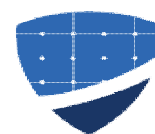




Siemens Power Academy Lagos **2015 Education and Training Catalogue**

Courses and Certification



**LAGOS
ENERGY
ACADEMY**

SIEMENS

Welcome Words

Welcome to our
Siemens Power
Academy Lagos

Training is the key to success.

We are happy to see you are interested in the Siemens Power Academy services. This catalogue offers you an overview and explanations on the comprehensive training schedule for 2014 in our Power Academy located in Lagos.

In our philosophy 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. As the training provider of your choice we deliver challenging course content that addresses you and your employee's needs. As pioneers in this field worldwide, our training programme is based on a curriculum concept. Our in house expertise competence development program enables you to permanently expand the knowledge of your employees and build up, therefore, in your company sustainable expertise and know-how (you will receive a full information basis in our brochure "The curricula of Siemens Power Academy TD").

In Siemens Ltd. Power Academy Lagos, you can choose between different standard trainings, customized trainings fully tailored for your needs, daily work oriented workshops based on the job issues, curricula, technical + business training courses for instance sale technical trainings. Our training offer incorporated products and systems of the whole Energy chain, started with general power engineering courses over industry automation to distribution, protection and power automation systems up to system software design – always with the focus on product-related training. We offer you apprenticed as well as certified main-trainers and top-experts from our operating business to ensure that your employees are effectively trained and coached.

The participation in one of our certification programs will be affirmed with a certified degree (a certificate), depending on its level. All the courses are didactically and methodologically rehashed and consequently supported by the optimal usage of equipment, scripts, slides and documents. Our training concept makes full use of the subsequent mixture between theory and practical. Our modern and world-wide attested learning-organization style serves you. We take care of the organization, so you and your staff can concentrate fully on the course-content.

Profit from Siemens' over 160 years of global experience!

Our team would also be happy to answer any questions you may have about the content of the training courses. We look forward to meeting you at one of our training sessions.

Siemens Power Academy, Lagos

Realizing your Dreams

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Headquarters and Regional Course Location

In January 2011, our new Power Academy in Lagos has opened its doors. The new Centre is set up on our headquarter ground in Lagos. Our modern classrooms are ready for instruction with training equipment.

Siemens Power Academy, Lagos
c/o Lagos Energy Academy (LEA)
Lagos State Electricity Board Compound (LSEB)
Old Secretariat, Oba Akinjobi Road
G.R.A, Ikeja - Lagos, Nigeria
www.siemens.com.ng / www.siemens.com.ng/en/about/poweracademy.htm



SIEMENS POWER ACADEMY

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Power Academy Training Rooms

Room 1



Power Academy Training Rooms

Room 2



Power Academy Training Rooms

Room 3



Power Academy Training Rooms

Demo Room



Courses, Certifications and Curriculum

Courses

Course identifiers and numbers. Our courses are grouped by course identifiers and leveling numbers allowing you to easily navigate courses in a specific subject area. Need help finding the right course? Our staff will be happy to help you find training that meets your experience level and learning objectives. We can also provide guidance on building progressive training plans that will address your career development goals and objectives. Our course identifiers are categorized as follows:

Certifications

Siemens Power Academy Certifications are a great way for engineering professionals to validate skills and demonstrate knowledge and proficiencies in a competitive landscape. Our certifications also provide a means of common measurement for evaluating that knowledge. The mission of Siemens Power Academy Certification is to provide a reliable, valid and valued model of training power system engineers. Provide a fair, repeatable and consistent method of assessing skills and knowledge. Develop a community of professionals who understand the need for certification in the power system.

About the program

With the pace of change in today's energy landscape, continued skill development and knowledge acquisition provides the footing for the continuous journey of becoming a trusted resource. To guide you in this journey, our certification programs combine requirements of training/education, experience and validation. These certifications create training roadmaps that assist both learner and employer with faster onboarding of new hires, provide solid milestones for employee development plans and serve as a mechanism for knowledge transfer and succession planning. Siemens Power Academy TD has developed Associate, Advanced and Expert Certifications, which may be earned in the three curriculums described in the following section. For each certification level, students must complete several required courses, and also complete a specified number of electives in their area of interest. More so than a series of individual courses, these progressive certification programs ensure foundational knowledge acquisition and overcome specific knowledge gaps. Students progress from understanding and performing technical tasks at the Associate level to independent analysis at the Advanced level, and culminate at the Expert level certification with synthesis and evaluation of abstract concepts, and judgment about information and validity of ideas. If you are seeking certification, please speak with one of our education staff coordinators. Together, we will identify which certification program is right for you. To map out your plan to successful completion of the certification requirements, we will review our course offerings, as well as your work experience and testing requirements. Once your training roadmap is planned, you can enroll in your first course and begin training. Course testing can be scheduled up to six months after your completion of the course. All testing is completed through our online learning management system and grades are provided in a formal transcript. Upon successful completion, you enroll in your next course and continue this process until all requirements are met.

The Associate Certification course series engages students, in their first few years of employment, in coursework that is essential for new engineers – in the practical application of theory, in software training for productivity and in coursework that assists engineers transferring from mechanical or civil engineering. Upon completion of the required coursework and assessments, the participant should be able to perform technical tasks under direction, and translate, interpret and extrapolate key concepts, methodologies, principles, theories and industry practices. The Associate level certification will position candidates for advancement and ready them for more challenging work assignments as they develop in the industry. It is anticipated that completion of this coursework will take one to three years.

The Advanced Certification requires the completion of Associate level certification and demonstrated industry experience. Candidates for the Advanced certification level will be able to demonstrate four to eight years of experience in their area of study. Students may be pre-tested or provide examples of their knowledge/experience to verify their readiness for these advanced level courses. Upon completion of the required coursework and assessments, the participant should be able to independently solve problems by applying principles and acquired knowledge. It is anticipated that completion of this coursework will span several years.

The Expert Certification requires the completion of Advanced level certification and demonstrated industry experience. Candidates for the Expert certification level will be able to demonstrate nine to 12 years of experience in their area of study. Students may be pre-tested or provide examples of their knowledge/experience to verify their readiness for these expert level courses. Upon completion of the required coursework and assessments, the participant should be able to perform complex technical tasks independently and advise others on the performance of these tasks, as well as be able to evaluate, synthesize and communicate abstract concepts and make judgments about information and validity of ideas. It is anticipated that completion of this coursework will span several years.

General Power Engineering Courses

Power Transmission and Distribution Systems - Load and Short Circuit Calculation (9CA4110-ONE00-ONG4)

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.

Target Audience

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

Prerequisites

Basics of Electrical Engineering.

Duration

2 days

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

Price: 100, 000 NGN (includes a daily meal, coffee, water, cakes, etc...)

Dates: 12-13/01/2015, 23-24/04/2015, 05-06/11/2015

Transmission and distribution networks - Basics Part I (9CA10-ONE-NG1)

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.

Target Audience

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

Prerequisites

Basics of Electrical Engineering.

Duration

3 days

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

Price: 150, 000 NGN (includes a daily meal, coffee, water, cakes, etc...)

Dates: 23-25/03/2015, 27-29/07/2015, 09-11/11/2015

Transmission and Distribution Networks - Basics Part II (9CA10-0NE-NG2)

Training Objectives

The participants will deepen the basic knowledge of electrical power systems and the correlations between the individual power transmission and distribution components obtained in Part 1. They will learn about the tasks of power system components such as generators, transformers, motors, lines, cables and busbars. We will provide in-depth information on the configuration and application of components of an electrical power supply system and the tasks and basic principles of power system protection.

Target Audience

Employees of power plants, power supply utilities/industrial sector and individuals interested in technical fields who want to obtain a basic understanding of processes in electrical supply systems or refresh their technical knowledge.

Prerequisites

Basic knowledge of physics, preferably electrical engineering, course "Transmission and Distribution Networks – Basics Part I (PE-TDNET1)".

Duration

3 days

Main Features

- Cables and lines for power transmission and distribution
- Transformers and their characteristic data, connection symbols, grounding principles, voltage control and tap changers, Generator, motor - basic principles
- Circuit breaker types, vacuum-switching technique and SF6 switching systems, switching operations, arc extinction principles
- Air- and gas-insulated switchgear

- Reactive power management; shunt and series compensation
- FACTS and high voltage direct current transmission systems (HVDC)
- Voltage and current measurement for protection, control and metering
- Principles and types of power system protection, design of protection systems, protection principles for transmission and distribution systems
- Calculation examples consolidate the gained knowledge and help understand the correlations

Price: 150, 000 NGN (includes a daily meal, coffee, water, cakes, etc...)

Dates: 28-30/01/2015, 06-08/05/2015

Power System Planning - Principles (code: 9CA4110-ONE00-ONG5)

Training Objectives

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

Target Audience

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

Prerequisites

Basics of Electrical Engineering.

Duration

3 days

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.

Price: 150, 000 NGN (includes a daily meal, coffee, water, cakes, etc...)

Dates: 19-21/01/2015, 08-10/04/2015, 16-18/11/2015

Design and Projection of Industrial Electrical Networks using the Software SIMARIS (code: IENSS)

Target Audience

Junior Engineers, Engineers, Technicians and Specialists working or willing to go into Network /system planning, design, engineering or dimensioning. The course addresses also Equipment specifiers, project engineers, project managers, technical Sales & marketing personnel, etc...

Training Objectives (Learning Targets)

On completion of the compact training, the participant will acquire a sounding overview of power engineering in theory & practise and the expertise required to plan, engineer and dimension power systems and networks. He will gather information on the structure of an industrial power network. He will understand the different equipments and systems present in typical industry network, their dimensioning and calibration/setting. Using the SIMARIS software, he will exercise examples of true life situation in regard of planning of networks and dimensioning of power equipment. Aside the technical aspects of the planning, he will understand the financial implications of its planning on the operation and the management of the power systems. The practical Session (using SIMARIS) will enable to familiarize with Siemens portfolio (product range and specification) as in regard of products and systems used for power distribution.

Prerequisites

Basics understanding of mathematics and technical physics, basic of power engineering and/or electrotechnique is a plus, sounding exposure in a power engineering environment, experience in dimensioning of electrical equipment is an advantage but not a must.

Main Features (course content)

Basics of Load and Short Circuit Calculation in Power Transmission and Distribution Systems
Principles of Power System Planning
Principles of Power System and Network Design and Engineering
Application using the Software SIMARIS

Duration

5 days

Price

300,000 NGN

Dates: 20-24/04/2015, 17-21/08/2015

Electrical Power Issues in Nigeria for Bankers, Investors and Professionals (9CA4130-0ME-NG6)

Training Objectives

Participants will leave the course with a thorough practical understanding of: How lenders analyse power projects – from both a qualitative and a quantitative perspective, how project financings are sized and tailored to the cash flow of a specific project, the loan documents which govern a financing and how they interface with the other project documents such as power sales agreements, EPC contracts, supply agreements and insurance arrangements

Target Audience

Managers, Supervisors, Project managers, economists and engineers or any staff involved in ventures in relation with project financing.

Prerequisites

None

Duration

3 days

Main Features

- Introduction to power engineering, physical grid and terminologies
- The power sector in Nigeria, institutions and evolution of the market
- Power economics (especially in emerging countries), financial grid
- Managing power projects,
- Power projects financing and investment

Price: 250, 000 NGN (includes a daily meal, coffee, water, cakes, etc...)

Dates: 08-10/06/2015, 05-07/08/2015

Siemens Energy Program for Graduates and Young Engineers (9CA4130-0ME-NG7)

Training Objectives

On completion of the training, the participant could apply for a license as electrical expert, work as electrical technician for a power utility or in an industrial set up, or work as a self employed Electrical Technician capable of performing installation, operation and maintenance jobs on electrical installations (utility, domestic and industrial networks).

Target Audience

Junior Engineers, field personal, Technicians and young graduates seeking for first engineering exposure or technical qualification in power engineering.

Prerequisites

Basic knowledge of Electrical Engineering and / or first relevant technical exposure in the power industry.

Duration

3 months

Main Features

- General electrical energy principles;
- Principles of power system planning;
- Principles of system protection;
- The physical grid – components, operations and reliability, dynamic phenomena, stability;

- Smart metering and smart grid, meter data management etc.
- Managing power projects – planning, process tools, community and environmental issues etc.;
- Financial Grid – supply & demand, regulation, market design, pricing and tariff, load flow analysis, energy auditing, etc.;
- Power impacts – integration of renewable, environmental, social, financial and governmental issues, etc..

Price: 825,000 NGN (includes daily meal, coffee, water, cakes, etc...)

Dates: Feb - April 2015, Jul - Sept 2015

Rural Electrification Techniques for Engineers and Technicians (9CA4130-OME-NG9)

Training Objectives

The participants will gain knowledge of the commissioning and maintenance of distribution transformers, their cooling methods and block distribution stations. They will be able to, identify, use and maintain different types of cables, carry out cable jointing and cable termination, conduct tests on cables, carry out installation earthing. They will be able to install, commission and maintain basic supply and lighting units using Photovoltaic.

Target Audience

Engineers, junior engineers, field personal and technicians involved in operation, planning, design, maintenance and servicing of rural electrification systems.

Prerequisites

Basic knowledge of electrical engineering.

Duration

10 Days

Main Features

- Transformer installation and maintenance,
- Block distribution stations / Ring Main Units (including different types of switchgears)
- Cable splicing and termination,
- System and installation earthing
- Photo voltaic power supply and lighting units.

Price: 525,000 NGN (includes daily meal, coffee, water, cakes, etc...)

Dates: 13-24/04/2015, 05-16/10/2015

Fundamentals of Power Systems Economics (FPSE-03)

Training Objectives

On completion of the training, the participant will gather fundamental knowledge of planning and operation of power systems. He will understand competitions issues in the electricity supply industry. He will be capable to understand the structure of electricity supply industry and the microeconomics principles essential for electricity markets. He will understand the issues of investments in power generation and transmission equipment in a competitive environment.

Target Audience

Managers, Supervisors, Project managers, economists and engineers or any staff involved in ventures in relation with deregulation or competition issues on Electricity Markets. Economists, Engineers and other professionals who want to understand the engineering / microeconomics perspectives of power systems.

Prerequisites

Basic knowledge of electrical engineering and / or first relevant technical exposure in the power industry. But not a must.

Duration

3 Days

Main Features

- Introduction, Competition, Models of competition
- Fundamental of markets, concepts and types
- Markets for electrical Energy
- Participating in markets for electrical energy
- System security and ancillary services
- Transmission networks and electricity market
- Investing in Generation
- Investing in Transmission
- Answers to selected problems.

Price: 150,000 NGN (includes daily meal, coffee, water, cakes, etc...)

Dates: 09-11/03/2015, 07-09/09/2015

Electricity Market Regulation (EMR-05)

Training Objectives

The training focuses on electricity regulation with the objective of delivering knowledge in and understanding of regulation issues. The training program provided and disseminated relevant knowledge related to conceptual properties and practical applications of regulation in the electricity industry. The Seminar is designed in clear and understandable form in order to allow successful participation of a non-expert audience.

Target Audience

Managers, Supervisors, Project Managers, Economists and Engineers or any staff involved in ventures in relation with Electricity Markets. Staff, Managers and Professionals from Power Utilities, Power Industries, Parastatals and Electricity Regulatory Agencies.

Prerequisites

Basic understanding of the electricity market. Ideally the participant should have visited the training fundamental of electricity systems economics and / or have a first relevant exposure in the electric power industry.

Duration

5 Days

Main Features

- General Principles
- Market Design
- Price regulation
- Revenue requirements and Regulatory Asset Base
- cost of capital
- efficiency assessment
- Quality of supply regulation
- Pricing

Price: 250,000 NGN (includes daily meal, coffee, water, cakes, etc...)

Dates: 09-13/02/2015, 08-12/06/2015

Primary Technology – Distribution Systems

Switching Devices and Switchgear - Basics and Application (code: 9CA4130-0ME00-0NG2)

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.

Target Audience

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

Prerequisites

Basic technical knowledge

Duration

3 days

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

Price: 150, 000 NGN (includes a daily meal, coffee, water, cakes, etc...)

Dates: 08-10/04/2015, 14-16/09/2015

Medium Voltage Equipments: 10 Days Certification Program for Operation and Maintenance (9CA4130-0ME-NG8)

Training Objectives

The participants will be familiarized with selection, engineering, operation and maintenance of Medium voltage switchgears and power transformers.

Target Audience

Supervisors, Engineers, field personal, technicians and Specialists involved in operation, planning, design, maintenance and servicing of switchgears, transformers and protecting equipments from electric utilities and the industrial sector

Prerequisites

Basic knowledge of electrical engineering and first relevant exposure to MV equipments.

Duration

10 days

Main Features

- Technical information course medium voltage switchgears and switching equipments: selection, planning and design functions, locating and rectifying faults, safety regulations, handling of SF6 gas.
- Technical information course for operating personnel-power transformers: selection, planning and design functions, assembly and inspection, safety regulations.
- Medium Voltage switchgears- NSPLUSC, 8DA, Operation and maintenance: fundamental functions and characteristics, Installation, operation and maintenance of breaking devices, etc..
- Power and distribution transformers- Technical workshop: operation and maintenance
- Technical workshop-life cycle management-
- Protection of Transformers

Price: 525,000 NGN (includes daily meal, coffee, water, cakes, etc...)

Dates: 16-27/03/2015, 06-17/07/2015, 07-18/09/2015

Secondary Technology – Protection Systems

SIPROTEC 4 – Practical Workshop/Guided Exercises (9CA4140-0SE00-ONG1)

Training Objectives

The participant has knowledge of concept and application of the protection systems that was agreed upon.

Target Audience

Engineers working in the field of protection, i.e. engineering, operation, commissioning, maintenance and repair.

Prerequisites

Basic knowledge of protection technology.

Duration

5 days

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
 - 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.

Price: 250, 000 NGN (includes a daily meal, coffee, water, cakes, etc...)

Dates: 11-15/05/2015, 10-14/08/2015

SIPROTEC 4 – Secondary Testing with the OMICRON Test System CMC (code: 9CA4140-0SE00-0GF6)

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.

Target Audience

Engineers and technicians of power utilities and industries who deal with commissioning and periodic testing of protective relays.

Prerequisites

Basic knowledge of protection technology.

Duration

3 days

Main Features

- Introduction to the relay test system (software architecture, hardware configuration, interfaces, programming and automation)
- Presentation of the test technology for overcurrent, distance and differential protection (which functions, how to be tested, scope of testing)
- Testing the starting elements $I>$ and $Z<$
- Testing the tripping characteristics in the R/X and Diff/Stab diagram
- Testing the trip times $t(I)$ and $t(Z)$
- Testing the functionality of the earth fault elements
- Testing auto reclosing
- Testing switch onto fault
- Testing harmonic and over excitation restraint
- Testing current and voltage supervision

Notes

The relay test documents will be developed online and their successful operation is shown.

Price: 150, 000 NGN (includes a daily meal, coffee, water, cakes, etc...)

Dates: 18-20/03/2015, 29-31/07/2015, 16-18/12/2015

Principles of Numerical Protection Technology (code: 9CA4140-0SS00-NGA2)

Training Objectives

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

Target Audience

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

Prerequisites

Basic knowledge of electrical engineering.

Duration

3 days

Main Features

- Concepts and application of protection systems
- Overcurrent time protection
- Distance protection
- Line differential protection
- Busbar protection
- Transformer differential protection
- Motor protection

Price: 250, 000 NGN(includes a daily meal, coffee, water, cakes, etc...)

Dates: 16-18/02/2015, 10-12/06/2015, 21-23/10/2015

[SIPROTEC – Using Numerical Machine and Motor Protection \(code: 9CA4140-0SS00-0NG5\)](#)

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.

Target Audience

Engineers working in the field of protection, i.e. engineering, operation, commissioning, maintenance and repair

Prerequisites

Basic knowledge of protection technology.

Duration

4 days

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
- Transformer differential device 7UT
- Busbar protection 7SS
- Exercises with line, transformer and busbar differential devices

Price: 200, 000 NGN (includes a daily meal, coffee, water, cakes, etc...)

Dates: 23-26/06/2015, 24-27/11/2015

DIGSI 4 - Basic (code: 9CA4140-0SE00-0NG1)

Training Objectives

The participants will get to know the DIGSI 4 operating program. They will learn how to adjust, manage, operate and analyse faults of SIPROTEC 4 devices using the DIGSI 4 operating program. They use DIGSI 4 program to configure and perform their own functions and control tasks.

Target Audience

Users from electric utilities and the industrial sector interested in the commissioning, maintenance and operation of SIPROTEC 4 devices.

Prerequisites

Basic knowledge of electrical engineering.

Duration

3 days

Main Features

- Introduction
- Plant and equipment management
- Configuring of protection settings of SIPROTEC 4 devices
 - Data management
 - Parameter assignment
 - Project planning
- Commissioning phase
 - Checking inputs/outputs
 - Simulating faults
 - Analysing fault records
- Control of switching devices
 - Interlocked/not interlocked
 - Local/Remote control
- Graphical configuring of logic functions and interlocks with the logic editor CFC
- Graphical configuring of the default and control display with the display editor
- Practical application of all topics

Price: 150, 000 NGN (includes a daily meal, coffee, water, cakes, etc...)

Dates: 25-27/02/2015, 08-10/07/2015, 02-04/12/2015

Protection Technology - Principles (9CA4140-0SS-NG2)

Training Objectives

The Participants will learn about basics of possible applications, principles of operation and the overall concept of the most important protection devices.

Target Audience

Employees of power supply utilities and the industrial sector that is familiar with the planning, commissioning and maintenance of power system protection equipment.

Prerequisites

Basic knowledge of electrical engineering.

Duration

3 days

Main Features

- Protection Principles
- Earth fault
- Current transformer dimensioning
- Overcurrent-time protection
- Distance protection
- Line and transformer differential protection
- Busbar protection
- Frequency protection
- Motor protection

Price: 150, 000 NGN (includes a daily meal, coffee, water, cakes, etc...)

Dates: 21-23/01/2015, 17-19/06/2015, 28-30/10/2015

SIPROTEC 4 - Application and Exercises (9CA4140-0SE-NG-DF1)

Training Objectives

The Participants will become familiar with the concept and principle of operation of the digital network protection systems SIPROTECT 4.

Target Audience

Power system protection experts, who have been assigned to plan, commission and maintain digital protection systems.

Prerequisites

Basic knowledge of power system protection. Course "Protection Technology – Principles (PR-PRIN)" or comparable knowledge. Course "DIGSI 4 – Basics (DIGSI 4 – B)" or comparable knowledge.

Duration

5 days

Main Features

- General properties of SIPROTEC 4
- Operation of protection relays with DIGSI 4
- Distance protection 7SA
- Transformer differential protection 7UT
- Differential protection 7SD
- Busbar protection 7SS
- SIPROTEC hardware
- Hardware, jumpers, interfaces, electrostatic sensitive devices, firmware.
- Motor protection

Price: 250, 000 NGN (includes a daily meal, coffee, water, cakes, etc...)

Dates: 09-13/03/2015, 16-20/11/2015

SIPROTEC 4 - Protection Engineering Complete: 10 Days Certificate Program (9CA4140-0SE00-ONG2)

Training Objectives

The participants will be familiarized with selection, commissioning, operation and maintenance of protection schemes and system protection equipments. They will get to know the softwares used to operate, to analyze faults and to test the numerical relays.

Target Audience

Supervisors, Engineers, field personal, technicians and Specialists involved in operation, planning, design, maintenance and servicing of switchgears, transformers and protecting equipments from electric utilities and the industrial sector.

Prerequisites

Basic knowledge of electrical engineering and first relevant exposure to power system protection.

Duration

10 days

Main Features

- Principles of Numerical Protection Technology
- DIGSI 4-Basics of Protection And Control Functions
- SIGRA 4- Efficient interpretation of fault records of SIPROTEC-devices
- SIPROTEC 4-Protection Devices for Service Engineers
- SIPROTEC 4- Secondary Relay Testing with the OMICRON Test System

Price: 525,000NGN (includes a daily meal, coffee, water, cakes, etc...)

Dates: 13-24/05/2015, 07-18/09/2015, 02-13/11/2015

Protection for Oil and Gas Power Networks (40-0SE00-0NG3)

Training Objectives

In the first week of training characteristics and components of a typical Oil & Gas network as well as topics of studies are discussed, e.g. load flow, short circuit, motor start, voltage and frequency stability, protection settings coordination, and typical setting report. Based on a real-life example, industrial network design topics like network structure, reliability of supply, protection concept, contingency analysis, and load shedding analysis are presented in order to provide a proper response to minimize consequences of faults. Calculation tools are used to simulate short circuits, motor starts, motor reacceleration etc. In the second week of training practical exercises with Siemens' over current and differential protection relays for line, transformer, and motor equipment within the real-life industrial network example are executed. The trainees are taught to interpret and analyze an incident by using available fault records.

Target Audience

This training is directed at plant protection engineers, who would like to increase their analytical and practical skills for system protection.

Prerequisites

University degree in protection engineering.

Duration

10 days

Main Features

- Theoretical training content (Part 1)
- Protection concept and settings coordination principles:
- Power supply reliability
- Network structures
- Load flow and contingencies analysis
- Short circuit analysis for phase & earth faults
- Current transformer dimensioning
- Over current-time protection
- Distance protection
- Differential protection
- Frequency protection
- Motor protection
- Transformer protection
- Cable and overhead line protection
- IEC 61850 / GOOSE Theory basics such as data model and services

Practical training content (Part 2)

DIGSI® 4 operating and evaluation software:

- How to set up a project structure in Project Manager
- How to get and set a relay parameters in Device Manager
- How to go online and work online
- How to change settings – with DIGSI® and relay front port
- How to feed back setting changes to the planning department
- How to do maintenance with DIGSI®

Over current protection device 7SJ relay:

- Ordering information and accessories
- Scope of functions
- Overall operation hardware and connections
- Doing sample settings and settings discussion
- Information configuration matrix for input/output/internal signals
- Measurement supervision, fault interpretation by using SIGRA®
- Hands-on training with 7SJ relays,
- DIGSI®, SIGRA® with using secondary test equipment (e. g. omicron) to produce faults such as single phase, two phase and three phase faults (short circuits) with low and with high current.
- Hands-on training with 7SJ relays,
- DIGSI®, SIGRA® with using secondary test equipment (e. g. OMICRON) to produce faults like: motor start (rotor blocked, starting time supervision), overloaded motor and cable.

Differential protection device 7SD and 7UT relays:

- Ordering information and accessories
- Scope of functions
- Overall operation hardware and connections
- Doing sample settings and settings discussion
- Information configuration matrix for input/output/internal signals
- Measurement supervision, fault interpretation by using SIGRA®
- Hands-on training with 7SD / 7UT relays, DIGSI®, SIGRA® and Test equipment with using secondary test equipment (e. g. OMICRON) to produce faults such as internal and external faults and analyze them.
- Establish and use the "WEB Monitor

Final discussion:

- Typical report and settings
- How to set protection devices in accordance to the typical setting report, as taught in the first week of training

Price: 450000 NGN (includes a daily meal, coffee, water, cakes, etc...)

Dates: 16-27/03/2015

Secondary Technology – Substation Automation Systems

Telecontrol and Automation - Fundamentals (code: 9CA4140-0AE00-0NG0)

Training Objectives

The participants are familiar with the terms and problem definitions of the automatic control engineering. Thus they have the basis, in order to turn to product-related training courses.

Target audience

Employees from power utilities and industry wishing to gain a basic knowledge on Substation Automation Systems and equipment and willing to work with telecontrol and automation systems.

Prerequisites

Basic knowledge of electrical engineering.

Duration

2 days

Main Features

- Objective of automation
- Basic structures of automation systems
- Information to important standards
- IEC 60870-5
- Information and their handling
- binary information, measured values, integrated totals
- commands, setpoint values
- communication
- physical interfaces and communication equipment
- serial transmission methods
- Organization of the interaction
- overall concept
- Data addressing
- Diagnosis
- flexibility, extensibility
- Measures to the increased reliability and availability

Price: 100, 000 NGN (includes a daily meal, coffee, water, cakes, etc...)

Dates: 02-03/07/2015, 19-20/11/2015

SICAM PAS - Basic (code: 9CA4140-0AE00-0NG1)

Training Objectives

The participants develop an understanding for the productivity of the scalable automation unit SICAM PAS V7. They gain an overview of the construction of SICAM PAS V7. The participants will gain a basic knowledge of SICAM PAS V7 system and how to use it. They will learn about the operation and will find out how to use this in the system management.

Target Audience

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

Prerequisites

Knowledge of the most important terms in telecontrol technology.

Fundamentals of telecontrol and automation.

Basic knowledge of electrical engineering.

Duration

3 days

Main Features

- Product families at a glance
- Introduction to SICAM PAS total system
- System Functions
- Intro to PQS functions
- System Components
- Licensing
- SICAM PAS UI - User Interface
- PAS Runtime System Control with UI Operation
- Test- and Diagnostic tool SICAM Value Viewer
- Basics of Telecommunication
- Interface Test Program
- Siemens Serial Hub
- Local HMI system SICAM PAS CC
- IEC 61850 - Communication Standard for Switchgears
- SICAM PAS Station Unit
- PAS Redundancy concept
- Configuration Examples

Notice

This course is also part of Curricula. On demand the respective e-test can be booked by Internet. Please enter the booking code into search field: 03AEXA1

Price: 150, 000 NGN (includes a daily meal, coffee, water, cakes, etc...)

Dates: 25-27/05/2015, 05-07/08/2015

SICAM PAS – Parameterization (code: 9CA4140-0AE00-0NG2)

Training Objectives

The participant gains the knowledge required to carry out the maintenance of the scalable automation system SICAM. The participants will be able to independently set up a SICAM PAS V7 configuration.

Target Audience

Employees from power utilities and industry wishing to gain a basic knowledge of the planning, commissioning and maintenance of Substation Automation Systems and equipment. Furthermore Service technicians involved in the maintenance of SICAM PAS systems. Technicians involved in the engineering of SICAM PAS automation systems. Customers from power utilities and industry who wish to do user specific parameterization.

Prerequisites

Knowledge of the most important terms in telecontrol technology.

Basic knowledge of electrical engineering.

SICAM PAS - Basic course is essential !!!

Duration

5 days

Main Features

- Summary of basics of SICAM PAS
- Setting up SICAM PAS software
- Starting Parameterization
- Tele-Communication with IEC 101/104
- HMI Interface
- Topology
- System Variables
- Control Authority
- Communication with IEC 103
- CFC Logic Programming
- Configuring with IEC 61850
- User Administration
- SNMP Monitoring
- Redundancy
- Server-DIP-Configuration

Notice

This course is also part of Curricula. On demand the respective e-test can be booked by Internet. Please enter the booking code into search field: 03AEXA2

Price: 250, 000 NGN(includes a daily meal, coffee, water, Biscuites, etc...)

Dates: 03-07/08/2015, 12-16/10/2015

SICAM SCC– Configuring an Operator Station (code: 9CA4140-0AE00-0NG3)

Training Objectives

At the end of this training the participants are able to configure a graphical operator station with PAS CC V7.

Target Audience

Technicians, who want to realize complete solutions with the automation system SICAM PAS. Employees from power utilities and industry wishing to gain a sustainable engineering knowledge of the planning and design of Substation Automation Systems and equipment. Customers from power utilities and industry who wish to be able to modify the graphical user interface.

Prerequisites

Knowledge of the most important terms in telecontrol technology.

Basic knowledge of electrical engineering.

SICAM PAS - Basic course

SICAM PAS - Parameterization

Duration

3,5 days

Main Features

- System overview of SICAM PAS CC
- Installing SICAM PAS CC software
- PAS HMI Interface
- Devising a project
- Taking over data from SICAM PAS
- Graphics Designer
- Compatibility Key
- Switching Authority
- User Administrator
- Bay and Telecontrol Blocking
- Message lists
- Group Messages
- Sound Output
- Topological Coloring
- Practical exercises covering all topics

Notice

This course is also part of Curricula. On demand the respective e-test can be booked by Internet. Please enter the booking code into search field: 03AEXA3

Price: 175, 000 NGN(includes a daily meal, coffee, water, cakes, etc...)

Dates: On request

SICAM PAS - Complete, 10 Days Certification Course (9CA4140-0AE-NG1)

Training Objectives

The participants will gain a basic knowledge of the entire SICAM PAS system. They will be able to independently set up a SICAM PAS configuration and to configure a graphical operator station with SICAM SCC.

Target Audience

Customers from power utilities and industry responsible for operating a SICAM PAS system, who wish to do user specific parameterization and to be able to modify the graphical user interface.

Prerequisites

Fundamentals of telecontrol and automation.

Duration

10 days

Main Features

- This course combines following 3 single training courses:
- SICAM PAS - Basics
- SICAM PAS - Parameterization
- SICAM SCC - Configuring an Operator Station.

Price: 525,000 NGN (includes daily meal, coffee, water, cakes, etc...)

Dates: 27/7-07/08/2015, 07-18/12/2015

Substation Automation Equipments: 10 days Certificate Program for Installation and Commissioning (9CA4140-0AE-NG1)

Training Objectives

The participants will be familiarized with Installation and commissioning of substation automation system and equipments. Especially the eRTU system and power link equipments.

Target Audience

Supervisors, Engineers, field personal, technicians and Specialists involved in planning, design, installation, commissioning and servicing of substation automation systems (especially eRTU and power link) from electric utilities and the industrial sector.

Prerequisites

Fundamental of telecontrol and automation.

Duration

10 days

Main Features

- SICAM eRTU and SICAM diamond, systems Introduction, parameterization, configuration, Project creation, Display construction, Graphical topology, communication, Installation and commissioning
- Network communication solution
- Power link equipments.

Price: 525,000 NGN (includes daily meal, coffee, water, cakes, etc...)

Dates: 17-28/08/2015, 09-20/11/2015

System Software and Design

ELCAD 7.5.0 Basic (code: 9CA4100-3GE00-0NG3)

Training Objectives

The attendees are achieving skills in handling ELCAD projects and drawings within, using the Siemens Energy PTD60617 standard library. After the course they are able to create or copy schematic and circuit diagrams, generating automatically terminal diagrams, list of drawings, wiring & cable lists and parts lists. Modifying simple standard symbols is an additional goal.

Target Audience

Experienced designers, draftsmen or engineers in IEC circuit and schematic diagrams or users of previous ELCAD versions e.g. 5.8.x. familiar in reading electrical documents for e.g. high & medium voltage plants, transformer units and protection devices

Prerequisites

Major knowledge in designing of schematic diagrams and in understanding the designation system concerning the IEC standard is to be provided. Experience with high voltage & medium voltage technology would be advantageous.

Duration

5 days

Main Features

- Installation procedures of the Energy customized ELCAD 7.5.0 software, rules and guidelines for ELCAD at the Energy Sector
- Using the designation system in ELCAD (kind of documents, item identification, explanation sheet e.g. =/B/AB/1)
- Creating drawings, placing symbols from the toolbar, modifying watermarks
- Placing texts, translate settings, project header data, translate files \A, \B, \C, \D
- Learning and understanding the ELCAD commands, command overview
- Placing symbols, editing and evaluation of symbols, navigating, copying of symbols, sections and drawings
- Learning the different types of ELCAD symbols, e.g. using graphic symbols, potential symbols, window symbols
- Handling of electrical connections, doing standard and constrained connections, wiring lists
- Master & slave types, using flexible master symbols (boxes) for any relay type
- Terminals, placing multiple and standard terminals, bridges, links, accessories, different form sheets, generating terminal diagrams
- Cabling, cable master data base, how to place cable & core symbols, establishing cable and wiring lists
- Form sheets, filling in texts and revisions for documents. First steps in symbol design, modifying standard symbols, printing out symbol catalogue
- Conversion of drawings to PDF, DWG, DXF, TIFF, ASCII.

Price: 250, 000 NGN (includes a daily meal, coffee, water, cakes, etc...)

Dates: 14-18/09/2015

Industry Automation – SIMATIC S 7 Automation Systems

SIMATIC S7 - Service & Maintenance Course Part I (code: ST-7Serv1)

Training Objectives

This course is directed to users and maintenance personnel of SIMATIC S7 programmable controllers.

Prerequisites

Involvement in PLC maintenance

Duration

5 days

Main Features

- The SIMATIC STEP 7 system family
- STEP 7 installation techniques and components
- PLC installation and wiring techniques
- Hardware handling
- From process to project- the SIMATIC manager
- Hardware configuration and addressing of signal modules
- CPU properties
- Symbolic notation and symbols table handling
- LAD/ FBD / STL editor
- Commissioning and monitoring/modifying variables
- Linear/structured programming techniques
- Debugging a program
- Binary operations and gates
- Flip flops
- Edge detection
- Number formats/load and transfer operations
- Counters/timers
- Rewiring of programs
- Documentation functions, saving and archiving
- Copying a program to a memory card ETHERNET COMS with S7 Connections
- SYSTEM operating with communications
- Handling external devices using FDL or FMS
- Examples

Price: On request (includes daily meal, coffee, water, cakes, etc...)

Dates: 02-06/02/2015, 18-22/05/2015, 19-23/10/2015

SIMATIC S7 - Service & Maintenance Course Part II (code: ST-7Serv2)

Training Objectives

This course provides the fault finding techniques required for maintenance in depth with standard libraries. For those waiting to handle OBs and data handling. Documentation, networking and analogues as well as sequence controls.

Prerequisites

Successful completion of the service & maintenance course part I

Duration

5 days

Main features

- Hardware commissioning
- Memory reset, variable tables
- Modifying outputs in STOP state
- STEP7 protect secure
- Cyclic program execution
- Data storage in data blocks
- Complex data types
- Functions and function blocks
- Multiple instance model
- Trouble shooting
- B, I, L stack handling
- Cross reference
- Break points in a program
- Organization blocks
- Analog processing
- Documentation and printing
- Archiving a project
- Communication via MPI with GD table and NETPRO
- Totally integrated automation, discussion & examples of programming methods

Price: On request (includes daily meal, coffee, water, cakes, etc...)

Dates: 09-13/02/2015, 25-29/05/2015, 26-30/10/2015

SIMATIC S7 – Network Communications Course (code: KO-7COMS)

Training Objectives

Using the NETPRO package to set up a system linked by MPI, PROFIBUS & INDUSTRIAL ETHERNET.

Prerequisites

Successful completion of the ST-7SERV2 or ST-7PRO1 Course

Duration

5 days

Main features

- Setting up MPI COMS with GD Table
- Controlled MPI COMS
- Using NETPRO as a tool
- Setting up MPI, PROFIBUS & INDUSTRIAL ETHERNET COMS with S7 Connections
- SYSTEM operating with Communications
- Handling External devices using FDL or FMS
- Examples

Price: On request (includes a daily meal, coffee, water, cakes, etc...)

Dates: 23-27/03/2015, 20-24/07/2015, 02-06/11/2015

Industry Automation - MasterDrives

MasterDrives Frequency Converter Course VC (code: SD-MD-VC)

Training Objectives

This course will enable service and commissioning personnel to commission the unit.

Prerequisites

Sound knowledge base of variable speed drives.

Duration

5 days

Main features

- Introduction to MasterDrives
- Programming of the unit
- Basic configuration steps
- Using OP1s keypad unit
- Basic fault finding
- Communication using drive monitor
- Course exercises
- Control and set points from various sources
- Communication with PROFIBUS-DP

Price: On request (includes a daily meal, coffee, water, cakes, etc...)

Dates: 01-05/06/2015, 19-23/10/2015, 14-18/12/2015

Oil and Gas Training Offer

1. Electrical Engineering for Oil and Gas Field Personnel (Code: SPAL-EEOGP-01)

Training Objectives

At the end of the learning event, participants will be able to

- Describe typical arrangements of an electrical network,
- Describe the role and operating principles of the different pieces of equipment that make up the electrical network,
- Carry out installation and maintenance activities on electrical network and equipment for the oil and gas industry.

Target Audience

Electrical Engineers and Technicians working with or requiring technical knowledge on electrical installations and equipment used in the oil and gas industry.

Prerequisites

Basics of Electrical Engineering

Duration

3 days

Main Features

1. The electrical power distribution network:
 - Factors to be considered when designing an electrical power network,
 - Typical architecture of an electrical network: voltage levels; load classification; back-up management,
 - Neutral point connections and their effects on network operation,
 - Different connection schemes to public network.
2. Description and operating principles of electrical equipment:
 - Transformers,
 - Electrical cables,
 - Electrical panels,
 - Control and protection equipment,
 - Power supply back-up equipment – diesel/fuel generators, battery banks, rectifier units etc.
3. Synchronous and asynchronous motors; alternators:
 - Motors – operating principles; characteristics (speed, load, torque);
 - Motor start-up schemes,
 - Electrical and thermal protection of motors;
 - Speed control of motors.
 - Alternators (synchronous power generators).
4. Viability and safety of electrical installations in the oil and gas industry:
 - Selectivity of protections: different techniques,
 - Checking of isolation,
 - Electrical equipment for Explosive atmospheres: standards and maintenance constraints,
 - Rules for equipment Isolation/Consignation prior to and after maintenance.

Price: 300, 000 NGN (includes a daily meal, coffee, water, cakes, etc...)

Dates: on request

2. Gas Turbines

2.1. SGT-100/400 Industrial Gas Turbine: Operation & Maintenance (Code: SPAL-SGTOM-01)

Training Objectives

To provide customers' personnel responsible for the day to day operation and maintenance of the SGT 100/400 gas turbine with an insight into its design, major components, auxiliaries, applications and principle of operation.

Course Structure

The course is designed to provide the course delegate with an understanding of the principles of gas turbine operation and specific knowledge of the SGT-100/400 gas turbine, its computerized control and associated systems. A combination of theoretical and practical training is provided in classrooms with state-of-the-art training aids and in our extensively equipped training workshop.

Target Audience

All rotating machinery operation and maintenance personnel. The course content can be tailored for either new or experienced staff.

Duration

5 days

Location: Siemens Power Academy Lagos

Main Features

- Health, Safety and Environmental (HSE).
- Gas Turbine: Operation, construction and component function.
- Turbine Systems: Combustion air, ventilation air, instrument air, lubricating oil, hydraulic oil, starting, fuel and anti-surge system, function and operation.
- Control System: Operator interface.
- Control System Operation: VDU mimics, operator panel functions, control system status, warning and shutdown messages.
- Start Sequence: Preparation for starting, running and stopping with associated control messages.
- Governor: Basic function and operation.
- Temperature Monitoring: Basic function and operation.
- Peripheral Equipment: Fire and gas panel, battery charger, motor control centre, driven unit.
- Servicing: Routine maintenance and water wash procedures.
- Monitoring: Data logging and condition monitoring.
- Support Documentation: Operator manual, illustrated parts catalogue, service bulletins and notice to operators.
- Delegate Assessment.

Price: on request NGN (includes a daily meal, coffee, water, cakes, etc...)

Dates: on request

2.2 Control Logix-based PLC Control System

(Code: SPAL-SGTCLPLC-02)

Training Objectives

To provide delegates with a detailed view of the Allen Bradley ControlLogix Control System, its design, major components, programming methods and operation.

Course Structure

The course is designed to provide the course delegate with an understanding of the operation and functioning of the Turbine Control System. This course is provided in our dedicated Control System lecture room equipped with Allen Bradley C/Logix control systems and simulators together with state of- the-art teaching aids. During the course, emphasis is placed on practical exercises to increase the delegate's familiarity with the system. In order to maximize this "hands-on" experience, course numbers are restricted to ensure that one simulator is provided per delegate.

Target Audience

This training course is designed for experienced turbine operators and any technically qualified personnel with knowledge of turbo machinery.

Course Prerequisites

Prior attendance on one of the gas turbine Operation and Maintenance courses or a sound understanding of how a gas turbine and its auxiliary systems operate. PC Literacy - Windows NT.

Conversant with industry standard instrumentation.

Duration

5 days

Location: Siemens Power Academy Lagos

Main Features

- Health, Safety and Environmental (HSE).
- The Siemens Control System Drawings.
- TCM Configuration: Sub-system chassis layout and interfacing (controller, IDS, ECU, vibration monitor, fire & gas, overspeed, watchdog & emergency stop loop).
- Logix Controller Hardware: Function, configuration and status indications.
- Core Engine Controller (CEC): Overview, communications configuration, set-point adjustments and data logging/recovery.
- RSLogix5000 Programming Software:
- I/O configuration, software structure, instructions used by the company (ladder and function block), set point adjustment, trending, loading/ saving software, password protection, forcing I/O points.
- HMI Display: Control mimics, annunciator messages, trending and control options.
- HMI Utilities: Controller set-point adjustment, and output forcing utility.
- Additional Fault Finding Tools: Trending, data logging and controller fault finding.
- Practical Exercises.
- Delegate Assessment.

Price: on request NGN (includes a daily meal, coffee, water, cakes, etc...)

Dates: on request

2.3 Mark 2 Control Systems (All Turbines with a Mark 2 Control System) (Code: SPAL-SGTMK2PLC-03)

Training Objectives

To provide delegates with a detailed view of a Mark 2 Control System, its design, major components, programming methods and operation.

Course Structure

The course is designed to provide the course delegate with an understanding of the function and operation of the Mark 2 Computerised Control System. The course is suitable for Mark 2 Control Systems with or without an Intelligent Display System (IDS). During the course, emphasis is placed on practical exercises to increase the delegate's familiarity with the system. In order to maximize this "hands-on" experience, course numbers are restricted to ensure that one simulator is provided per delegate.

Target Audience

This training course is designed for experienced turbine operators and any technically qualified personnel with knowledge of turbomachinery.

Course Prerequisites

Prior attendance on one of the gas turbine Operation and Maintenance courses or a sound understanding of how a gas turbine and its auxiliary systems operate is recommended.

PC Literacy - Windows NT. Conversant with industry standard instrumentation.

Duration

5 days

Location: Siemens Power Academy Lagos

Main Features

- Health, Safety and Environmental (HSE).
- The Siemens Control System Drawings.
- TCM Configuration: Hardware, power supplies, emergency stop loop, DC lube oil pump control and terminal layout.
- Control Hardware: Card configuration, input/output function, overspeed and watchdog systems.
- Maintenance Terminal: Access, the RP2 menu structure and system parameter adjustment.
- Introduction to the RP2 programming language: The use of basic RP2 commands for maintenance and fault finding.
- Control Mimics and Annunciator Messages.
- Fault Finding Tools: The use of the errorlog, data log and trend logs (if applicable).
- Practical Exercises.
- Delegate Assessment.

Price: on request NGN (includes a daily meal, coffee, water, cakes, etc...)

Dates: on request

2.4 SGT Control System Operation & Maintenance (PCS7) Training (Code: SPAL-CSOMPCS7-03)

Training Objectives

To provide delegates with an operational knowledge of the turbine control system as implemented onto a Siemens SGT product including its major components, user interface and philosophy of operation.

Course Structure

The course is designed to provide the course delegate with an understanding of the operation and maintenance of the turbine control system. This course is provided in one of our dedicated Control System training rooms equipped with Siemens PCS7 control systems and simulators, together with state of- the-art teaching aids. During the course, emphasis is placed on practical exercises to increase the delegate's familiarity with the system. In order to maximize this "hands-on" experience, course numbers are restricted to ensure that one simulator is provided per delegate. Alternatively, the course can be delivered at the customer's preferred onshore location with a control system simulator available for the duration of the course to enhance the learning experience whilst closer to the SGT location.

Target Audience

This training course is designed for experienced turbine operators and any technically qualified personnel with knowledge of control systems PCS7.

Course Prerequisites:

Prior attendance on a Siemens gas turbine operation and maintenance course, giving a sound understanding of how a gas turbine and its auxiliary systems operate, is essential. Conversant with industry standard instrumentation.

Duration

5 days

Location: Training centre Lincoln-UK or on request (Siemens Power Academy Lagos)

Main Features

- Health, Safety and Environmental (HSE): Health and safety awareness with regard to the operation and maintenance of the control system
- The Siemens Control System Drawings:
 - Electrical schematics, P+ID's, Skid wiring drawings
 - UCP Configuration: Sub-system chassis layout and interfacing
 - Controller Hardware: Function, configuration and status indications.
- Auxiliary control systems: Overspeed monitoring, vibration monitoring, fire and gas monitoring
- Turbine Control: Core engine control, package control and sequence control
- HMI Display: Control mimics, annunciator messages and control options
- HMI Utilities: Controller set-point adjustment, Output forcing
- Additional Fault Finding Tools:
 - Trending, data logging and controller fault finding
 - Practical Exercises: Practical exercises to reinforce the skills learnt
- Delegate Assessment

Price: on request NGN (includes a daily meal, coffee, water, cakes, etc...)

Dates: on request

3. Turbo Compressors

3.1. Siemens Turbo compressors: Basic Technology Training TOM

(Code: SPAL-STCTOM-01)

Training Objectives

With a Basic Technology Training TOM (Thermodynamics Operation Maintenance) the attendees can refresh and update general knowledge in the field of turbocompressors and will get knowledge on state-of-the-art technology in the field of turbocompressors.

Course structure

This Basic Technology Training program is designed to instruct customers' personnel in a broad range of subjects, such as basic design of the equipment, principles of compressor operation, instrumentation and specific maintenance. To improve the practical knowledge and to understand the principles of compression processes, the trainees will use our Interactive Compressor Training Program. The program includes the start-up procedure, normal running, troubleshooting and the shut-down procedure. During normal running, the trainee can vary process parameters and study the effect on the compressor performance.

Target Audience

Project managers
Engineers in the industrial business
Experienced operational personnel
Recent graduates
Engineers moving into the industry

Duration

3 days

Location: Siemens Power Academy Lagos

Main Features

- Health, safety, environment
- Compressor design: casing, rotor, impellers, axial thrust compensation, internal and external seals, bearings, couplings, shaft monitoring devices
- Bearings: journal bearing, thrust bearing, troubleshooting, maintenance aspects
- Coupling: types of couplings, misalignment, maintenance aspects
- Dry gas seals: development, gap controlling mechanism, DGS improvements, DGS versus oil seal, groove patterns, pressure distributions, maintenance aspects
- P&I diagrams: principles of diagram, safety and protective system, instrumentation, operational aspects
- Operational aspects: characteristic curves, development of compressor curve, curve slope, operating point versus design point, operating data sheets, operating envelope
- Start-up and shut-down procedures:
- basic safety aspects, general starting preparations, normal running, logic diagrams
- Surge, stall and choke: surge limit, rotating stall, choke limit, cause & effects
- Maintenance: basic aspects, operating data sheets, inspections, cleaning and preservation, health care concepts
- Troubleshooting: cause & effects, rectification
- New developments: remote monitoring, brush seals, magnetic bearings

Price: on request NGN (includes a daily meal, coffee, water, cakes, etc...)

Dates: on request

3.2. Siemens Turbo compressors: Operation - Maintenance - Instrumentation Training (Code: SPAL-STCOMIT-02)

Training Objectives

With a Tailor Made Training course the attendees will get knowledge about safe and effective operation, maintenance and electrical instrumentation & control tailored to the customers' compressor equipment.

Course structure

This training program is designed to instruct customers' personnel in a broad range of subjects, such as basic design of customers' equipment, principles of compressor operation, instrumentation and specific maintenance routines. The topics of this classroom training will be tailored to the customers' needs and specified for customers' equipment. To improve the practical knowledge, the trainees will use our Interactive Compressor Training Program. The program includes the start-up procedure, normal running, troubleshooting and the shut-down procedure. During normal running the trainee can vary process parameters and study the effect on the compressor performance.

Target Audience

Personnel moving into the industry

Experienced operational, maintenance or instrumentation personnel

Recent graduates

Other engineers

We have the ability to structure our training courses to the level of the individual person participating the course.

Duration: 3 days

Location: Siemens Power Academy Lagos

Main Features

- Health, safety, environment
- Compressor design: rotor, impellers, axial thrust compensation, internal seals, external seals, bearings, couplings, monitoring devices
- Dry gas seals: development, gap controlling mechanism, DGS improvements, DGS versus oil seal, groove patterns, pressure distributions, maintenance aspects
- Bearings: journal bearing, thrust bearing, troubleshooting, maintenance aspects
- Coupling: types of couplings, misalignment, maintenance aspects
- Instrumentation: specifications, controllers, how much redundancy, hazard operation
- Performance: characteristic curves, development of compressor curve, curve slope, operating point versus design point, operating data sheets, operating envelope
- Surge, stall and choke: surge limit, rotating stall, choke limit, cause & effects
- P&I diagram: principles of diagram, safety and protective system, instrumentation, operational aspects
- Start-up and shut-down procedures:
 - basic safety aspects, general starting preparations, normal running, logic diagrams
 - Maintenance: basic aspects, operating data sheets, inspections, cleaning and preservation, total care solutions
 - Troubleshooting: cause & effects, rectification
 - New developments: remote monitoring, brush seals, magnetic bearings.
- The above are typical course topics for a combined operation, maintenance and instrumentation training. In any case, the course topics can be adjusted to customers' specification.

Price: on request NGN (includes a daily meal, coffee, water, cakes, etc...)

Dates: on request

3.3. Siemens Turbo compressors: STC-SV and STC-SH Replacement of Dry Gas Seals (Code: SPAL-STCSTC-03)

Training Objectives

With this Hands-On Training customers' personnel will be trained to understand the technology of dry gas seals and to replace them in case of forced shut-down of customers' compressor equipment. Forced down time of customers' plant will be reduced significantly, thus increasing the overall availability of the turbo compressor.

Course structure

This practical training is designed to instruct customers' personnel in subjects, such as basic design of the equipment, principles of compressor operation, dry gas seal technology and all practical procedures to replace dry gas seals. In addition, all handling procedures are trained for peripheral components, like coupling, bearings, barrier seals, shaft monitoring devices, etc. Trainees can exercise on their own at our training modules which represent the original design of turbo compressors.

Target Audience

Experienced maintenance personnel, involved in changing dry gas seals in case of forced shut-down

Duration: 5 days

Location: Training centre in Duisburg, Germany or on Site (if the requested tools are available)

Main Features

- Health, safety, environment
- Compressor design: casing, internal seals, dry gas seals, bearings, couplings, monitoring devices
- P&I diagram: principles of diagram, protective system, instrumentation, operational aspects
- Maintenance: basic aspects, operating data sheets, inspections, cleaning and preservation, maintenance procedures
- Troubleshooting: cause & effects, rectification
- Disassembly and assembly of shaft
- monitoring devices: sensors, handling, adjustment system, system setting
- Disassembly and assembly of
- coupling: disassembly with hydraulic tools, control of coupling seat, tools,
- control measurements, reassembly of coupling, adjustments
- Disassembly and assembly of
- bearings: radial bearing, thrust bearing, tools, control measurements, reassembly of bearing, alignment procedures
- Disassembly and assembly of barrier
- seal: tools, control measurements, assembly procedures
- Disassembly and assembly of dry gas
- seal: driven end seal, non-driven end seal, assembly procedures, tools, control measurements

Price: on request NGN (includes a daily meal, coffee, water, cakes, etc...)

Dates: on request

4. Steam Turbines

4.1. Siemens Industrial Steam Turbines: Basic Technology Training TOM (Code: SPAL-SIST-01)

Training Objectives

With a Basic Technology Training TOM (Thermodynamics Operation Maintenance) the attendees can refresh and update general knowledge in the field of industrial steam turbines and will get knowledge about the most up-to-date findings and technologies in the industrial gas turbine sector.

Course structure

This Basic Technology Training program is designed to instruct customers' personnel in a broad range of subjects, such as basic design of the equipment, principles of gas turbine operation, instrumentation and specific maintenance.

Target Audience

Project managers
Engineers in the industrial business
Experienced operational personnel
Recent graduates
Engineers moving into the industry

Duration: 3 days.

Location: Siemens Power Academy Lagos

Main Features

- Health, safety, environment
- Steam turbine design: casing, rotor, blades, axial thrust compensation, internal seals, external seals, bearings, couplings, monitoring devices, condensing plant
- Bearings: journal bearing, thrust bearing, troubleshooting, maintenance aspects
- Coupling: types of couplings, misalignment, maintenance aspects
- P&I diagram: principles of diagram, safety and protective system, instrumentation, operational aspects
- Operational aspects: steam consumption diagrams, extraction maps, operating point versus design point, operating data sheets, operating envelope
- Condensing plant: condenser types, evacuation systems, safety equipment, instrumentation and control, operational aspects
- Start-up and shut-down procedures:
 - basic safety aspects, general starting preparations, start-up and loading curves, normal running, shut-down
- Maintenance: basic aspects, operating data sheets, inspections, cleaning and preservation, total care solutions
- Troubleshooting: cause & effects, rectification
- New developments: remote monitoring

Price: on request NGN (includes a daily meal, coffee, water, cakes, etc...)

Dates: on request

4.2. Siemens Industrial Steam Turbines: Operation - Maintenance - Instrumentation Training (Code: SPAL-SIST-02)

Training Objectives

With a Tailor Made Training course the attendees will get knowledge about safe and effective operation, maintenance and electrical instrumentation & control tailored to the customers' industrial steam turbine equipment.

Course structure

This training program is designed to instruct customers' personnel in a broad range of subjects, such as basic design of the equipment, principles of industrial steam turbine operation, instrumentation and specific maintenance. The topics of this classroom training will be tailored to the customers' needs and specified for customers' equipment.

Target Audience

Personnel moving into the industry

Experienced operational, maintenance or instrumentation personnel

Recent graduates

Other engineers

We have the ability to structure our training courses to the level of the individual person participating the course.

Duration: 3 days.

Depending on customers' specific requirements, the duration of the training program can be adjusted to 1 to 5 days

Location: Siemens Power Academy Lagos

Main Features

- Health, safety, environment
- Steam turbine design: casing, rotor, blades, axial thrust compensation, internal seals, external seals, bearings, couplings, monitoring devices, condensing plant
- Bearings: journal bearing, thrust bearing, troubleshooting, maintenance aspects
- Coupling: types of couplings, misalignment, maintenance aspects
- P&I diagram: principles of diagram, safety and protective system, instrumentation, operational aspects
- Instrumentation: specifications, controllers, redundancy, hazard operation
- Condensing plant: condenser types, evacuation systems, safety equipment, instrumentation and control, operational aspects, troubleshooting
- Performance: steam consumption diagrams, extraction maps, operating point versus design point, operating data sheets, operating envelope
- Start-up and shut-down procedures:
 - basic safety aspects, general starting preparations, start-up and loading curves, normal running, shut-down
- Maintenance: basic aspects, operating data sheets, inspections, cleaning and preservation, total care solutions
- Troubleshooting: cause & effects, rectification
- New developments: remote monitoring
- The above are typical course topics for a combined operation, maintenance and instrumentation training. In any case, the course topics can be adjusted to customers' specification.

Price: on request (includes daily meal, coffee, water, cakes, etc...)

Dates: on request

4.3. Siemens Industrial Steam Turbines: Hands-On Training (Code: SPAL-SIST-03)

Training Objectives

With this Hands-On Training customers' personnel will be trained to understand the technology of industrial steam turbine generators and drives and will learn how to disassemble/assemble the main components of industrial steam turbines.

Course structure

This practical training is designed to instruct customers' personnel in subjects, such as basic design of the equipment, principles of steam turbine operation. In addition, all handling procedures are trained for peripheral components, like bearings, clearances, sensors, etc. Trainees can exercise on their own at our training modules which represent the original design of industrial steam turbines.

Target Audience

Experienced operational and maintenance personnel

Duration: 5 days

Location: Training centre in Duisburg, Germany or on Site (if the requested tools are available)

Main Features

- Health, safety, environment
- Basic steam turbine design: casing, bearings
- Disassembly and assembly: check of bearings, bump check
- Disassembly and assembly of turbine casing: steam chamber, casing
- Check of clearances: rotor, seals, bearing
- Disassembly and assembly of blade carrier
- Controlling of valves: spindle, cone, bushing
- Disassembly and assembly of bearings: radial bearing, thrust bearing, tools, adjustments, control measurements, reassembly of bearing, alignment
- Maintenance basic aspects: operating data sheets, inspections, cleaning and preservation, maintenance procedures
- Troubleshooting: cause & effects, rectification
- Disassembly and assembly of shaft monitoring devices: sensors, control measurements, assembly procedures

Price: on request (includes a daily meal, coffee, water, cakes, etc...)

Dates: on request

Power Generation Training Offer

1. Operation

Basic Operation Training for Combined Cycle Power Plant (CCPP) (Code: SPAL-BOTCCPP-01)

Training Objectives

Introduction to and basic configuration of the installed systems and components in regard to plant operation
Operational features
Routine maintenance aspects

Course structure

Classroom training and guided discussion.

Target Audience

Power plant operation and maintenance personnel is recommended to participate.

Course Prerequisites:

The participants should be experienced in power plant technology or related areas.

Duration: 5 days

Location: Siemens Power Academy Lagos

Main Features

- General Part (KKS system, Siemens documentation)
- Electrical Part
- I&C-Part
- Gas Turbine Design
- Gas Turbine Operation
- Generator
- Steam Turbine Design
- Steam Turbine Operation
- Water/Steam Systems
- HRSG
- Plant Operation

Price: on request (includes a daily meal, coffee, water, cakes, etc...)

Dates: on request

1.2 Operator Man Machine Interface Training

(Code: SPAL-OMMI-01)

Training Objectives

Hands-on training at operating terminals (OT) with monitoring and process control system using a power plant simulator.

Course structure

Classroom training and practical training

Special equipment will be used to get familiar with the digital control system

Process simulation at a real power plant simulator (generic).

Target Audience

Power plant operators and / or shift engineers.

Course Prerequisites:

Power plant technology or related areas. Participation in the course „Basic Operation Training“ is highly recommended.

Duration: 5 days

Location: Siemens Power Academy Lagos and / or Customer Site

Main Features

- System overview Process Control System
- Overview Automation system
- Process operation with operating terminals (OT's)
- Process monitoring, fault analysis, alarm sequence display
- Controller functions
- Process start-up, operation and shut-down.

Price: on request (includes daily meal, coffee, water, cakes, etc...)

Dates: on request.

1.3 On-the-Job-Training

(Code: SPAL-OTJT-03)

Training Objectives

The operating features as well as the control philosophy will be explained by the commissioning experts using the equipment installed at Site

Course structure

The schedule for the On-the-Job-Training is dependent on the erection and commissioning activities

Target Audience

Power plant operation and maintenance personnel is recommended to participate

Course Prerequisites:

Power plant technology or related areas. Participation in the course „Basic Operation Training“ is highly recommended.

Duration: 5 days

Location: Power Plant Site

Main Features

- System descriptions
- Function and logic diagrams
- Flow diagrams
- Control loop descriptions
- Other product technical documentation

Price: on request (includes daily meal, coffee, water, cakes, etc...)

Dates: on request

2. Maintenance

2.1. Mechanical Maintenance Training (for CCPP)

(Code: SPAL-MMTCCPP-01)

Training Objectives

The trainees shall be introduced to mechanical maintenance activities for selected components supplied by SIEMENS.

Course structure

Product manuals, system descriptions, drawings and maintenance instructions will be used.

Target Audience

Power plant maintenance personnel (mechanical staff)

Course Prerequisites:

Experience in maintenance of power plant technology or related areas Participation in the course „Basic Operation Training“ is recommended.

Duration: 5 days

Location: Siemens Power Academy Lagos or Customer Site

Main Features

- Gas turbine maintenance
- Routine maintenance activities
- Preparations for minor and major overhaul
- Trouble shooting and fault rectification
- Steam turbine maintenance
- Routine maintenance activities
- Trouble shooting and fault rectification
- Preparations for minor and major overhaul
- Generator maintenance
- Routine maintenance activities
- Trouble shooting and fault rectification
- Preparations for minor and major overhaul.

Price: on request (includes daily meal, coffee, water, cakes, etc...)

Dates: on request

2.2. Electrical Maintenance Training (for CCPP)

(Code: SPAL-EMTCCPP-02)

Training Objectives

The trainees shall be introduced to electrical maintenance activities for selected components supplied by SIEMENS.

Course structure

Product manuals, system descriptions, drawings and maintenance instructions will be used.

Target Audience

Power plant maintenance personnel (electrical staff)

Course Prerequisites:

Experience in maintenance of power plant technology or related areas Participation in the course „Basic Operation Training“ is recommended.

Duration: 5 days

Location: Siemens Power Academy Lagos or Customer Site

Main Features

- Start-up frequency converter (SFC)
- Static excitation equipment (SEE)
- Generator
- Trouble shooting and fault rectification
- Spare parts
- Generator protection system
- Transformer

Price: on request (includes daily meal, coffee, water, cakes, etc...)

Dates: on request

2.3. I&C Maintenance Training (Code: SPAL-ICMT-03)

Training Objectives

Introduction to the activities required for maintenance of the instrumentation and control system of SIEMENS

Detection and elimination of faults

Course structure

Classroom training

Practical training using special training equipment

Process simulation.

Target Audience

Power plant I&C maintenance personnel

Course Prerequisites:

The participants should be experienced in I&C automation systems

Participation in the course "Basic Operation Training" is recommended

Duration: 5 days

Location: Siemens Power Academy Lagos or Customer Site

Main Features

- Starting up the automation system (AS)
- Loading of application programs
- Signal tracing
- Fault analysis
- Replacement of modules
- Administration of process management system (OM)
- Analysis of hardware and software errors
- Data archiving, system backup

Price: on request (includes daily meal, coffee, water, cakes, etc...)

Dates: on request

2.4. Fast Digital Control System (FDCS) – Maintenance Training (for CCPP) (Code: SPAL-FDCSMT-04)

Training Objectives

Imparting knowledge of the digital control system used in turbine controllers of SIEMENS

Course structure

Classroom training

Practical training using special training equipment

Target Audience

Power plant I&C maintenance personnel

Course Prerequisites:

The participants should be experienced in I&C automation systems

Participation in the course „Basic Operation Training“ and the I&C maintenance training is recommended

Duration: 5 days

Location: Siemens Power Academy Lagos or Customer Site

Main Features

- Basics of turbine controllers
- Function charts and circuit diagrams
- Cabinet structure and rack arrangement
- Explanation of hardware and software components
- Use of turbine-specific macros
- Programming of memory sub-modules
- Redundancy principle (rack link)
- Signal exchange between the turbine controller and HMI system

Price: on request (includes daily meal, coffee, water, cakes, etc...)

Dates: on request

Renewables

Introduction to Renewable Energy (Code: SPAL-0011-S2)

Training Objectives

At the end of the course participants will be able to:

Understand the basics of how each renewable energy technology works

Distinguish between the main types of renewable energy technology and what each can do

Identify which might be the most appropriate technology for any given scenario

Calculate the likely income stream from the Feed-in-Tariff (FIT) and potential income stream from the Renewable Heat Incentive (RHI)

Make a simple payback calculation for each technology

Target Audience

This course is aimed at procurers, advisors, local authority staff, energy managers, those looking to change career into the renewable energy sector, potential investors and installers and householders who want an introduction to the main building integrated renewable energy technologies.

Prerequisites

No previous knowledge or experience of renewable energy is assumed.

Duration: 1 day

Location: Siemens Power Academy Lagos or Customer Site

Main features

- Solar water Heating
- Wood Fuel Heating
- Ground and Air Source Heat Pumps
- Solar Photovoltaic
- Small to Medium Scale Wind
- Energy Policy and Planning
- Economics

Notes:

This training course provides a great opportunity to learn more about building integrated renewable energy technologies and the impact the Feed-in-Tariff (FIT) and RHI will have on the economics of renewable energy

Price: 50,000 NGN (includes daily meal, coffee, water, cakes, etc...)

Dates: On request

2. Solar Photovoltaic (Code: SPAL-0011-S3)

Training objectives

This course will give you a background on Solar PV; from the types of systems, installation and running issues, to capabilities and limitations. The course will provide an introduction to Solar PV and include examples of how the FIT will affect payback. Different types of surface mounted and integrated Solar PV will be illustrated and their workings explained.

Target audience

This course is aimed at Home owners, Local Authority staff, Architects, Installers, Specifiers, Property Developers, Consultants, Housing Stock Managers and those who need, or want, to have a good understanding of Solar Photovoltaic .

Prerequisites

A basic knowledge or experience of renewable energy is an advantage.

A basic knowledge of electrical engineering will represent an advantage, but it is not compulsory for the participation to the course.

Duration: 1 day

Location: Siemens Power Academy Lagos or Customer Site

Main features

- Benefits of having PV installed
- Types of PV panels
- The market of PV
- Feed-in Tariff
- Sizing and costing
- Safety aspects in case of: a power cut, panel getting damaged, inverter breaking down
- Selling surplus electricity
- Where to go for installations
- Service and maintenance
- Grid integration
- Planning and financing of PV installations.

Notes:

In the frame of this training course, theoretical and deliverable power outputs will be discussed and a rough sizing, costing and investment return (including the impact of the FIT) will be worked through.

Price: 50,000 NGN (includes daily meal, coffee, water, cakes, etc...)

Dates: On request

3. Wind Energy Basics (Code: SPAL-0011-S4)

Training objectives

This course will give you a background on Wind energy and the technology use; from the types of systems, installation and running issues, to capabilities and limitations. The course will provide an introduction to wind, to the energy generation through wind, to the equipment and technologies used and include examples of financial and technical calculations.

Target audience

This course is aimed at Local Authority staff, Architects, Consultants, Managers, investors and those who need, or want, to have a good basic understanding of wind Energy and wind energy generation. This course is also adapted for procurers, advisors, energy managers, those looking to change career into the renewable energy sector, especially wind energy.

Prerequisites

A basic knowledge or experience of renewable energy is an advantage.

A basic knowledge of electrical engineering will represent an advantage, but it is not compulsory for the participation to the course.

Duration: 1 day

Location: Siemens Power Academy Lagos or Customer Site

Main features

- The wind
- Meteorology,
- Generation of wind power
- Technology (specifications, types, components, design, etc..)
- wind turbine sizes and Power ratings
- Wind Energy Resources
- Advantages and disadvantages of wind generated Electricity (resources scarcity, cost issues, life cycle, Pollution , environment, supply and transport issues, etc..)
- Grid integration
- Planning and financing of wind farm.

Notes:

In the frame of this training course, theoretical and deliverable power outputs will be discussed and a rough sizing, costing and investment return (including the impact of the FIT) will be worked through.

Price: 50,000 NGN (includes daily meal, coffee, water, cakes, etc...)

Dates: On request

4. Integration of Distributed and Renewable Power Generation

(Code: 9CA4110-ONE00-ODG1)

Training objectives

The participants will be provided with an objective overview of the design and use of distributed generation technologies and technologies that are based on renewable energy sources, their effects on the power system and aspects that must be considered when integrating these plants into existing network structures.

Target audience

Employees of power generation companies and power supply utilities and Siemens employees who plan and operate power systems. This training is also adapted to employees of the ministry of power and project managers on the field of renewable energy.

Prerequisites

Basic knowledge of electrical engineering.

Duration: 2 days

Location: Siemens Power Academy Lagos or Customer Site

Main features

- General conditions for the use of distributed and renewable generation
- Legislation (German Renewable Energy
 - Sources Act (EEG), German Combined
- Heat and Power Act (KWK), regulation
- Historical development
- Forecasts of future generation scenarios
 - Overview of generation technologies
- Characteristics, fuels, emissions
- Renewable energies (sun, wind, water ...)
- Combined heat and power
- Storage
- Power system connection using converters, synchronous and asynchronous generators
- Economic efficiency of distributed generation
 - Power system integration and impact on the system
- Voltage and Reactive Power Control
- Losses
- Protection system
- Power quality and reliability
- Simulation of practical examples using PSS®SINCAL
- Optimization of plant size and point of interconnection
- Optimum operation of plants from network operation perspective
 - Interconnection conditions
- German Association of Energy and Water Industries (BDEW) guidelines for the connection to low-voltage and medium voltage power systems
- Technical supply conditions (TAB)
- Distribution Code 2007
- Practical examples
 - Outlook – challenges for the future
- “Smart Grids”, “Smart Metering” – concepts
- “Virtual Power Plants”

Price: 200,000 NGN (includes daily meal, coffee, water, cakes, etc...)

Dates: On request

5. Network Integration of Wind Power (Code: 9CA4110-ONE00-0DF6)

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.

Target audience

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. This training is also adapted to employees of the ministry of power and project managers on the field of renewable energy.

Duration: 2 days

Location: Siemens Power Academy Lagos or Customer Site

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
- Behaviour 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 behaviour of wind parks

Price: 200,000 NGN (includes daily meal, coffee, water, cakes, etc...)

Dates: On request

6. Training & Workshop: Solar Energy / Solar power plants (PV Design, Specifications, Planning and Realization) (Code: SPAL-0011-SN2)

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 solar power plants. They will gain also practical experience on how to technically evaluate the most cost effective solution for PV power plants and material. They will receive practical hand on and experience on the PV material.

Target audience

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 PV Modules / Plants. This training is also adapted to employees of the ministry of power and project managers on the field of renewable energy.

Duration: 4 days

Location: Siemens Power Academy Lagos or Customer Site

Main features

- Introduction to the topic Renewable Energy and Solar
- Basic of electricity, Terminology and technical understanding
- Design, dimensioning and realization of solar projects
- PV modules and arrays
- Series and parallel connections and dissimilar module, wiring on PV
- Solar site analysis
- Determine solar access
- Mounting batteries, using meters on modules and batteries
- Wiring module \ batteries in series and parallel
- Estimating electrical load.
- Controllers and inverters
- PV system sizing, stand alone system
- Assembling of components for site installation
- Discussion on components and solar water pumping applications
- PV-grid tied systems
- Types of wire , cables cords and conduit, wire sizing
- Ampacity and voltage drop
- Review installation project and logistics
- Commercial and financial aspects of projects
- Practical (commercial and technical) calculation of a project
- Solar water pumping applications (practicals)
- Hands on installation of PV systems

Notes:

Participants should bring work clothes, caps, sunscreen, etc.... and be prepared to work outside, we will work in teams and go over each aspect of the installation, Costing of PV installation.

Price: 200,000 NGN (includes daily meal, coffee, water, cakes, etc...)

Dates: On request

7. Solar Plants Monitoring - Operation and Maintenance of PV Plants (Code: SPAL-0012-SN3)

Training objectives

The participants will deepen their knowledge of acquisition and communication technologies in industrial environment, focused in solar plants remote control and monitoring.

Target audience

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 PV Modules / Plants. This training is also adapted to employees of the ministry of power and project managers on the field of renewable energy. Engineers and / or technicians working at plants, distribution companies and industry facilities. Planning and operation of power systems responsible personnel.

Prerequisites

Basic knowledge of electrical engineering.

Basic knowledge of solar systems

Duration: 3 days

Location: Siemens Power Academy Lagos or Customer Site

Main features

- Photovoltaic systems
- Photovoltaic systems uses
- Plant components
- Working layout
- Design criteria
- Operation and maintenance
- Photovoltaic plants monitoring
- components monitoring
- Plant data connections
- Monitoring systems
- Remote control
- Effect on operation and maintenance
- Monitoring and remote measurement
- Monitoring levels
- Plant improvement

Price: 300,000 NGN (includes daily meal, coffee, water, cakes, etc...)

Dates: On request

Industrial applications and Systems-Non Siemens Specific

Manufacturing System Process Automation, Operation & Maintenance for Manufacturing Industries (Code: MSPA-OM-MI)

Training objectives

The training program focuses on typical process control system (PCS) applicable in different facilities majorly in the manufacturing/production industries. This course covers function of basic devices for measuring and controlling different kind of variables in process control. It also includes close loop and PID functions, analog & digital devices, programmable logic controllers (PLCs), human machine interface /supervisory control & data acquisition (HMI/SCADA) systems, control panel design and testing and commissioning. ISA instrumentation symbols and interpretation and use of process diagrams are also covered.

Target audience

Personnel from Food & Beverages Industries, Production Industries etc i.e New Recruit Engineers, Control Engineers, Design Engineers, Operators, Maintenance Technicians, Process Engineers, Line Supervisors, Operation Managers, Maintenance Managers

Prerequisites

Basic knowledge of Industrial Automation/Instrumentation

Duration: 10 days

Main features

- Process control system (PCS) overview and applications
- Standards guiding PCS designs; ISA, IEEE, OSHA, NFPA, IEC, etc
- Working with process variables measurement & control in industrial processes
- PLC system overview, configuration, programming and operation
- SCADA/HMI system overview, configuration, programming and operation
- PCS interface with field devices, third party systems & remote I/O system configuration
- PCS control panel design and calculations
- PCS configuration and programming
- PCS system communication protocols; Serial, Ethernet, Controlnet, Devicenet, Modbus, OPC etc
- Testing, System integration and commissioning of PCS system
- Understanding system security
- Troubleshooting & maintenance
- Industrial applications: Automation of conveyors, packaging machines, utilities & tank systems

Price: 525, 000 NGN (includes daily meal, coffee, water, cakes, etc...)

Dates: 23/02-06/03/2015, 26/10-06/11/2015

Production System Operation Monitoring & Control with DCS for Oil & Gas Industries (Code: PSOMC-DCS-OG)

Training objectives

The training provides an understanding of the fundamentals of Distributed Control Systems (DCS). The evolution of computer control systems is discussed and the architecture of contemporary DCS is described in detail. The lesson covers hardware, configuration, data communications, user interface and I/O devices.

Target audience

Personnel from Oil & Gas Industries, Production Industries etc i.e New Recruit Engineers, Control Engineers, Design Engineers, Operators, Maintenance Technicians, Process Engineers, Line Supervisors, Operation Managers, Maintenance Managers.

Prerequisites

Basic knowledge of Control & Instrumentation System in production environment e.g Oil & Gas.

Duration: 10 days

Main features

- Architecture of DCS.
- Advantage of DCS over PLC
- Scope of DCS in the field of Automation.
- DCS system configuration
 - Human interface stations & engineering stations
 - Field control stations
 - Safety control stations
- Working with DCS modules
 - Racks
 - Field control units
 - I/O modules & termination cards
 - DCS communication system protocols
- Networking of automation Station.
- Looping of Power and data bus for various automation
- Common addressing and sharing of I/O channels of automation station.

Price: 525, 000 NGN (includes daily meal, coffee, water, cakes, etc...)

Dates: 16-27/03/2015, 02-13/11/2015

Plant Facility Management & Operation Monitoring with SCADA for All Industries (Code: PFMOM-SCADA-A)

Training objectives

With prior experience in designing basic HMI monitoring system, this course aims to improve the ability of personnel to design more larger system applications which involves wide coverage monitoring system designs, remote monitoring of different plant stations, network application development, multiple clients-server applications, database configuration and reporting system. The class training will be complemented by class workshops, discussion on industry best practices. Students will be issued a certificate at the end of the training.

Target audience

Personnel from various industries e.g Food & Beverages, Oils & Gas, Power, Water, Mining, Manufacturing/Production etc, i.e New Recruit Engineers, SCADA Engineer Control Engineers, Design Engineers, Operators, Maintenance Technicians, Process Engineers, Line Supervisors, Operation Managers, Maintenance Managers.

Prerequisites

Basic knowledge of PLCs, HMI system, control operations etc.

Duration: 10 days

Main features

- Tag management system
- Graphics and animation
- Data acquisition from fields devices on single and multiple stations
- Creating real time and historical trends
- Logic & scripting
- Pre-defined
- User-defined
- Alarms and events management
- Multiple clients – server applications
- Remote monitoring of station SCADA Screen
- Networking monitoring stations
- Data access through external gateways
- Database configuration
- Reporting systems
- Class Industrial Plant Monitoring Projects

Price: 525, 000 NGN (includes daily meal, coffee, water, cakes, etc...)

Dates: 13-24/04/2015, 07-18/08/2015

Plant Automation & Drives Systems Operation & Maintenance (Code: PADSOM-10)

Training objectives

The course has been designed to familiarize Maintenance Engineers with the many different aspects associated with the operation and maintenance of GD2000 AC drives.

Where possible, application specific exercises, actual drawings and programs listings are used to allow the attendees to gain the greatest possible benefit from the course.

Target audience

Personnel from various industries etc i.e New Recruit Engineers, Control Engineers, Design Engineers, Operators, Maintenance Technicians, Process Engineers, Line Supervisors, Operation Managers, Maintenance Managers.

Prerequisites

Basic knowledge of Industrial Automation/Instrumentation.

Duration: One Month

Main features

- Plant automation planning
- Detailed design/requirement analysis of automation & drives solution for plants
- Systems architecture of a typical automated plant
- Requirement & application of VFDs
- Forward & Reverse Control
- Working with major component of automated plant
- Component selection
- Development, setting up, configuration & programming of automated plants
- Settings of VFDs / drive parameters configuration
- Interfacing (wiring) of drives to a plant process control system (PLC, HMI/SCADA)
- Operation optimization
- Control panel design, development & interfacing with automation & drives equipment
- Troubleshooting of automated plants
- Safety at work (protection & trip avoidance) within an automated plant
- Plant start-up and commissioning

Price: 655,000 NGN (includes daily meal, coffee, water, cakes, etc...)

Dates: 01-31/07/2015

Electrical systems (Automation + Power) Operation & Maintenance in Industrial Premises: 3 Month (part-time) Certification Program (Code: IESAP-OP-10)

Training objectives

Personnel from various industries etc i.e New Recruit Engineers, Control Engineers, Design Engineers, Operators, Maintenance Technicians, Process Engineers, Line Supervisors, Operation Managers, Maintenance Managers.

Target audience

Personnel from various industries etc i.e New Recruit Engineers, Control Engineers, Design Engineers, Operators, Maintenance Technicians, Process Engineers, Line Supervisors, Operation Managers, Maintenance Managers.

Prerequisites

Basic knowledge of Industrial Automation/Instrumentation

Basic of Knowledge of power engineering and power systems

Duration: Three Months

Main features

Power systems

- General engineering Course-Power system planning, design and engineering
- Power networks earthing
- Power networks studies : short-circuit calculation, load flow analysis and stability / dynamic studies
- MV switching technology
- MV switching devices and switchgears: basics, technology, design-selection, operation and maintenance (application to Siemens switching devices , NXPlusC and 8DJH)
- SF6 Gas awareness and competence
- MV process oriented engineering- cables testing and diagnostics
- Power distribution systems management and automation
- Fundamentals of protective relaying and protection technology
- Protection techniques for industrial networks (overcurrent, distance, differential, etc.... protection)
- Siprotec 4, practical workshop (hardware and software)
- Relay fault analysis and relay secondary testing
- Distribution transformers: basics -grounding and protection – operation and maintenance
- Basic of substation automation: installation and commissioning
- Power network telecommunication solutions

Automation and drives

- Plant automation planning
- Detailed design/requirement analysis of automation & drives solution for plants
- Systems architecture of a typical automated plant
- Requirement & application of VFDs
- Forward & Reverse Control
- Working with major component of automated plant
- Component selection
- Development, setting up, configuration & programming of automated plants
- Settings of VFDs / drive parameters configuration
- Interfacing (wiring) of drives to a plant process control system (PLC, HMI/SCADA)
- Operation optimization
- Control panel design, development & interfacing with automation & drives equipment
- Troubleshooting of automated plants
- Safety at work (protection & trip avoidance) within an automated plant
- Plant start-up and commissioning

Price: 825,000 NGN (includes daily meal, coffee, water, cakes, etc...)

Dates: May 01-July 31 2015

Smart Grids

Smart Metering - Basis for Smart Grids (40-OWE-NG1)

Training objectives

The participants will understand the concepts and ideas of smart metering which is the fundamental basis of Smart Grid solutions. They will have an overview of the integrated solution (smart metering and distribution network automation in one system) provided by Siemens.

Target audience

Engineers and managers who are engaged in smart metering and who are interested in a complete (smart metering and automation) solution.

Prerequisites

Basic knowledge of electrical engineering.

Duration: 1 Day

Main features

Smart Grids - the requirements on a modern distribution network

Smart Metering - terms, concepts, solutions

AMIS - automatic meter and information infrastructure

- - Meter, load switching devices
- - Data concentrators
- - Telecontrol- and automation system - SICAM 1703
- - Communication
- - Central components (Transactionserver, Networkmanagement, Toolbox II)

Energy IP - Meter Data Management System

- - Introduction into MDM structure
- - Integration into the IT world on the basis of standard processes
- - Meter-to-Bill / Integration to SAP
- - Support during meter deployment and rollout
- - Customer information (EnergyEngage)

Future utility business models

Live presentation of the overall Smart Metering solution.

Price: 50,000NGN (includes daily meal, coffee, water, cakes, etc...)

Dates: 19/03/2015, 22/06/2015, 25/09/2015

Energy Efficiency, Smart Grid and Smart Metering: the future of the Grid (40-0WE-NG2)

Training objectives

The participants will be provided with a comprehensive overview of the design, developments, applications and potentials of smart grid. Also energy professionals in customer service, finance, project management, legal and regulatory departments to better understand the physical, financial and future drivers of the electric power grid thus enabling technical development and improved contribution to the organization.

Target audience

Employees of power generation companies and power supply utilities and Siemens employees who want to get an overview of innovative developments in the energy industry and Professionals in finance, marketing, human resources management, legal – even engineering – who need to understand market drivers and how the electric power systems works.

Prerequisites

Basic knowledge of electrical engineering

Duration: 3 days

Main features

Introduction to electricity systems economics:

- Introduction, Competition, Models of competition
- Fundamental of markets, concepts and types
- Markets for electrical Energy
- Participating in markets for electrical energy
- System security and ancillary services
- Transmission networks and electricity market
- Investing in Generation
- Investing in Transmission
- Answers to selected problems

Introduction to smart grid:

Framework conditions

- - Political, economic, technical
- - European energy policy
- - Potentials and increase of distributed and renewable generation
- - Impact of distributed generation on the power system

What are smart grids?

- - Intelligence in transmission and distribution systems
- - Smart generation
- - Smart consumption

Selected smart grid solutions in transmission and distribution systems

- - Monitoring and remote control of equipment
- - Condition monitoring
- - Automation solutions to increase supply reliability
- - Asset management
- - Blackout prevention
- - Use of power electronics

- - Control of power flows using SIPLINK, FACTS
- - Transmission capacity increase
- - New supply structures, e.g. microgrids

Smart generation

- - Virtual power plants (VPP), decentralized energy management
- - Electric vehicles
- - Battery storage systems

Smart consumption

- - Smart metering
- - Load management
- - Building automation/building management systems

Information and communication technology (ICT)

Experiences from pilot applications and projects

Distributed and renewable power generation - Integration

General conditions for the use of distributed and renewable generation

- - Legislation (German Renewable Energy Sources Act (EEG), German Combined
- - Heat and Power Act (KWK), regulation
- - Historical development
- - Forecasts of future generation scenarios

Overview of generation technologies

- - Characteristics, fuels, emissions
- - Renewable energies (sun, wind, water, ...)
- - Combined heat and power
- - Storage
- - Power system connection using converters, synchronous and asynchronous generators
- - Economic efficiency of distributed generation

Power system integration and impact on the system

- - Voltage and Reactive Power Control
- - Losses
- - Protection system
- - Power quality and reliability
- - Simulation of practical examples using PSS®SINCAL
- - Optimization of plant size and point of interconnection
- - Optimum operation of plants from network operation perspective

Interconnection conditions

- - German Association of Energy and Water Industries (BDEW) guidelines for the connection to low-voltage and medium-voltage power systems
- - Technical supply conditions (TAB)
- - Distribution Code 2007
- - Practical examples

Outlook - challenges for the future

- - "Smart Grids", "Smart Metering" - concepts
- - "Virtual Power Plants"

Price: 150,000NGN (includes daily meal, coffee, water, cakes, etc...)

Dates: 20-22/05/2015, 09-11/11/2015

Registration and Payment

View the catalogue, add course selections by filling out the form below with choice courses selected and proceed to register by sending filled form(s) to: Siemens Limited Nigeria, P.O. Box 304 Apapa, Lagos. It's that simple. Alternatively, return by mail to jane.dalmeida@siemens.com or fax to: +234 (0)14480156.

Please complete the form below or tape your business card to this form.

Name:

Title:

Department:

Company name:

Company address:

Present Portfolio:

Email:

State/City:

Country:

Zip/Postal Code:

Phone: Fax:

♦Please register me.

1. Course name:

Course date: Location:

2. Course name:

Course date: Location:

The Siemens Power Academy's Conditions for Training are acknowledged as having been received and are hereby accepted.

By selecting this box, I accept the Terms and Conditions on pages

Method of payment:

☐ Cheque enclosed

☐ Cash

☐ Purchase Order

♦ Comments:

(include promotional code, dietary restrictions or other comments).

More information:

To receive additional information on Siemens Power Academy program or to update your contact information, please e-mail: jane.dalmeida@siemens.com or jean_matern.aboude_jr.@siemens.com.

Address: Siemens House, Power Academy Lagos 98/100, Oshodi Apapa Expressway, Isolo, Lagos.
Phone: 234(0) 1-4480155, 4480145, Email – jane.dalmeida@siemens.com

General Terms and Conditions for Training at Siemens Power Academy

GENERAL

A. Definitions

"Siemens" shall mean Siemens Power Academy or any member of the Siemens Group of Companies or any joint venture which includes the name "Siemens".

"Purchaser" shall mean the company, firm or persons to whom the offer or quotation is addressed and/or the Company to which the services are to be provided.

"Services" shall mean the training services as agreed between Siemens and the Purchaser.

"Contract" shall mean the agreement between Siemens and the Purchaser for the provision of Services hereunder.

"Party" or "Parties" shall mean Siemens or Purchaser respectively and collectively Siemens and the Purchaser.

B. Conditions part of Contract

Siemens offer/proposal and any resulting contract including these General Terms and Conditions for Training at Siemens Power Academy.

1. Registration

Applications to attend courses must be submitted in writing or electronically using the registration form or log onto the website - www.siemens.com/energy/poweracademy-td. Registrants agree to be bound by these General Terms and Conditions for Training at Siemens Power Academy.

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, Siemens will send an acknowledgement in the form of a provisional notification giving alternative dates. Purchaser shall notify Siemens within 14 days, if it is unable to attend on the suggested alternative date. If Siemens do not hear from the Purchaser within the specified time frame, Siemens shall assume that the Purchaser has accepted the dates proposed by Siemens.

3. Services

3.1 Our services comprise:-

- running training courses;
- providing documentation accompanying the training;
- providing the requisite materials and resources for the training;
- issuing a certificate of attendance. Certificates of attendance are only issued, subject to the participants attending at least 80% of the training course.

3.2. Training course descriptions are accurate at the time they are issued. Siemens 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.

4. Prices and terms of payment

4.1 Training course prices are specified in the descriptions in the catalog and/or offer.

4.2 Unless agreed otherwise, catalog and/or offer prices do not include the cost of accommodation and travel.

4.3 The scope of services and price of customized training courses are specified in the offer.

4.4 Unless agreed otherwise, upon registration of the training course, Purchaser shall be issued with an invoice, which shall be due for settlement within thirty (30) days upon receipt of the invoice. Internal participants shall be invoiced by way of internal procedures on inter-company terms and conditions.

- 4.5 Except as specifically provided elsewhere in the Contract, any duty or tax on any payment to Siemens is not included in the Contract price. The statutory rate of value-added tax shall be added to all prices quoted.
- 4.6 If Customer deducts withholding taxes from payments to Siemens (only to the extent such withholding is required by Law, regulation or directive legally in force at the time of deduction), the Purchaser shall furnish within one (1) month to Siemens, accurate official receipts from the appropriate governmental authority for each deducted or withheld amount.
5. Cancellations by registered participants
- 5.1 Registered participants shall be entitled to nominate alternative participants prior to the commencement of the training course. Siemens 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. For the purposes of this Paragraph, the cancellation date is deemed to be the date of the receipt of a written cancellation by Siemens.
6. Intellectual property and Copyright
- 6.1 Written course materials may not be reproduced for any purpose without the written consent of Siemens and may only otherwise be used for purposes explicitly authorized by Siemens.
- 6.2 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.
- 6.3 All Services provided under this Contract and all materials, documents, products, inventions, works, and deliverables developed, controlled, acquired, prepared or reduced to practice by Siemens under this Agreement are the property of Siemens and all rights and interest therein shall remain in Siemens's ownership. These rights include patent rights, copyright, derivative rights, trade secrets and trademarks.
- 6.4 Purchaser shall have a non-exclusive right to use Siemens's intellectual property developed or prepared under this Agreement for its own purposes, provided Purchaser shall not use these property for purposes unrelated to this Agreement, and will not transfer it to any third Party without the prior written approval of Siemens. This clause shall survive the termination or expiry of this Contract.
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. Participant Pre-Requisites
- Siemens may require that course participants have either a valid software license or be employees of an organization possessing a valid software license for courses dealing with the use of training software. Additionally, Siemens may in its sole discretion exclude participants from any course.

Siemens Limited Nigeria

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