation, commissioning, maintenance and repair.

Recommended prior knowledge:

Basic knowledge of protection technology

Main features:

- Singly or in small groups, participants will use a training unit (such as 7SJ., 7SA., 7SD., 7UT.)
 - Operation of SIPROTEC devices
 - Engineering and parameterization of protection units with user interface and engineering software DIGSI 4
 - Checking setting values and functionality by using numerical test equipment

This work will be conducted some of the time with an instructor.

The topics will be decided on in consultation with the participants so as to meet their requirements.



Germany

Duration: on request
Code No.: 9CA4030-OHE00-0BC3
Language: English
Location: Erlangen
Price: 410 EUR / day
Dates: on request

Contact:
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 Fax: +49 911 433-7929
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Protection technology – Line protection testing with the CMC test system TU 2.x

Training objectives:

Participants learn how to test the essential parameters of line protection systems with the CMC test set. Performing hands-on tests at the OMICRON Test Towers in small groups of 2 to 3 persons, they intensify the acquired knowledge and create flexible test documents for automated relay test runs.

The training is intended for:

Personnel from electric utilities or industrial enterprises responsible for testing and maintaining line protection systems.

Recommended prior knowledge:

Basic knowledge of protection technology

Main features:

- Easy and quick control of test current and voltage (QuickCMC)
- Using the fault calculator and the test shot setting modes
- Using XRIO technology
- Using the OMICRON control center, creating automated test runs
- Defining the protection ratings and set points (manually or via XRIO-converter)
- Test hardware configuration
- Testing the starting system, zone reaches and trip times (distance, advanced distance)
- Testing the switch-onto-fault functionality (state sequencer)
- Testing backup overcurrent protection (overcurrent)

Note:

The OMICRON Test Towers are equipped with protective relays from different manufacturers as well as with the OMICRON SimBox, which simulates the fields related to the relays. The course is given by a trainer from OMICRON.



Germany

Duration: 2 days
Code No.: 9CA4030-OHE00-0BG3
Language: English
Location: Erlangen
Price: 1,100 EUR
Dates: 28.04. - 29.04.2009

Contact:
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 E-mail: isabell.siskov@siemens.com

Secondary Equipment – Protection Systems

Protection technology – Line protection and transformer differential protection testing with the CMC test system TU 2.x

Training objectives:

Participants learn how to test the essential parameters of line protection and transformer differential protection systems with the CMC test set. Performing hands-on tests at the OMICRON Test Towers in small groups of 2 to 3 persons, they intensify the acquired knowledge and create flexible test documents for automated relay test runs.

The training is intended for:

Personnel from electric utilities or industrial enterprises responsible for testing and maintaining line protection and transformer differential protection systems.

Recommended prior knowledge:

Basic knowledge of protection technology.

Main features:

- Easy and quick control of test current and voltage (QuickCMC)
- Using the Fault Calculator
- Using the XRIO technology
- Using the OMICRON Control Center, creating automated test runs
- Defining the protection ratings and set points (manually or via XRIO converter)
- Test hardware configuration
- Testing the starting system, zone reaches and trip times (distance, advanced distance)
- Testing the switch-onto-fault functionality (State Sequencer)
- Testing backup overcurrent protection (overcurrent)
- Testing the system configuration and zero system elimination (advanced differential)
- Testing the operating characteristic (differential, advanced differential)
- Testing the trip times (differential, advanced differential)
- Testing the harmonic restraint function (differential, advanced differential)

Note:

The OMICRON Test Towers are equipped with relays from different manufacturers as well as with the OMICRON SimBox, which simulates the fields related to the relays. The course is given by a trainer from OMICRON.



Germany

Duration: 3 days
Code No.: 9CA4030-0HE00-0BG4
Language: English
Location: Erlangen
Price: 1,100 EUR
Dates: 28.04. - 30.04.2009

Contact:

Isabell Siskov
 Phone: +49 911 433-7005
 Fax: +49 911 433-7929
 E-mail: isabell.siskov@siemens.com

Protection technology – Complete testing of multifunctional distance relays with the CMC test system TU 2.x

Training objectives:

Participants learn how to test additional parameters beyond the main protective function in order to create complete test documents for multifunctional distance relays. Emphasis is given to testing the rather complex additional functions including the ones for which there are no standard test modules in the OMICRON software. Hands-on testing at the OMICRON Test Towers intensifies the acquired knowledge.

The training is intended for:

Personnel from electric utilities or industrial enterprises responsible for testing and maintaining generator protection systems.

Recommended prior knowledge:

Course "Line protection testing with the CMC test system TU 2.x" and "Line protection and transformer differential protection testing with the CMC test system TU 2.x" or assertive handling of the CMC test system is mandatory.

Main features:

- Using the OMICRON Control Center, creating automated test runs
- Defining the protection set points (manually or via XRIO converter)
- Extending standard XRIO converters
- Configuring the hardware
- Testing the starting system (distance, advanced distance, VI starting)
- Testing ground fault detection (ground fault)
- Testing auto reclosure (autoreclosure)
- Testing teleprotection schemes (state sequencer, GPS)
- Annunciation check (annunciation checker)
- Fault recording and analysis (transplay, advanced transplay)

Note:

The OMICRON Test Towers are equipped with relays from different manufacturers as well as with the OMICRON SimBox, which simulates the fields related to the relays.



Germany

Duration: 2.5 days
Code No.: 9CA4030-0HE00-0BG5
Language: English
Location: Erlangen
Price: 1,100 EUR
Dates: 10.11. - 12.11.2009

Contact:

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 Fax: +49 911 433-7929
 E-mail: isabell.siskov@siemens.com

Protection technology – Generator protection testing with the CMC test system and TU 2.x

Training objectives:

Participants learn how to test the essential parameters of generator protection systems with the CMC test set and how to create flexible test documents for automated relay test runs.

The training is intended for:

Personnel from electric utilities or industrial enterprises responsible for testing and maintaining generator protection systems.

Recommended prior knowledge:

Basic knowledge of protection technology

Main features:

- Easy and quick control of test current and voltage (QuickCMC)
- Using the Fault Calculator
- Using XRIO technology
- Using the OMICRON Control Center, creating automated test runs
- Defining the protection ratings and set points (manually or via XRIO converter)
- Test hardware configuration
- Testing the starting system
- Testing overcurrent protection
- Testing frequency protection
- Testing voltage protection
- Taking into account generator differential protection for the following tests
- Testing overcurrent protection with voltage stability
- Testing reverse power protection
- Testing unbalanced load protection
- Testing overload protection
- Testing underexcitation protection
- Testing overexcitation protection
- Testing 90 %/100% stator earth fault protection
- Testing rotor earth fault protection

Note:

Users who are experienced in using the CMC test set have the possibility to sign up for the second training day only. Please indicate this on registration. The course is given by a trainer from OMICRON.



Germany

Duration: 2 days
Code No.: 9CA4030-0HE00-0BG6
Language: English
Location: Erlangen
Price: 1,100 EUR
Dates: 26.03. - 27.03.2009

Contact:

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REYROLLE Protection product training DAD-N (high-impedance schemes)

Training objectives:

This course provides participants with an understanding of the use, application and installation of the REYROLLE protection device DAD-N providing numeric high-impedance protection and its application schemes to protect busbars and other equipment.

The training is intended for:

Engineers working in the operations, testing and construction areas of power systems.

Recommended prior knowledge:

The course is based around the product and is recommended for engineers who will be involved with the use or application of the product. The training would be valuable to experienced engineers not familiar with the product and to engineers just entering the field of power system protection.

Main features:

- Purpose and functionality of the relay and schemes
- Model variants
- Relay build, features and operating characteristics
- Applications and setting guidelines for the relay
- Setting and configuration of the relay both from the relay fascia and from a PC using the data comms channel(s)
- Description of associated settings, configuration and interrogation software / PC interface
- Description of products and accessories associated with the various schemes
- Advice on test and commissioning aspects
- Related health and safety issues



United Kingdom

Duration: 1 day
Code No.: 9CA4030-2HE00-0BA1
Language: English
Location: Hebburn
Price: 600 GBP
Dates: 05.11.2008
 08.04.2009

Contact:

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 E-mail: phil.letouze@siemens.com

REYROLLE Protection product training RECLOSER-M CONTROLLER 7SR224

Training objectives:

This course provides participants with an understanding of the use, application and installation of the RECLOSER-M CONTROLLER protection device providing auto-reclose overcurrent protection.

The training is intended for:

Engineers working in the operations, testing and construction areas of power systems.

Recommended prior knowledge:

The course is based around the product and is recommended for engineers who will be involved with the issue or application of the product. The course would be valuable to experienced engineers not familiar with the product and to engineers just entering the field of power system protection.

Main features:

- Purpose and functionality of the relay
- Model variants
- Relay build, features and operating characteristics
- Applications and settings guidelines for the relay
- Setting and configuration of the relay both from the relay fascia and from a PC using the data comms channel
- Description of associated settings, configuration and interrogation software / PC interface
- Advice on test and commissioning aspects
- Related health and safety issues

Note:

The course will take the form of a PowerPoint presentation and practical demonstration of the RECLOSER-M CONTROLLER relay.

REYROLLE Protection product training ARGUS 1 – ARGUS 6

Training objectives:

This course provides participants with an understanding of the use, application and installation of the REYROLLE protection device ARGUS providing overcurrent protection (non-directional and directional).

The training is intended for:

Engineers working in the operations, testing and construction areas of power systems.

Recommended prior knowledge:

The course is based around the product and is recommended for engineers who will be involved with the use or application of the product. The course would be valuable to experienced engineers not familiar with the product and to engineers just entering the field of power system protection.

Main features:

- Purpose and functionality of the relay
- Model variants
- Relay build, features and operating characteristics
- Applications and settings guidelines for the relay
- Setting and configuration of the relay both from the relay fascia and from a PC using the data comms channel(s)
- Description of associated settings, configuration and interrogation software / PC interface
- Advice on test and commissioning aspects
- Related health and safety issues

REYROLLE Protection product training itinerary DUOBIAS

Training objectives:

This course provides participants with an understanding of the use, application and installation of the REYROLLE protection device DUOBIAS providing differential protection for transformers.

The training is intended for:

Engineers working in the operations, testing and construction areas of power systems.

Recommended prior knowledge:

The course is based around the product and is recommended for engineers who will be involved with the use or application of the product. The course would be valuable to experienced engineers not familiar with the product and to engineers just entering the field of power system protection.

Main features:

- Purpose and functionality of the relay
- Model variants
- Relay build, features and operating characteristics
- Applications and setting guidelines for the relay
- Setting and configuration of the relay both from the relay fascia and from a PC using the data comms channel(s)
- Description of associated settings, configuration and interrogation software / PC interface
- Advice on test and commissioning aspects
- Related health and safety issues

REYROLLE Protection product training SOLKOR Rf schemes

Training objectives:

This course provides participants with an understanding of the use, application and installation of the REYROLLE protection device SOLKOR Rf providing classical line differential protection via pilot wires and its application schemes with pilot wire supervision and injection intertrip.

The training is intended for:

Engineers working in the operations, testing and construction areas of power systems.

Recommended prior knowledge:

The course is based around the product and is recommended for engineers who will be involved with the use or application of the product. The training would be valuable to experienced engineers not familiar with the product and to engineers just entering the field of power system protection.

Main features:

- Purpose and functionality of the relay and schemes
- Model variants
- Relay build, features and operating characteristics
- Applications and setting guidelines for the relay
- Setting and configuration of the relay from the relay fascia
- Description of products and accessories associated with the various schemes like pilot wire supervision and injection
- Intertrip
- Advice on test and commissioning aspects
- Related health and safety issues



United Kingdom

Duration: 1 day
Code No.: 9CA4030-2HE00-0BA5
Language: English
Location: Hebburn
Price: 600 GBP

Dates:
 05.11.2008
 14.01.2009
 04.03.2009

Contact:
 Phil Letouze
 Phone: +44 191 495-3449
 Fax: +44 191 495-3693
 E-mail:
 phil.letouze@siemens.com



United Kingdom

Duration: 1 day
Code No.: 9CA4030-2HE00-0BA2
Language: English
Location: Hebburn
Price: 600 GBP

Dates:
 12.11.2008
 15.04.2009

Contact:
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 Fax: +44 191 495-3693
 E-mail:
 phil.letouze@siemens.com



United Kingdom

Duration: 1 day
Code No.: 9CA4030-2HE00-0BA3
Language: English
Location: Hebburn
Price: on request

Dates:
 on request

Contact:
 Phil Letouze
 Phone: +44 191 495-3449
 Fax: +44 191 495-3693
 E-mail:
 phil.letouze@siemens.com



United Kingdom

Duration: 1 day
Code No.: 9CA4030-2HE00-0BA4
Language: English
Location: Hebburn
Price: on request

Dates:
 26.11.2008
 29.04.2009

Contact:
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 Fax: +44 191 495-3693
 E-mail:
 phil.letouze@siemens.com

SICAM PAS – Basic course

Training objectives:

The participants will gain basic knowledge of SICAM PAS system and how to use it. They will learn about the operation and will find out how to use this in the system management.

The training is intended for:

Customers from power utilities and industry responsible for operating a SICAM PAS system.

Recommended prior knowledge:

Basic electrical engineering.

Main features:

- Overview of SICAM PAS total system
- System architecture
- Hardware and software components
- Communication functions
- Communication with IEC 61850
- Software tools SICAM PAS UI Configuration and UI Operation
- Test- and diagnostic tool SICAM Value Viewer
- HMI system SICAM PAS CC
- Operator control, including practical training on an example configuration
- Basics of system and fault diagnosis

SICAM PAS – Parameterization

Training objectives:

The participants will be able to independently set up a SICAM PAS configuration.

The training is intended for:

Customers from power utilities and industry who wish to do user-specific parameterization.

Recommended prior knowledge:

Course "SICAM PAS – Basic course".

Main features:

- Overview of SICAM PAS total system
- Installing SICAM PAS software
- Configuring an IEC 870-5-101 substation interface
- How to use device descriptions (files)
- SICAM Value Viewer
- Configuring an IEC 870-5-101/104 control center interface
- Configuring an IEC 870-5-103 IED interface
- Server DIP configuration
- Normalizing measured values
- Configuring a PAS CC interface
- Basics of automation
- OPC communication
- How to connect a IEC 61850 IED
- Practical exercises covering all topics

SICAM PAS CC – Configuring an operator station

Training objectives:

The participants are able to configure a graphical operator station.

The training is intended for:

Customers from power utilities and industry who wish to be able to modify the graphical user interface.

Recommended prior knowledge:

Course "SICAM PAS – Basic course".

Main features:

- System overview of SICAM PAS CC
- Fundamentals of the basic system SIMATIC WinCC
- Installing SICAM PAS CC software
- Devising a project
- Taking over data from SICAM PAS
- Structure of SICAM PAS information
- Configuring the graphical interface
- SICAM PAS Symbol Library
- Configuring Message lists
- Analog value archive
- SICAM RECPRO – Fault record processing
- Practical exercises covering all topics

SICAM PAS – Automation with CFC, ST and SFC

Training objectives:

The participants will know the most important CFC blocks and how to use them. Furthermore, they learn about the advantages of the programming language ST (Structured Text), which was especially developed for automation systems. Both of the tools will be used to parameterize and program examples for various applications.

The training is intended for:

Customers who are in charge of parameterization and programming of PAS systems.

Recommended prior knowledge:

Course "SICAM PAS – Parameterization".

Main features:

- Introduction to PAS Automation
- Frequently used CFC blocks
- Application of CFC in various examples
- Primary use of ST and CFC
- Writing programs / functions / function blocks with ST
- Combinations of CFC and ST
- SFC – sequential function chart for switching sequences



Germany

Duration: 3 days
Code No.: 9CA4030-OJE00-0BB4
Language: English
Location: Nuremberg
Price: 1,985 EUR

Contact:

Isabell Siskov
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 Fax: +49 911 433-7929
 E-mail: isabell.siskov@siemens.com



Germany

Duration: 5 days
Code No.: 9CA4030-OJE00-0BB8
Language: English
Location: Nuremberg
Price: 3,310 EUR

Contact:

Isabell Siskov
 Phone: +49 911 433-7005
 Fax: +49 911 433-7929
 E-mail: isabell.siskov@siemens.com



Germany

Duration: 3.5 days
Code No.: 9CA4030-OJE00-0BC1
Language: English
Location: Nuremberg
Price: 2,315 EUR

Contact:

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 Fax: +49 911 433-7929
 E-mail: isabell.siskov@siemens.com



Germany

Duration: 3 days
Code No.: 9CA4030-OJE00-0BC4
Language: English
Location: Nuremberg
Price: 1,985 EUR

Contact:

Isabell Siskov
 Phone: +49 911 433-7005
 Fax: +49 911 433-7929
 E-mail: isabell.siskov@siemens.com

SICAM PAS – Diagnosis and troubleshooting workshop

Training objectives:

The participants will get ample knowledge in bay and substation control technology (PAS), visualization and handle or follow respectively (WinCC), network and communication technology (Ruggedcom). The course provides systematical diagnosis and troubleshooting about the entire system.

The training is intended for:

Customers from power utilities and industry who have a SIPROTEC, PAS, WinCC, RuggedCom system in operation. Experts for parameterization and commissioning.

Recommended prior knowledge:

Basic knowledge of electrical engineering.

Knowledge about:

- Bay and substation control technology (PAS)
- Visualization (PAS CC)
- Network and communication technology

Main features:

- Introduction
- IEC 101/104 protocol description and test tools
- DSI – Tracing and process simulation
- Network sniffing with ethereal
- Network sniffing (IEC101/104 telegrams) / Systematical approach to identify communication problems
- RuggedCom
 - Settings, IP, SMNP
 - Configuration concepts
 - Diagnostic
- Features of new station unit / EWF settings and handling
- Recovery CD, image generation compatibility (software, communication) / peripheral devices
- Time synchronization (GPS, SNTP) and SNMP; NetView
- Web Monitor for SIPROTEC / EN100 homepage
- IEC Browser
- IEC 61850 devices
- WinCC diagnostic tools
- Scripting
- WinCC archiving, options
- FAQ pages of industry sector
- Preparation of commissioning / commissioning tools
- Systematical fault analysis
- PAS CFC & ST debugging
- Remote maintenance / archiving, backup
- Question form, process to hotline
- Visit in Customer Care Center
- Discussion of Customer Care Interface



Germany

Duration: 5 days
Code No.: 9CA4030-OJE00-0BC6
Language: English
Location: Nuremberg
Price: 3,310 EUR

Dates:
on request

Contact:

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 E-mail:
 isabell.siskov@siemens.com

Substation automation – Practical workshop

Training objectives:

Singly or in small groups, participants will use a training system and become familiar with the concept, structure and applications of the SICAM system.

The training is intended for:

Employees from utilities and industry. Planners, operators and commissioning engineers working with substation automation systems in power supply networks, commissioning technicians.

Recommended prior knowledge:

Basic knowledge of substation automation systems

Main features:

- Basic knowledge of structure of system and equipment
 - System architecture
 - Process interfacing
 - Bay control units
 - Communication
 - Telecontrol protocols
 - Communication with bay control units
- Basic knowledge of PC-TOOLS



Germany

Duration: on request
Code No.: 9CA4030-OJE00-0BB5
Language: English
Location: Nuremberg
Price: 410 EUR / day

Dates:
on request

Contact:

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 isabell.siskov@siemens.com

Engineering of bay controllers 6MD66 with IEC 61850

Training objectives:

The participant will learn how to adjust, manage and operate 6MD66 devices using the DIGSI 4 operating program.

The training is intended for:

Users from power supply utilities and industry who deal with the configuration, commissioning, maintenance and operation of 6MD66 devices

Recommended prior knowledge:

Training "DIGSI 4 – Basic course – Protection and control functions"

Main features:

- Design and scope of functions based on double busbar configuration 6MD66
- Substation-related interlocking (IEC 61850)
- Bay-related switching sequences
- Bay-related interlocking
- Application of the display editor for a double busbar configuration
- Application for transformer tap changer



Germany

Duration: 2 days
Code No.: 9CA4030-OJE00-0BC3
Language: English
Location: Nuremberg
Price: 1,325 EUR

Dates:
05.02. - 06.02.2009
05.08. - 06.08.2009

Contact:

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 isabell.siskov@siemens.com

SICAM 1703 ACP – Designing station automation systems

Training objectives:

This course shows the open total solution for secondary equipment in substations and transformer substations with SICAM 1703 ACP. This station automation is used both in transport networks as well as in distribution networks. The configurations and functions will be explained and the variants resulting therefrom will be described.

The training is intended for:

We are thereby addressing decision-makers and planning personnel, as well as protection and control engineers.

Recommended prior knowledge:

Basic knowledge of substation technology (specific product knowledge is not necessary).

Main features:

- Station automation tasks
- Configurations
- Bay control unit (assembly, mechanical design, bay-related functions)
- Station control device (assembly, mechanical design, inter-bay functions)
- Station operation (assembly, mechanical design; functions)
- Interfacing of protective devices
- Control center coupling (telecontrol)
- Synchronization
- Operating concept (levels, local / remote)
- Revision concept (working and expansions on the running plant)
- Service concept (diagnostics, parameterization, test)
- System concepts (time management, general interrogation, failure management)



Germany, Austria

Duration: 2 days
Code No.: 9CA4030-3JE00-0BG2 (N)
 9CA4030-3JE00-0BA4 (V)
Language: English
Location: Nuremberg, Vienna
Price: 900 EUR

Dates:
 18.05. - 19.05.2009 (V)
 20.07. - 21.07.2009 (N)
 Nuremberg (N)
 Vienna (V)

Contact:
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Monika Schuecker (Vienna)
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 Fax: +43 51707-55243
 E-mail: power-academy.at@siemens.com

SICAM 1703 ACP – Power week

Training objectives:

The participants gain basic knowledge of the scalable automation system SICAM 1703 ACP and the configuration tool OPM II. They are able to independently carry out simple configuration changes as well as plant diagnosis. This one-week course focuses on practical exercises and has specifically been designed for technicians who quickly need to become familiar with the SICAM 1703 ACP world.

The training is intended for:

Technicians requiring a first, fast introduction to the SICAM 1703 ACP world.

Recommended prior knowledge:

Knowledge of the most important terms of telecontrol technology – e.g. completion of training: Introduction to Automation Technology.

Main features:

- Overview of SICAM 1703 ACP product line
- Basic concepts
- Toolbox II and OPM basic facts
- Testing, simulation and error analysis
- Data jumpering
- Process communication to other units of the SICAM 1703 ACP product line



Austria

Duration: 5 days
Code No.: 9CA4030-3JE00-0BA3
Language: English
Location: Vienna
Price: 2,500 EUR

Dates:
 01.12. - 05.12.2008
 09.03. - 13.03.2009
 04.05. - 08.05.2009
 07.09. - 11.09.2009

Contact:
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 Fax: +43 51707 55243
 E-mail: power-academy.at@siemens.com

SICAM ACP 1703 – Basic course

Training objectives:

The participants develop an understanding for the productivity of the scalable automation unit SICAM 1703 ACP.

- They gain an overview of the construction of SICAM 1703 ACP
- They will understand the most important functions
- They will know the basic working of SICAM 1703 ACP

The training is intended for:

Decision-makers and planning staff, and I&C and protection technicians.

Employees from Sales, project engineering and project handling.

Recommended prior knowledge:

Knowledge of the most important terms in telecontrol technology, e.g. from the training "Introduction to Automation Technology".

Main features:

- Product families at a glance
- The scalable automation concept SICAM 1703 ACP
- The features of the different automation units:
 - AK 1703 ACP automation module
 - TM 1703 ACP automation module
 - BC 1703 ACP automation module
- The mode of operation of SICAM 1703 ACP – from data acquisition to data output
- Diagnosis and test



Germany, Austria

Duration: 1 day
Code No.: 9CA4030-3JE00-0BG1 (N)
 9CA4030-3JE00-0BA5 (V)
Language: English
Location: Nuremberg, Vienna
Price: 490 EUR

Dates:
 03.11.2008 (V)
 09.03.2009 (V)
 20.04.2009 (N)
 Nuremberg (N)
 Vienna (V)

Contact:
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SICAM 1703 ACP – Service

Training objectives:

The participant gains the knowledge required to carry out the maintenance of the scalable automation system training "SICAM 1703 ACP – Basic course" (AK 1703 ACP/ TM 1703 ACP/ BC 1703 ACP) with the supplied system-related tools. The procedures for changes/ extensions are not given here.

The training is intended for:

Service technicians involved in the maintenance of SICAM 1703 ACP systems.

Technicians involved in the engineering of SICAM 1703 ACP systems.

Recommended prior knowledge:

Course "SICAM 1703 ACP – Basic course".

Main features:

- System architecture and hardware overview
- TOOLBOX II – handling in principle
- Diagnosis options
- How to change system elements
- Connection system, mechanical system
- Remote maintenance
- Practical exercises with TOOLBOX II and AK 1703 ACP
- TM 1703 ACP, BC 1703 ACP



Austria

Duration: 1 day
Code No.: 9CA4030-3JE00-0BA6
Language: English
Location: Vienna
Price: 490 EUR

Dates:
 04.11.2008
 10.03.2009

Contact:
 Monika Schuecker
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 Fax: +43 51707-55243
 E-mail: power-academy.at@siemens.com

SICAM 1703 ACP – OPM II – Basic course

Training objectives:

The participants learn to use the OPM II (Object-oriented Process data Manager) as the central engineering tool of TOOLBOX II. OPM II can be used both for modeling signals (alarms, measurements) and for creating high-value objects (power breakers, feeders, pumps).

The training is intended for:

Technicians involved in the maintenance of SICAM 1703 ACP systems.
Techniker/-innen der Projektierung von Wartenleitsystemen der SICAM-Familie.

Recommended prior knowledge:

Course "SICAM 1703 ACP – Basic course".

Main features:

- Overview of functionality
- Signal-orientated engineering
- Working with pre-designed libraries
- Handling large amounts of data
- Use of formulas and references
- Data import and export
- Creation of more significant objects
- Practical exercises



Duration: 2 days
Code No.: 9CA4030-3JE00-0BA8
Language: English
Location: Vienna
Price: 980 EUR

Dates:
05.11. - 06.11.2008
03.12. - 04.12.2008
11.03. - 12.03.2009

Contact:

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TM 1703 mic – Configuration

Training objectives:

The participant becomes familiar with the concept, performance characteristics and possible applications (e.g. speed monitor). Two configuration methods of TM 1703 mic are presented: either using the TM 1703 web surface and the browser, or using OPM II of TOOLBOX II. In the practical part of the course, the participant can decide which method he / she wants to use for configuration.

The training is intended for:

Service technicians involved in the maintenance of SICAM 1703 ACP systems.
Technicians involved in the engineering of automation systems.

Recommended prior knowledge:

Course "SICAM 1703 ACP – Basic course" and "SICAM 1703 ACP – OPM II Basic course".

Main features:

- Overview of the required hardware
- Initial operation
- Interface configuration
- Hardware data point configuration
- Documentation



Duration: 1 day
Code No.: 9CA4030-3JE00-0BB2
Language: English
Location: Vienna
Price: 470 EUR

Dates:
07.11.2008
13.03.2009

Contact:

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SICAM 1703 ACP – CAEx Plus

Training objectives:

Participants master the operation and creation of a steering task in destination system ACP 1703 with use of CAEx Plus. They learn the IEC 61131-conform programming language emphasizing FBD (Functional Block Diagram) and its use.

The training is intended for:

Automation technicians for SICAM 1703 ACP systems.

Recommended prior knowledge:

Basic knowledge of digital circuit technology
Basic knowledge of 1703 automation system
Training "SICAM 1703 ACP – OPM II Basic course"

Main features:

- Overview of norm IEC 61131
- Creation of data module for CAEx plus with OPM
- Handling of Functional-Block-Diagram CAEx plus
- Creation and structuring of a steering task
- Loading into destination system SICAM 1703 ACP
- Use of tests (OFFLINE, ONLINE oscilloscope)
- Creation of a documentation with CAEx plus



Duration: 2.5 days
Code No.: 9CA4030-3JE00-0BC8
Language: English
Location: Vienna
Price: 1,250 EUR

Dates:
10.11. - 12.11.2008
16.03. - 18.03.2009

Contact:

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SICAM 1703 ACP Configuration

Training objectives:

The participants learn to use and engineer SICAM 1703 ACP automation systems based on preconfigured templates, this including communication with other SICAM 1703 ACP devices and/or with the control system in the control room. First, we configure a SICAM 1703 ACP with the help of OPM and then create process variables that are processed in a CAEx plus function diagram. The seminar concludes with communication to another product of the ACP 1703 family, respectively, to a SICAM 230 control center system.

The training is intended for:

Service technicians involved in the maintenance of SICAM 1703 ACP systems.

Recommended prior knowledge:

Knowledge of Windows
Course "SICAM 1703 ACP – Basic course", "SICAM 1703 ACP – Service", "SICAM 1703 ACP – OPM II Basic course" and "SICAM 1703 ACP – CAEx Plus"
Experience with functional diagram execution – if such knowledge is lacking, attendance of seminar

Main features:

- Overview of functions of SICAM 1703 ACP
- The addressing principle (IEC 60870)
- Automatic data routing
- Parameter setting of communication
- Test and simulation possibilities with TOOLBOX II
- Extension and adaption of the preconfiguration with OPM and CAEx plus administration of parameters with TOOLBOX II: Import / export / backup
- Practical exercises with TOOLBOX II and AK 1703 ACP, TM 1703 ACP and BC 1703 ACP



Duration: 2.5 days
Code No.: 9CA4030-3JE00-0BA7
Language: English
Location: Vienna
Price: 1,250 EUR

Dates:
12.11. - 14.11.2008
18.03. - 20.03.2009

Contact:

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BC 1703 ACP – Configuration

Training objectives:

The participants grasp that in the BC 1703 ACP the protection and control functions are independent and work separately from each other. The seminar emphasizes the parameterization of this display. The configuration of the steering CPU is shown in the seminar SICAM 1703 ACP configuration. The participant masters the parameterization of pictures for the local display on the BC.

The training is intended for:

Service technicians involved in the maintenance of SICAM 1703 ACP systems.

Recommended prior knowledge:

Course "SICAM 1703 ACP – Power week" or "SICAM 1703 ACP – Configuration".

Main features:

- System architecture and hardware overview
- Designing the displays for the local display
- Diagnosis
- Construction and mechanism
- Practical exercises with TOOLBOX II and BC 1703 ACP

SICAM 1703 ACP and SICAM PAS – Workshop coupling configuration

Training objectives:

The merger of VA Tech SAT and Siemens Group has resulted in an immense increase of our product range and also of possible approaches. In various practical exercises, the participants work out together how the product lines SICAM PAS and SICAM 1703 ACP can be combined and applied in the most useful ways.

The training is intended for:

Technicians involved in the engineering of SICAM automation systems.

Recommended prior knowledge:

System knowledge SICAM 1703 ACP and SICAM PAS.

Main features:

- Overview of the utilized product range
- Possible configurations
- Creating a coupling of SICAM PAS and SICAM 1703 ACP systems with the use of interface reports
 - IEC 61850
 - IEC 60870-5-101
 - IEC 60870-5-104

IEC 60870-5-103 – Workshop configuration and application in SICAM 1703 ACP

Training objectives:

The participants acquire the skills necessary to configure an IEC 60870-5-103 interface in the SICAM 1703 ACP system. In the course, both master and slave are first configured and then tested with the training unit.

The training is intended for:

Protection and I&C specialists.

Recommended prior knowledge:

SICAM 1703 ACP system knowledge.

Main features:

- IEC 60870-5-103: overview of standards and reference to practical application
- Configuration with OPM II
- Commissioning and testing with TOOLBOX II
- Analysis with the report testing system

IEC 61850 – Workshop configuration and application in SICAM 1703 ACP

Training objectives:

The participants gain the skills necessary to configure an IEC 61850 interface in the SICAM 1703 ACP system. In the course, both client and server are first configured and then tested with a training unit. The course illustrates how a SIPROTEC protection device can be coupled with a SICAM 1703 ACP unit and how the data model is embedded in OPM via SCL file.

The training is intended for:

Protection and I&C specialists.

Recommended prior knowledge:

OPM II
SICAM 1703 ACP system knowledge
IEC 61850 standards

Main features:

- Configuration of an IEC 61850 interface in SICAM 1703 ACP
- Commissioning and testing with TOOLBOX II

Austria

Duration: 1 day
Code No.: 9CA4030-3JE00-0BB4
Language: English
Location: Vienna
Price: 490 EUR

Dates:
20.03.2009
15.05.2009

Contact:

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Austria

Duration: 2 days
Code No.: 9CA4030-3JE00-0BB3
Language: English
Location: Vienna
Price: 980 EUR

Dates:
on request

Contact:

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Austria

Duration: 1 day
Code No.: 9CA4030-3JE00-0BB5
Language: English
Location: Vienna
Price: 490 EUR

Dates:
on request

Contact:

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Fax: +43 51707-55243
E-mail:
power-academy.at@siemens.com

Austria

Duration: 1.5 days
Code No.: 9CA4030-3JE00-0BB6
Language: English
Location: Vienna
Price: 980 EUR

Dates:
26.03. - 27.03.2009
14.05. - 15.05.2009

Contact:

Monika Schuecker
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power-academy.at@siemens.com

Secondary Equipment – Substation Automation Systems

IEC 61850 – Workshop configuration and application in SIPROTEC

Training objectives:

The participants gain the skills necessary to configure an IEC 61850 interface in the SIPROTEC 4 system. In the seminar, SIPROTEC 4 devices will be configured and tested.

The training is intended for:

Protection and I&C specialists.

Recommended prior knowledge:

DIGSI 4, IEC 61850, CFC knowledge.

Main features:

- DIGSI 4: add new project, add new device, add IEC 61850 station
- Communication between SIPROTEC 4 devices using GOOSE
- New CFC modules
- Test tools (interface, GOOSE, data model)
- Practical use of IEC 61850
- Interlocking
- Protection-related functions
- Generating an SCD file
- Practical tips and tricks (using of xml interface, etc.)

IEC 60870-5-101/104 – Workshop configuration and application in SICAM 1703 ACP

Training objectives:

The participants acquire the skills necessary to configure an IEC 60870-5 interface in the SICAM 1703 ACP system.

The training is intended for:

I&C specialists.

Recommended prior knowledge:

SICAM 1703 ACP system knowledge

Main features:

- Overview of standard
- Most important data formats
- Configuration of commands
- IEC 104 redundancy
- Analysis
- IEC protocol test system

PROFIBUS and MODBUS – Workshop configuration and application in SICAM 1703 ACP

Training objectives:

The participant learns how to configure MODBUS and PROFIBUS protocols which are applicable in the target system SICAM 1703 ACP. In this seminar, the configuration is parameterized and tested with a training unit. Thereby the participant becomes familiar with the characteristics of the protocols.

The training is intended for:

I&C specialists.

Recommended prior knowledge:

Training "SICAM 1703 ACP – Configuration"

Main features:

- Overview of protocols
- Characteristics of the interfaces and the required hardware
- MODBUS configuration
- PROFIBUS configuration with SYCON

Disposal of fault signal records with SAT DISTO – Workshop configuration and application

Training objectives:

The participants learn to use fault data records with SAT DISTO fault signal records disposal. Particularly for reading out fault data records from protection devices of any kind that are coupled to a SICAM 1703 telecontrol network via IEC 60870-5-103. This seminar provides the basic concepts and system functions. The participants are able to configure the data flow of the SICAM 1703 components in order to transmit fault signal reports via a telecontrol network of several SICAM 1703 components.

The training is intended for:

Protection and I&C specialists.

Recommended prior knowledge:

SICAM 1703 ACP system knowledge
Basic knowledge of SICAM 230 or 250 SCALA

Main features:

- Installation of SAT DISTO
- Configuration of SICAM 230
- Configuration of SICAM 1703

Austria

Duration: 2 days
Code No.: 9CA4030-3JE00-0BB7
Language: English
Location: Vienna
Price: 980 EUR

Dates:
24.03. - 25.03.2009
12.05. - 13.05.2009

Contact:

Monika Schuecker
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Fax: +43 51707-55243
E-mail:
power-academy.at@siemens.com

Austria

Duration: 2 days
Code No.: 9CA4030-3JE0-0BB8
Language: English
Location: Vienna
Price: 980 EUR

Dates:
17.11. - 18.11.2008
18.05. - 19.05.2009

Contact:

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Fax: +43 51707-55243
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power-academy.at@siemens.com

Austria

Duration: 1 day
Code No.: 9CA4030-3JE00-0BC1
Language: English
Location: Vienna
Price: 490 EUR

Dates:
20.05.2009

Contact:

Monika Schuecker
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Fax: +43 51707-55243
E-mail:
power-academy.at@siemens.com

Austria

Duration: 1 day
Code No.: 9CA4030-3JE00-0BC2
Language: English
Location: Vienna
Price: 490 EUR

Dates:
on request

Contact:

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Phone: +43 51707-31143
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E-mail:
power-academy.at@siemens.com

Ax 1703 – Basic course for AK / AM / AMC 1703

Training objectives:

Participants will develop an understanding of the performance of the scalable Ax 1703 automation system; they will:

- comprehend the structure of Ax 1703
- understand the major functions of Ax 1703
- know the basic operating principle of Ax 1703

The training is intended for:

Technicians involved in the engineering of Ax 1703 systems and service technicians involved in the maintenance of Ax 1703 systems.

Recommended prior knowledge:

Knowledge of telecontrol basics.

Main features:

- Overview of the SICAM product families
- The scalable automation concept of Ax 1703
- The properties of the system components architecture, hardware, performance features of
- AM 1703 automation module
- AMC 1703 automation module
- AK 1703 automation module
- The operating principle of AK 1703 – from data acquisition to data output
- Diagnosis and test
- The integrated engineering tool TOOLBOX II

Ax 1703 – Service for AK / AM / AMC 1703

Training objectives:

Participants will learn to carry out the maintenance of the scalable automation system Ax 1703 (AK 1703 / AM 1703 / AMC 1703) by using the corresponding system tools. The course does not teach how to make modifications / expansions.

The training is intended for:

Technicians involved in the engineering of Ax 1703 systems and service technicians involved in the maintenance of Ax 1703 systems.

Recommended prior knowledge:

Course "Ax 1703 – Basic course".

Main features:

- System architecture and hardware overview
- SICAM TOOLBOX II basic handling
- Diagnosis
- Module replacement
- Connections, mechanics
- Remote maintenance
- Hands-on exercises with TOOLBOX II and AK 1703, AM 1703, AMC 1703

Ax 1703 – Configuration for AK / AM / AMC 1703

Training objectives:

Participants will be familiarized with the configuration steps for an Ax 1703 automation system (AK 1703, AM 1703, AMC 1703) from the definition of the system-specific layout to the test. The course does not include the planning of system configurations. The course's focus is on the automation component AK 1703; but it also contains the parameterization steps which are common to the Ax-system family for AM / AMC 1703.

The training is intended for:

Technicians involved in the engineering of Ax 1703 systems.

Recommended prior knowledge:

Course "Ax 1703 – Basic course", "Ax 1703 – Service" and "OPM II – Basic course".

Main features:

- Addressing of system components and data
- Assembling an automation unit
- Parameterizing system functions
 - Communication
 - Periphery
 - Optional with OPM II
- Configuring the data flow
- Test using TOOLBOX II
- Parameter management on TOOLBOX II: Import / export / backup
- Overview of system concepts
- Hands-on exercises with TOOLBOX II and AK 1703, AM 1703, AMC 1703

Ax 1703 – CAEx II Configuration

Training objectives:

Computer-aided configuration of automated sequences in technological processes with the software package CAEx. Participants will learn to master CAEx, basic principles of sequence control, logic control and controller configurations.

The training is intended for:

Technicians involved in the engineering of Ax 1703 systems.

Recommended prior knowledge:

Basic knowledge of digital circuit engineering and the automation system.

Main features:

- System operation
- Function chart fundamentals
- Creating function charts:
 - Module
 - Macro / subroutine technology
 - Function chart organization
 - Documentation creation
- Simulation
 - Test principles
 - Breakpoints
 - Displaying analog / digital signal responses
 - Creating test patterns

Austria

Duration: 2 days
Code No.: 9CA4030-3JE00-0BC3
Language: English
Location: Vienna
Price: 980 EUR

Contact:

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 E-mail:
 power-academy.at@siemens.com

Austria

Duration: 2 days
Code No.: 9CA4030-3JE00-0BC4
Language: English
Location: Vienna
Price: 980 EUR

Contact:

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 Fax: +43 51707-55243
 E-mail:
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Austria

Duration: 3 days
Code No.: 9CA4030-3JE00-0BC5
Language: English
Location: Vienna
Price: 1,470 EUR

Contact:

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 Fax: +43 51707-55243
 E-mail:
 power-academy.at@siemens.com

Austria

Duration: 2.5 days
Code No.: 9CA4030-3JE00-0BC6
Language: English
Location: Vienna
Price: 1,250 EUR

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 power-academy.at@siemens.com

Ax 1703 – CAEx II Implementation

Training objectives:

This course enables its participants to create a control program that is executable on the AK 1703 system component.

The training is intended for:

Technicians involved in the engineering of Ax 1703 systems.

Recommended prior knowledge:

Course "Ax 1703 – CAEx II Configuration", "Ax 1703 – Service for AK AM / AMC 1703" and "Ax 1703 – Configuration for AK / AM / AMC 1703".

Main features:

- Operating principle of the control system
- Defining an overall control program consisting of several function charts created separately in CAEx (task sharing)
- Data configuration for the open / closed loop control module
- Documentation creation
- Loading the overall program on the open / closed loop control module in AK 1703
- Test and diagnosis in online mode



Austria

Duration: 1.5 days
Code No.: 9CA4030-3JE00-0BC7
Language: English
Location: Vienna
Price: 980 EUR

Dates: 17.12. - 19.12.2008

Contact:
 Monika Schuecker
 Phone: +43 51707-31143
 Fax: +43 51707-55243
 E-mail:
 power-academy.at@siemens.com

Telecontrol VICOS RTU

Training objectives:

The participants learn about the conceptual design, the structure and application of the VICOS RTU system functions, parameterization, startup and analysis, and diagnosis and elimination of faults using the system diagnostics.

The training is intended for:

The training is intended for system caretakers who are responsible for configuring and maintaining VICOS RTU telecontrol systems.

Recommended prior knowledge:

Basic knowledge of SIMATIC S7-300

Main features:

- The course focuses the following points:
 - Introduction to VICOS RTU
 - Configuration options
 - General introduction into the applied hardware and software
 - Configuration of VICOS RTU – SIMATIC S7 Manager
 - Configuration of VICOS RTU – VICOS RTU Parameterization tool ParaM
 - Parameterization of a telecontrol link (with SIMATIC Manager and ParaM)
 - Input of the parameterization into the telecontrol unit
 - Connection of the diagnostic tool as system control center
 - Testing of the parameterization
 - System analysis by means of the diagnosis tool Fink and the SIMATIC Manager
 - Failure analysis with VICOS RTU



Germany

Duration: 3 days
Code No.: 9CA4030-0JE00-0BF8
Language: English
Location: Erlangen-Tennenlohe
Price: 2,016 EUR

Dates: 16.06. - 18.06.2009

Contact:
 Carmen Davis
 Phone: +49 911 433-8008
 Fax: +49 911 433-7929
 E-mail:
 carmen.davis.ext@siemens.com

Application and practice of numerical recording system SIMEAS R

Training objectives:

The participants will acquire extensive basic knowledge of the systems SIMEAS R and OSCOP P. They will learn the issues of system perturbations and power system quality and will know the corresponding recording systems. Furthermore, they will learn to evaluate and interpret the indicated power system data on the basis of typical application examples.

The training is intended for:

Employees in power generation, transmission and industrial operations, and technically interested people.

Recommended prior knowledge:

Basics of electrical engineering.

Main features:

- SIMEAS R: device hardware; scope of functions; commissioning and complete parameterizing
- Communication, system hardware, system function and concept of DAKON
- Recording system SIMEAS R to detect power system perturbations (such as short circuits) and to evaluate power quality
- Average-value recorders, voltage dips, flicker, binary recorder, power and frequency recorder
- Overview of OSCOP P: parameterizing of PC and devices, transfer and evaluation of recorded data
- Application and practice of OSCOP P and SIMEAS R as well as application examples
- Analyzing faults in power plants by means of power and frequency recorders
- Interpreting and analyzing power system faults and power quality data



Germany

Duration: 3 days
Code No.: 9CA4030-0KE00-0BA4
Language: English
Location: Nuremberg
Price: 1,985 EUR

Dates: 19.01. - 21.01.2009
 28.09. - 30.09.2009

Contact:
 Isabell Siskov
 Phone: +49 911 433-7005
 Fax: +49 911 433-7929
 E-mail:
 isabell.siskov@siemens.com

Application and practice of systems SIMEAS Q, P and T

Training objectives:

The participants will acquire extensive knowledge of the systems SIMEAS Q, as well as power meter SIMEAS P and measurement transducer system SIMEAS T. They will learn to evaluate and interpret the indicated power system data on the basis of typical application examples.

The training is intended for:

Employees in power generation, transmission and industrial operations, and technically interested people.

Recommended prior knowledge:

Basics of electrical engineering.

Main features:

- "Power Quality" in Europe – Standard EN 50160 and IEC 61000 4-7; 4-15; 4-30
- Different use of fault recorders and average-value recorders in industrial applications
- Monitoring the power system voltage with average value recorders
- Use of compact recorders to monitor power system quality
- Operation and parameterizing with the systems SIMEAS T, SIMEAS P, SIMEAS Q and application of evaluation software SICARO PQ



Germany

Duration: 2 days
Code No.: 9CA4030-0KE00-0BA5
Language: English
Location: Nuremberg
Price: 1,325 EUR

Dates: 22.01. - 23.01.2009
 01.10.- 02.10.2009

Contact:
 Isabell Siskov
 Phone: +49 911 433-7005
 Fax: +49 911 433-7929
 E-mail:
 isabell.siskov@siemens.com

General Functional Survey Spectrum PowerCC

Training objectives:

The training participants will get an overview about the hardware requirements and the main software functions of the system.

The training is intended for:

- Sales
- Marketing

Recommended prior knowledge:

Basic knowledge of MS Windows 2000/2003
Basic knowledge of power systems control

Main features:

- The course introduces the following topics:
 - Concept for hardware and redundancy
 - Licenses
 - SCADA – Operating and monitoring (context management)
- On the second day, the following topics can be addressed:
 - Fault location, service restoration, power flow
 - Load management electricity
 - Load forecast gas
 - Distribution networks applications Crew management (CM) Outage Management (OMS), Trouble call system (TCS)
 - Supply management water
 - Overview data entry with IMM
- This course consists of lectures, demonstrations and practical exercises

SICAM 230 V 6.x – Configuration

Training objectives:

The participants are able to work with the new Designer (Editor) of SICAM 230 Version 6.x. They will carry out SICAM 230 project changes and expansions themselves. In this seminar, a new SICAM 230 project will be started. Thereby the major features of SICAM 230 will be explained. As a functional protect will be realized, also the interface to SICAM 1703 will be explained. This project may serve as the basis for the participants respective projects.

The training is intended for:

Protection and I&C specialists.

Recommended prior knowledge:

Course "SICAM ACP 1703 – OPM II Basic course".

Main features:

- Overview of SICAM 230 V 6.x
- The new Designer (Editor)
- Project creation
- Data point parameterization
- Display construction
- Alarm function
- Practical exercises
- Use of user documentation
- Graphical topology
- Communication interface via IEC 60870-5-101/104 and IEC 61850

SICAM 230 V 6.x CE – Workshop configuration and application

Training objectives:

The participants know the process-specific adaption of the pre-configured touch panel and will be able to integrate

- new plant displays
- additional process data representations

They will be able to assess the feasibility of new requirements and to fulfill them within the defined system.

The training is intended for:

Protection and I&C specialists.

Recommended prior knowledge:

Course "SICAM 230 V 6.x Configuration".

Main features:

- Differences between PC and CE platform
- Configuration and installation of SICAM 230 CE touch panel
 - Remote transport
- Special features of the SICAM 230 CE touch panel
 - Recommendation
 - Testing possibilities

SICAM 230 Network management – Workshop configuration and application

Training objectives:

The SICAM network manager NWM 230 is a solution for monitoring active network components integrated into automation and control systems – especially made for communication processes in LANs and WANs. Its main tasks are

- rapid diagnosis and error detection in times of critical network problems
- effective monitoring of redundant network components
- automatic alarming in case of error
- continuous monitoring and statistical evaluation of the network performance

In the course, the participant learns the practical application of the network manager.

The training is intended for:

Protection and I&C specialists.

Recommended prior knowledge:

Part 1: Basic network knowledge

Course "SICAM 230 Network management – Workshop configuration and application" Part 1

Main features:

Part 1 – Overview and basics

This course gives an overview of the necessity, requirements and performance characteristics of integrated network management in the field of automation and demonstrates the basics. Focus group is technical decision-makers, planners and engineers of LAN / WAN networks in the field of automation.

Part 2 – Workshop

Practical knowledge of configuring a network management system. Focus group is engineers who want to apply network management in control center systems.



Germany

Duration: 3 days
Code No.: 9CA4080-0UE00-OHA1
Language: English
Location: Erlangen-Tennenlohe
Price: 2,016 EUR

Dates: 14.07. - 16.07.2009

Contact:
Carmen Davis
Phone: +49 911 433-8008
Fax: +49 911 433-7929
E-mail:
carmen.davis.ext@siemens.com



Austria

Duration: 4 days
Code No.: 9CA4030-3JE00-0BD3
Language: English
Location: Vienna
Price: 1,960 EUR

Dates: 09.12. - 12.12.2008
16.03. - 19.03.2009
11.05. - 14.05.2009

Contact:
Monika Schuecker
Phone: +43 51707-31143
Fax: +43 51707-55243
E-mail:
power-academy.at@siemens.com



Austria

Duration: 1 day
Code No.: 9CA4030-3JE00-0BD4
Language: English
Location: Vienna
Price: 490 EUR

Date: 20.03.2009

Contact:
Monika Schuecker
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Fax: +43 51707-55243
E-mail:
power-academy.at@siemens.com



Austria

Duration: 1 day
Code No.: 9CA4030-3JE00-0BD5
Language: English
Location: Vienna
Price: 490 EUR

Dates: on request

Contact:
Monika Schuecker
Phone: +43 51707-31143
Fax: +43 51707-55243
E-mail:
power-academy.at@siemens.com

250 SCALA Configuration and operation

Training objectives:

The participant can handle the process-specific adaptation of a pre-configured control center system SAT 250 SCALA. According to the set targets, he / she can integrate

- new plant displays
- additional process data displays

The participant is able to assess whether new requirements can be implemented. He / she can fulfill such requirements within the defined limits of the system.

The training is intended for:

Protection and I&C specialists.

Recommended prior knowledge:

Course "SICAM 1703 ACP – OPM II Basic course".

Main features:

- Operation
- Image design
- Object-oriented data point configuration
- Object-oriented pixel configuration
- Handling of alarms
- Lists
- Graphs: function and operation
- Data back-up
- MS Excel coupling
- Possible configurations
- Short overview of higher functions
- Practical exercises

 Austria

Duration: 4 days

Code No.: 9CA4030-3JE00-0BD6

Language: English

Location: Vienna

Price: 1,960 EUR

Dates:

09.12. - 12.12.2008

Contact:

Monika Schuecker

Phone: +43 51707-31143

Fax: +43 51707-55243

E-mail:

power-academy.at@siemens.com

Digital excitation system Siemens E F IE 18

Training objectives:

The participants receive a short introduction to static and brushless excitation systems. Basic knowledge is communicated, which is necessary for the sale of excitation systems and for commissioning engineers.

The training is intended for:

Sales staff and engineers which need a basic description of the different excitation systems.

Recommended prior knowledge:

Basic knowledge of synchronous machines.

Main features:

- Basics of synchronous machines and excitation systems
- Overview of static and brushless excitation systems
- Examples of THYRIPOL®, RG3 and DIGUREG excitation systems
- Power System Stabilizer (PSS)
- Possibilities during retrofit of existing systems and possibilities for new projects – real example of retrofit RG2 to RG3
- Acting of limiters in excitation systems in combination with protection systems – real examples

Brushless excitation systems RG3

Training objectives:

The basic knowledge about excitation systems is communicated. The brushless excitation system is discussed more detailed. Technical description and possibilities for retrofit is communicated.

The training is intended for:

Sales staff, engineers and commissioning engineers for brushless excitation systems with the wish for a better acknowledge about brushless excitation systems.

Recommended prior knowledge:

Course "Digital excitation system Siemens E F IE 18".

Main features:

- Overview of static and brushless excitation systems
- Brushless excitation systems RG3 – technical details
- Possibilities during retrofit of existing systems and possibilities for new projects – real example of retrofit RG2 to RG3
- Advantages of retrofit – example on real project
- Acting of limiters in excitation systems in combination with protection systems – real examples

Note:

The course will be executed with support of the Technical Department for Customized Excitation Systems.

Static excitation systems THYRIPOL®

Training objectives:

The basic knowledge about excitation systems is communicated. The static excitation system is discussed more detailed. Technical description and possibilities for retrofit is communicated.

The training is intended for:

Sales and electrical engineers and commissioning engineers for brushless excitation systems with the wish for a better acknowledge about static excitation systems.

Recommended prior knowledge:

Course "Digital excitation system Siemens E F IE 18".

Main features:

- Overview of static and brushless excitation systems
- Static Excitation Systems THYRIPOL® – technical details
- Possibilities during retrofit of existing systems and possibilities for new projects
- Advantages of retrofit
- Acting of limiters in excitation systems in combination with protection systems – real examples

Note:

The course will be executed with support of the Technical Department for Customized Excitation Systems.

Commissioning of static and brushless excitation systems

Training objectives:

To understand and to be able to test an excitation system. Commissioning of excitation systems.

The training is intended for:

Commissioning engineers, service staff.

Recommended prior knowledge:

Course "Brushless excitation systems RG3" and / or "Static excitation systems THYRIPOL®".

Main features:

- Software installation and operation
- Documentation for commissioning engineers
- Possibilities during retrofit of existing systems
- Practical part on training cubicle in closed-loop circuit
- Instructions for commissioning, tips and tricks
- Acting together with generator protection
- Technique: RG3, RG3 with DIGUREG or THYRIPOL® with SIMOREG

Note:

The course will be executed with support of the Technical Department for Customized Excitation Systems.



Germany

Duration: 1.5 days
Code No.: 9CA4090-0WE00-OLA1
Language: English
Location: Erlangen
Price: 1,105 EUR

Contact:
Carmen Davis
Phone: +49 911 433-8008
Fax: +49 911 433-7929
E-mail:
carmen.davis.ext@siemens.com



Germany

Duration: 2 days
Code No.: 9CA4090-0WE00-OLA2
Language: English
Location: Erlangen
Price: 1,510 EUR

Contact:
Carmen Davis
Phone: +49 911 433-8008
Fax: +49 911 433-7929
E-mail:
carmen.davis.ext@siemens.com



Germany

Duration: 2 days
Code No.: 9CA4090-0WE00-OLA3
Language: English
Location: Erlangen
Price: 1,510 EUR

Contact:
Carmen Davis
Phone: +49 911 433-8008
Fax: +49 911 433-7929
E-mail:
carmen.davis.ext@siemens.com



Germany

Duration: 2 days
Code No.: 9CA4090-0WE00-OLA4
Language: English
Location: Erlangen
Price: 1,510 EUR

Contact:
Carmen Davis
Phone: +49 911 433-8008
Fax: +49 911 433-7929
E-mail:
carmen.davis.ext@siemens.com

Siemens Industry Automation Training

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Contact

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or let us provide you with individual advice. Please ask for our training catalog:

Course Office, Infoline Germany:

Tel.: +49 (0)1805 235611 (0.12 €/min)

Fax: +49 (0)1805 235612

Training topics at SITRAIN

Drive engineering

- AC converters
- DC converters: SIMOREG

Automation systems / Totally Integrated Automation

- SIMATIC industrial automation systems
- PC-based automation / Embedded automation
- SIMATIC HMI operation and monitoring systems
- Transportation systems
- Mechatronic qualification system

CNC automation systems and motion control

- SIMOTION motion control system
- SINUMERIK CNC automation systems

Industrial communication

- SIMATIC NET communications systems

Process automation

- Process analytics
- SIMATIC PCS 7 process control system
- Control room equipment

Safety engineering – Safety Integrated

- SIMATIC S7 H / F / FH systems
- SINUMERIK CNC automation systems
- Electromagnetic compatibility
- SIGUARD safety technology

Low-voltage switchgear / Totally Integrated Power

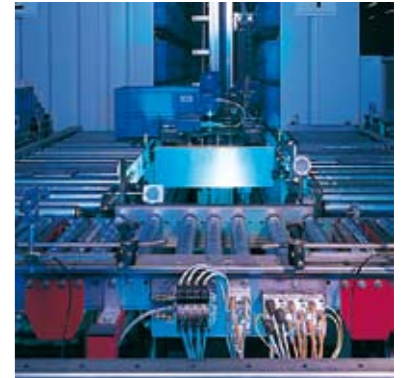
- SIRIUS industrial switchgear
- Low-voltage power distribution

Sensor technology, measuring and testing systems

- Image processing systems
- RFID systems
- Safety sensors

Electrical installation engineering

- Product training
- KNX / EIB system training



Registration form

for Siemens Power Academy TD in USA

Registration by fax/e-mail

Siemens Power
Transmission & Distribution, Inc.
Siemens Power Academy TD
Schenectady, NY

Phone: +1 518 395-5039
Fax: +1 518 346-2777
E-mail: pti-edpro.ptd@siemens.com

Sender _____
Company _____
Name _____
Department _____
Location _____
Phone _____
Fax _____
E-mail _____
Your reference _____
Our sign _____
Date _____

ORG-ID and order number (please state)

We register the following participant(s) to the training mentioned below:

Customer

Company _____

Street _____

Location _____

Name(s) _____

Training

Code No. _____

Training title _____

Employee

Location _____

Department _____

Name(s) _____

Date _____

AWV identification _____

Note _____

The general conditions for trainings at Siemens Power Academy TD (according to catalog / Internet) are known and accepted by us.

Name in capitals

Signature

Registration form

for Siemens Power Academy TD in UK

Registration by fax/e-mail

Siemens Transmission & Distribution
Limited
Siemens Power Academy TD
Hebburn, UK

Phone: +44 191 495-3449
Fax: +44 191 495-3693
E-mail: phil.letouze@siemens.com
www.siemens.com/power-technologies

Sender _____
Company _____
Name _____
Department _____
Location _____
Phone _____
Fax _____
E-mail _____
Your reference _____
Our sign _____
Date _____

ORG-ID and order number (please state)

We register the following participant(s) to the training mentioned below:

Customer

Company _____

Street _____

Location _____

Name(s) _____

Training

Code No. _____

Training title _____

Employee

Location _____

Department _____

Name(s) _____

Date _____

AWV identification _____

Note _____

Reservation of a hotel: yes no

Arrival/Departure _____

The general conditions for trainings at Siemens Power Academy TD (according to catalog / Internet) are known and accepted by us.

Name in capitals

Signature

Registration form

for Siemens Power Academy TD in Germany and France

Registration by fax/e-mail

Siemens AG

Siemens Power Academy TD
Nuremberg

Phone: +49 911 433-7416 / 7533 / 7005

Fax: +49 911 433-7929

E-mail: power-academy.ptd@siemens.com

Sender _____
Company _____
Name _____
Department _____
Location _____
Phone _____
Fax _____
E-mail _____
Your reference _____
Our sign _____
Date _____

ORG-ID and order number (please state)

We register the following participant(s) to the training mentioned below:

Customer

Training

Company _____

Code No. _____

Street _____

Training title _____

Location _____

Name(s) _____

Employee

Location _____

Date _____

Department _____

AWV identification _____

Name(s) _____

Note _____

Reservation of a hotel: yes no

Arrival/Departure _____

The general conditions for trainings at Siemens Power Academy TD (according to catalog / Internet) are known and accepted by us.

Name in capitals

Signature

Registration form

for Siemens Power Academy in Austria

Registration by fax/e-mail

Siemens AG

Siemens Power Academy TD
Vienna

Phone: +43 51707 31143

Fax: +43 51707 55243

E-mail: power-academy.at@siemens.com

Sender _____
Company _____
Name _____
Department _____
Location _____
Phone _____
Fax _____
E-mail _____
Your reference _____
Our sign _____
Date _____

ORG-ID and order number (please state)

We register the following participant(s) to the training mentioned below:

Customer

Training

Company _____

Code No. _____

Street _____

Training title _____

Location _____

Name(s) _____

Employee

Location _____

Date _____

Department _____

AWV identification _____

Name(s) _____

Note _____

Reservation of a hotel: yes no

Arrival/Departure _____

The general conditions for trainings at Siemens Power Academy TD (according to catalog / Internet) are known and accepted by us.

Name in capitals

Signature

General terms and conditions for training at Siemens Power Academy TD in USA (SPT&D PTI)



1. Registration

Applications to attend courses must be submitted in writing or electronically using the registration form (under registration). Registrations imply or recognize our SPT&D PTI General Terms and Conditions for Training.

2. Acknowledgement of registration

We shall send you confirmation of the requested training course, course dates and fee, or, if there are no vacancies for the dates you have requested, we send an acknowledgement in the form of a provisional notification giving alternative dates. You should notify us within 14 days if you are unable to attend on the suggested alternative date. If we do not hear from you within the specified time frame, we shall assume that you have accepted the dates we have proposed.

3. PTD SE PTI services

Our services comprise

- running training courses
- providing documentation accompanying the training
- providing the requisite materials and resources
- issuing a certificate of attendance. Certificates of attendance are only issued, however, if participants attend at least 80% of the training course.

Training course descriptions are accurate at the time they are issued. We reserve the right to change, adapt or develop course contents to reflect the current state of the art and course contents may, as a result, deviate from those specified in course descriptions.

4. Prices and terms of payment

Training course prices are specified in the descriptions in the catalog / our web site. Catalog prices do not include the cost of accommodation and travel. The scope of services and price of customized training courses are specified in the offer.

The statutory rate of value-added tax shall be added to all prices quoted. In case an acceptable tax exemption certificate is submitted, taxes will not be due based on the State or Country.

Upon registration of the training course, participants will be issued an invoice which shall be due for settlement within 30 days upon receipt of the invoice or due prior to the course date which ever is earlier with no deduction. Payment may be made by wire transfer, check or credit card (only VISA, AMEX, and MasterCard). Siemens internal participants shall be invoiced by way of internal procedures on internal company terms and conditions.

5. Cancellations by registered participants

Registered participants shall be entitled to nominate alternative participants prior to the commencement of the training course.

We shall charge the confirmed prices for registered and confirmed course places even in the case of non-attendance. Course places may be cancelled in writing at no charge up to 21 days before the training course begins. 50% of the price of the training course will be charged for cancellations received up to 14 days before the course begins. The full price will be charged for all cancellations received later than 14 days prior to the start of the course. The cancellation date is the date of receipt of a written cancellation by SPT&D PTI.

6. Copyright

Written course materials may not be reproduced for any purpose without the consent of SPT&D PTI and may only otherwise be used for purposes explicitly authorized by SPT&D PTI. Siemens software used or provided for the purpose of conducting the training course may not be

removed, nor copied (neither in whole nor in part), nor used in any other unauthorized way. No video recording or sound recording is permitted.

7. Safety regulations

Course participants shall comply with all safety and accident-prevention regulations in force on Siemens' premises. They shall also be bound by all other applicable rules, particularly those concerning access.

8. Liability

All technical information provided in the courses and in the training documentation is correct to the best of our knowledge. No liability shall be assumed for the accuracy (e.g. exclusion of printing errors) of the information provided in the course or in the training documents.

SPT&D PTI and Client agree that the services provided for herein will be performed in accordance with recognized professional consulting/ education standards for the same or similar services. Both parties acknowledge that utilization of the educational seminar material depends upon many factors not within the control of SPT&D PTI. As such, and notwithstanding any other provision to the contrary in this Agreement, SPT&D PTI's total aggregate liability to you for damages suffered by you under this Agreement shall be limited to 100% of the amount of the fees for services received by SPT&D PTI from you under this Agreement. In no event shall SPT&D PTI, its parent corporation, or its or their affiliates, agents, employees, or others providing materials or performing services in connection with this Agreement be liable for any other direct, or for any indirect, incidental, consequential or special loss or damage, whether attributable to breach of contract, warranty, express or implied, tort, including negligence, strict liability, or otherwise. Except as herein provided, you release SPT&D PTI, its parent corporation and its and their affiliates, agents, employees, or others providing materials or performing services in connection with this Agreement from and against any and all liability, as well as costs of defense, settlement and reasonable attorney's fees, irrespective of fault or negligence.

9. Reservation of right of modification

We reserve the right to change the location of training courses and/or to postpone and, for justifiable reasons (such as too few participants or if the instructor is ill), to cancel courses or to assign a different speaker/instructor. Payment claims lapse if a course is cancelled. If the location or time of the course is changed, the registered participant is entitled to cancel his or her registration in writing within 3 working days of receipt of such notice of change. All other claims for substitution, damages or losses are excluded.

10. Export controls

The training contract and execution of the contract are subject to the condition that the required export licenses are issued; performance may be barred by export regulations applicable in USA or other countries.

11. Applicable law, legal venue

This Agreement is subject to substantive law of the State of New York to the exclusion of the United Nations Convention on the International Sale of Goods. The legal venue for registered traders is New York.

12. Written form

The parties agree that all agreements shall be made in writing. This written-form requirement may likewise only be waived in writing.

Siemens Power Academy TD, July 2008

General terms and conditions for training at Siemens AG Austria Siemens Power Academy TD (Vienna)



1. Registration

Applications to attend courses must be submitted in writing or electronically using the registration form or by phone, Mrs. Figiel, Phone 051707 / 31143. Registrations imply recognition of our Siemens Power Academy TD General Terms and Conditions for Training.

2. Acknowledgement of registration

We shall send you confirmation of the requested training course, course dates and fee, or, if there are no vacancies for the dates you have requested, we send an acknowledgement in the form of a provisional notification giving alternative dates. You should notify us within 14 days if you are unable to attend on the suggested alternative date. If we do not hear from you within the specified time frame, we shall assume that you have accepted the dates we have proposed.

3. Siemens Power Academy TD services

Our services comprise

- running training courses
- providing documentation accompanying the training
- providing the requisite materials and resources
- issuing a certificate of attendance. Certificates of attendance are only issued, however, if participants attend at least 80% of the training course.

Training course descriptions are accurate at the time they are issued. We reserve the right to change, adapt or develop course contents to reflect the current state of the art and course contents may, as a result, deviate from those specified in course descriptions.

4. Prices and terms of payment

Training course prices are specified in the descriptions in the catalog. Catalog prices do not include the cost of accommodation and travel. The scope of services and price of customized training courses are specified in the offer.

The statutory rate of value-added tax shall be added to all prices quoted.

Upon completion of the training course, participants will be issued an invoice which shall be due for settlement within 30 days with no deduction. Siemens internal participants shall be invoiced by way of Siemens – internal procedures on internal company terms and conditions.

5. Cancellations by registered participants

Registered participants shall be entitled to nominate alternative participants prior to the commencement of the training course.

We shall charge the confirmed prices for registered and confirmed course places even in the case of non-attendance. Course places may be cancelled in writing at no charge up to 28 days before the training course begins. 50% of the price of the training course will be charged for cancellations received up to 14 days before the course begins. The full price will be charged for all cancellations received later than 14 days prior to the start of the course. Decisive for the cancellation dates is the date of receipt of a written cancellation by Siemens Power Academy TD.

6. Copyright

E TD SE PTI reserves all rights in the course materials. In particular, written course materials may not be reproduced for any purpose without the consent of Siemens Power Academy TD and may only otherwise be used for purposes explicitly authorized by Siemens Power Academy TD.

Siemens software used or provided for the purpose of conducting the training course may not be removed, nor copied (neither in whole nor in part), nor used nor distributed in any other unauthorized way.

No video recording or sound recording is permitted.

7. Safety regulations

Course participants shall comply with all safety and accident-prevention regulations in force on Siemens' premises. They shall also be bound by all other applicable rules, particularly those concerning access.

8. Liability

All technical information provided in the courses and in the training documentation is correct to the best of our knowledge. No liability shall be assumed for the accuracy (e.g. exclusion of printing errors) of the information provided in the course or in the training documents. Siemens E TD SE PTI does not warrant that the training will achieve any particular result.

Siemens Power Academy TD shall be liable for personal injuries caused by Siemens Power Academy TD in accordance with statutory provisions. Siemens Power Academy TD shall be liable for property damage caused by Siemens and shall pay compensation, not exceeding 25,000 Euros per instance of damages, to cover the costs of reversing such damage. In the event of damage to data carrier material, the duty to replace shall not include the cost of restoring lost data. Claims for damages other than those explicitly referred to in these terms and conditions, in particular all consequential damages, are excluded unless liability is cogent.

If events are held on the premises or grounds of third parties, Siemens Power Academy TD shall not be liable to participants in the event of accidents, nor for loss of or damage to participants' property, unless such damage has been caused by Siemens Power Academy TD or its employees.

We explicitly remind you that only in exceptional cases Siemens Power Academy TD issues invitation letters for participants which may be needed for the issuance of a single entry visa by the Austrian embassy. If Siemens Power Academy TD is charged for any costs arising from its obligations due to this invitation letter by a third party (in particular the Republic of Austria, its federal states or communities) Siemens Power Academy TD will pass on these costs to you. You therefore undertake to indemnify Siemens Power Academy TD against any and all possible claims arising from such an invitation letter.

9. Reservation of right of modification

We reserve the right to change the location of training courses and/or to postpone and, for justifiable reasons (such as too few participants or if the instructor is ill), to cancel courses or to assign a different speaker/instructor. Payment claims lapse if a course is cancelled. If the location or time of the course is changed, the registered participant is entitled to cancel his or her registration in writing within 3 working days of receipt of such notice of change. All other claims for substitution, damages or losses are excluded.

10. Export controls

The training contract and execution of the contract are subject to the proviso that the required export licenses are issued; performance may be barred by export regulations applicable in Austria or other countries.

11. Applicable law, legal venue

Any litigations arising under the contract including litigations over the existence or non-existence thereof shall fall within the exclusive jurisdiction of the competent court in Vienna, Innere Stadt. The contract is subject to Austrian law excluding the referral rules. Application of the UN Convention on Contracts for the International Sale of Goods is renounced.

Written form

The parties agree that all agreements shall be made in writing. This written-form requirement may likewise only be waived in writing.

Siemens Power Academy TD, July 2008



General conditions of contract for services at Siemens Transmission and Distribution Ltd. (UK)

1. Scope

These terms and conditions shall apply to trainings, courses, workshops, seminars and similar events delivered by Siemens Transmission and Distribution Limited, through the business area known as Power Technologies International (PTI), the provider of network consulting, software solutions and T&D training in the Siemens Energy Sector (hereinafter referred to as "PTI").

2. Course registration

PTI shall provide you with a quotation outlining the training courses or other services to be provided to you and the price for providing the Services (hereinafter referred to as the "Price"). Upon your acceptance of the quotation, PTI shall send you a confirmation of the requested Services, date/s for provision of the Services and location of same.

You must notify PTI within 14 days if you are unable to attend on the suggested date/s. If PTI does not hear from you within the time frame specified in the notification, PTI shall assume that you have accepted the dates PTI has proposed.

3. Condition precedent – Export control regulations

Prior to provision of the Services, you shall provide to PTI the following details:

- a) full name and nationality of each participant/attendee attending the course,
- b) the site and country in which the participant/attendee is based, and where they will be applying the knowledge gained from the Services,
- c) the industry in which the participant/attendee works and the purpose for which the Services are required, and
- d) whether or not the training is required for a defence or military-related application.

It shall be a condition precedent of this contract that the above details are provided to PTI and that PTI are of the opinion, upon verifying such details, that no export control requirements will be contravened by the provision of the Services to you.

If PTI are of the opinion that export control requirements will or may be contravened by the provision of the Services to you, PTI shall have the right to cancel, in whole or in part, the Services, without any liability to you.

Where goods are provided as part of delivery of the Services, goods labelled with "AL not equal to N" are subject to European or German export authorization when being exported out of the EU. Goods labelled with "ECCN not equal to N" are subject to US re-export authorization. Even without a label, or with label "AL:N" or "ECCN:N", authorization may be required due to the final end-use and destination for which the goods are to be used.

4. PTI's services

PTI's services comprise of conducting training courses or such other services as are outlined in the quotation provided to you (hereinafter referred to as the "Services").

Certificates of attendance shall be issued to course participants, provided that participants attend at least 80% of the training course. Training course descriptions are accurate at the time they are issued. PTI reserves the right to change, adapt or develop course contents to reflect the current state of the art and course contents may, as a result, deviate from those specified in course descriptions.

Unless otherwise specified in our quotation, PTI's services do not include accommodation, transport and supervision of the participants' attendance. Upon your request, accommodation for the participants may be arranged. In that case, such associated charges shall be borne by you.

5. Prices, fees and terms of payment

The Price for the Services shall be as specified in the attached quotation. The statutory rate of value-added tax shall be added to the Price upon invoicing.

Upon completion of the training course, participants will be issued an invoice which shall be due for settlement within 30 days without deduction. Internal participants shall be invoiced by way of internal procedures on internal company terms and conditions.

6. Cancellations by registered participants

Registered participants shall be entitled to nominate alternative participants prior to the commencement of the training course. Unless otherwise stated, course places may be cancelled at no charge, providing that your written notice of cancellation is received more than 21 days before the training course begins. 50% of the Price of the training course will be payable when your written notice of cancellation is received less than 21 but more than 14 days before the course begins. The Price in full will be payable for all cancellations received less than 14 days prior to the start of the course. Notice of cancellation will only be effective from date of receipt of your written confirmation by PTI.

In the case of non-attendance, in the absence of an appropriate cancellation notification as above, PTI shall be entitled to the Price of confirmed course places, where these are applicable.

7. Copyright

Written course materials provided to participants may not be reproduced for any purpose without the consent of PTI and may only otherwise be used for purposes explicitly authorized by PTI. Software of any of the company of the Siemens Group used or provided for the purpose of conducting the training course may not be removed, nor copied (neither in whole nor in part), nor used in any other unauthorized way. No video recording or sound recording is permitted. PTI reserves all rights to the documents, teaching materials and, if applicable, the software for each respective training. These regulations also apply if documents of a third party are used and also to all information relayed orally during the training by the training leader.

8. Safety regulations

Course participants shall comply with all safety and accident prevention regulations applicable to Siemens' premises or such other alternative location/s. They shall also be bound by all other applicable rules, particularly those concerning access. In case of non-observance or non-compliance, PTI is entitled to expel the participant from the training for the remainder of its duration. In this case, the price for the training will have to be settled in full.

9. Liability

All technical information provided in the courses and in the training documentation is correct to the best of PTI's knowledge. No liability shall be assumed for the typographical errors or other errors of that type appearing in any written information provided in the course, or in the training documents.

Save in relation to death or personal injury, PTI's liability to you shall be only limited to property damage caused by PTI and PTI's liability in this regard shall not exceed the £10,000. In the event of damage to data carrier material, the duty to replace shall not include the cost of restoring lost data. Save as otherwise stated herein, PTI shall not be liable whether in contract, tort or any other legal or equitable theory, for any claims for stoppages, loss of profits, loss of data, loss of contract, loss of use or for any indirect or consequential damages. Claims for damages shall be limited to reasonably foreseeable damages only, unless such damages are due to intentional acts or gross negligence of PTI. If events are held on the premises of third

parties, PTI shall not be liable to participants in the event of accidents, nor for loss of or damage to participants' property, unless such injury or damage has been caused by PTI.

PTI shall not be liable if a participant does not handle or otherwise use the information obtained through the training or the training material with the necessary expert knowledge and thereby causes damage of any kind. PTI cannot be held liable for technical developments which overtake or invalidate the material used during the training, if they occur between the creation of the training material and the beginning of the training and they could not have been known or identified prior to creation of the training material.

10. Force Majeure

Neither party shall be liable to the other to the extent that performance of the contract is rendered impossible, substantially more difficult or expensive, or is prevented or delayed by war, insurgency, strike, lockout (also regarding third parties on whose business premises the training is held), lawful, magisterial or juridical decisions and regulations or any circumstances beyond the reasonable control of the parties. The party affected by the Force Majeure shall notify in writing the other party immediately upon its becoming aware of the occurrence of such events. This also applies to the conclusion of such events.

Where the Force Majeure continues for more than 2 months, either party shall have the right to terminate the Contract without any liability. If the parties shall mutually agree, alternative dates for provision of the Services may be agreed in line with Clause 3.

11. Reservation of right to modify

PTI reserves the right to change the location of training courses and/or for justifiable reasons (such as, without limitation, where there are too few participants or if the instructor is ill) to postpone or cancel the Services and/or to assign a different speaker/instructor provided that PTI shall provide you with written notice of such change before the commencement of the Services.

If any such change occurs (other than cancellation by PTI of the Services), you shall be entitled to cancel your registration/s by provision of written notice provided to PTI within 5 working days of your receipt of such notice of change. In the event of such cancellation by you or in the event of cancellation by PTI of the Services, PTI's liability shall be limited only to a refund of the Price or any portion thereof, if such payment had previously been made to PTI.

Alternative dates for provision of the Services shall be agreed in line with Clause 2.

12. Applicable law, legal venue

Unless otherwise agreed between the parties, the contract shall be in all respects governed by the laws of England.

13. Exceptions

Exceptions to these terms and conditions or other and/or additional terms and conditions shall apply only if stated in the official order acknowledgement confirmation issued by PTI.

14. Written form

Unless otherwise agreed by both Parties, modifications to these conditions or any part thereof shall not be effective unless made in writing and signed by both Parties.

General terms and conditions for training at Siemens Power Academy TD (Germany)



1. Registration

Applications to attend courses must be submitted in writing or electronically using the registration form or www.siemens.com/ptd-training. Registrations imply recognition of our SIEMENS E D SE PT General Terms and Conditions for Training.

2. Acknowledgement of registration

We shall send you confirmation of the requested training course, course dates and fee, or, if there are no vacancies for the dates you have requested, we send an acknowledgement in the form of a provisional notification giving alternative dates. You should notify us within 14 days if you are unable to attend on the suggested alternative date. If we do not hear from you within the specified time frame, we shall assume that you have accepted the dates we have proposed.

3. PTD SE PT services

Our services comprise

- running training courses
- providing documentation accompanying the training
- providing the requisite materials and resources
- issuing a certificate of attendance. Certificates of attendance are only issued, however, if participants attend at least 80% of the training course.

Training course descriptions are accurate at the time they are issued. We reserve the right to change, adapt or develop course contents to reflect the current state of the art and course contents may, as a result, deviate from those specified in course descriptions.

4. Prices and terms of payment

Training course prices are specified in the descriptions in the catalog. Catalog prices do not include the cost of accommodation and travel. The scope of services and price of customized training courses are specified in the offer.

The statutory rate of value-added tax shall be added to all prices quoted.

Upon completion of the training course, participants will be issued an invoice which shall be due for settlement with 14 days with no deduction. Internal participants shall be invoiced by way of internal procedures on internal company terms and conditions.

5. Cancellations by registered participants

Registered participants shall be entitled to nominate alternative participants prior to the commencement of the training course.

We shall charge the confirmed prices for registered and confirmed course places even in the case of non-attendance. Course places may be cancelled in writing at no charge up to 28 days before the training course begins. 50% of the price of the training course will be charged for cancellations received up to 14 days before the course begins. The full price will be charged for all cancellations received later than 14 days prior to the start of the course. Decisive for the cancellation dates is the date of receipt of a written cancellation by E D SE PT.

6. Copyright

Written course materials may not be reproduced for any purpose without the consent of E D SE PT and may only otherwise be used for purposes explicitly authorized by

E D SE PT.

Siemens software used or provided for the purpose of conducting the training course may not be removed, nor copied (neither in whole nor or part), nor used in any other unauthorized way.

No video recording or sound recording is permitted.

7. Safety regulations

Course participants shall comply with all safety and accident-prevention regulations in force on Siemens' premises. They shall also be bound by all other applicable rules, particularly those concerning access.

8. Liability

All technical information provided in the courses and in the training documentation is correct to the best of our knowledge. No liability shall be assumed for the accuracy (e.g. exclusion of printing errors) of the information provided in the course or in the training documents.

Siemens E D SE PT shall be liable for personal injuries caused by Siemens E D SE PT in accordance with statutory provisions. Siemens E D SE PT shall be liable for property damage caused by Siemens and shall pay compensation, not exceeding 25,000 Euros per instance of damages, to cover the costs of reversing such damage. In the event of damage to data carrier material, the duty to replace shall not include the cost of restoring lost data. Claims for damages other than those explicitly referred to in these terms and conditions – in particular claims for stoppages, lost profits, lost data, or consequential damages – are excluded, regardless of their legal grounds, unless liability is cogent, e.g. under the terms of German Product Liability legislation (Produkthaftungsgesetz) or in cases of intent, gross negligence, absence of contractually warranted characteristics, or fundamental breach of contract. Claims for damages shall, however, be limited to typically foreseeable damages unless such damages are due to intentional acts or gross negligence.

If events are held on the premises or grounds of third parties, Siemens E D SE PT shall not be liable to participants in the event of accidents, nor for loss of or damage to participants' property, unless such damage has been caused by Siemens

E D SE PT or its employees.

9. Reservation of right of modification

We reserve the right to change the location of training courses and/or to postpone and, for justifiable reasons (such as too few participants or if the instructor is ill), to cancel courses or to assign a different speaker/instructor. Payment claims lapse if a course is cancelled. If the location or time of the course is changed, the registered participant is entitled to cancel his or her registration in writing within 3 working days of receipt of such notice of change. All other claims for substitution, damages or losses are excluded.

10. Export controls

The training contract and execution of the contract are subject to the proviso that the required export licenses are issued; performance may be barred by export regulations applicable in Germany or other countries.

Goods labeled with "ALnot equal to N" are subject to European or German export authorization when being exported out of the EU. Goods labeled with "ECCN not equal to N" are subject to US reexport authorization. Even without a label, or with label "AL:N" or "ECCN:N", authorization may be required due to the final end-use and destination for which the goods are to be used.

11. Applicable law, legal venue

This Agreement is subject to German substantive law to the exclusion of the United Nations Convention on the International Sale of Goods. The legal venue for registered traders is Nuremberg.

Written form

The parties agree that all agreements shall be made in writing. This written-form requirement may likewise only be waived in writing./ Information.

Siemens Power Academy TD, July 2008