Energizing People  Powering the Future

PC Training Catalog
GE Power Conversion

Lighting the world with the technologies of tomorrow
GE builds industry-leading technologies and integrated solutions that connect brilliant machines, renewables, oil and gas, marine, grids, and systems to power utility and industrial customers in 160 countries while uniting all the resources and scale of the world’s first digital industrial company.
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Fundamentals
Drive Systems

Seminar No. 101
Fundamentals of variable-speed drives

Course Description:
Participants will learn about the selection process for drive systems and explore the basics of drive system engineering mechanical motion, basic models of DC, induction machines and synchronous electrical machines. Participants will learn about inverters with thyristors for DC and AC motors and IGBT converters for AC machines as well as a practical approach for control systems design. Additionally, they will understand the following drive systems: brushless motor, cyclo converter, and frequency converter for variable speed drives and DC drives.

Learning Outcomes:
Fundamental knowledge of the function of the components of electrical drives

Prerequisites:
Fundamental knowledge of basic electrical engineering & electronics

Participants:
Design, commissioning, operation and development engineers

Duration:
Five days
Course Description:
This course introduces the fundamental principles of drive systems. Participants will learn the basics of squirrel cages, doubly fed asynchronous machines, and synchronous electrical machines. They also will learn the fundamentals of electrical machine operation and control, power electronic components and circuits, variable 3-phase voltage sources (pulse pattern generators), voltage source inverters, variable 3-phase current sources, current source inverters, and control of AC variable speed drives.

Learning Outcomes:
Basic knowledge of AC variable speed drives and their application

Prerequisites:
Fundamental knowledge of general electrical engineering

Participants:
Design, commissioning, operation and development engineers

Duration:
Three days
Drive Systems

Seminar No. 103
Power electronics

Course Description:
The aim of this course is to introduce participants to converter technology. This is done through a thorough discussion about power electronics components, AC and DC circuit switching in power electronic applications, and single phase and 3-phase converters. Participants also learn about diode rectifiers, thyristor converters, IGBT two- and three-level inverters, IGBT inverters as front end, and motor converters and pulse pattern generators. Additionally, participants will learn about motor and active front-end control as well as EMC, harmonics, and filters.

Learning Outcomes:
Basic knowledge in effectiveness of drive systems and interaction with other system components

Prerequisites:
Fundamental knowledge of basic electrical engineering

Participants:
Design, commissioning, operation and development engineers

Duration:
Five days
Course Description:
During this course participants will learn about drive trains oscillation analysis (two mass oscillators) and the design of drive trains. They will understand oscillation compensation as also torsion and bending oscillation. The purpose is also to learn about mechanical stimulated periodical noise and oscillations, torque impulse caused by mechanical blocking or electrical short circuit and go through the design of control loops, filter and damping networks for oscillations, oscillation in control loops with back lash, multi mass system and modern control approach for oscillation damping (state space control).

Learning Outcomes:
Basic knowledge about dealing with oscillations

Prerequisites:
Fundamental knowledge of general electrical engineering and control application

Participants:
Design, commissioning, operation and development engineers

Duration:
One day
Seminar No. 105
WNTC-F variable speed drive for direct current motors

Course Description:
During the training the attendees will learn about DC motor reminders, Thyristor bridges and DC motor control principles. They will have an understanding for the range of power, configuration, main components and options of WNCTC-F. Concerning the commissioning part the trainees will learn the method of commissioning, parameterization using the keypad, parameterization using AGILITY software, open loop VVVF control mode, regulation loops setting, detail schematic diagram, software advanced functions, faults and alarms as well as troubleshooting. Remote control using a fieldbus will be also a topic.

This training consists of 50% practical exercises and practical equipment. With two WNCTC-F mock-up equipped with their workstations enables commissioning and use of the WNCTC-F variable speed drive.

Learning Outcomes:
• Understand the variable speed principles applied to the DC motor control
• Be able to commission and start the drive
• Identify and analyze the troubles, and fix them

Prerequisites:
None

Participants:
Commissioning technicians and service personnel

Duration:
5 days
Electrical Systems

Seminar No. 110
Work safety during commissioning and service operations

Course Description:
Seminar participants will learn the procedure of commissioning and service operations out of a work safety perspective. They will be able to apply the safety regulations. In addition, participants will learn how to choose and apply measuring instruments and tools.

Learning Outcomes:
Sensitization of commissioning and service personnel to avoid risks

Prerequisites:
None

Participants:
Commissioning technicians and service personnel

Duration:
2 days
Rotating Machines

Seminar No. 710
Fundamentals of Electrical Motors

Course Description:
This course introduces the fundamental principles of electrical motors. Participants will learn about electromagnetism, rotating fields, induction machines and synchronous electrical machines. Additionally, they will understand the different components of motors, such as bearing units, cooling systems, frames and instrumentation.

Learning Outcomes:
Fundamental knowledge of the function of the components of electrical motors

Prerequisites:
Fundamental knowledge of basic electrical engineering

Participants:
Project managers, buyers, commissioning, operation and maintenance engineers

Duration:
½ day
Automation and Control
Digital control and regulation system Logidyn D2 with LogiCAD

Course Description:
Participants will use a PC with a LogiCAD graphic engineering interface to explore the Logidyn D2 control and regulation system. They will learn system structure, concepts, use, and engineering of the control and regulation system (open-loop and closed-loop). Additionally, participants will learn about commissioning and maintenance of control and regulation structures based on Logidyn D systems. Finally, they will gain an understanding of the configuration and operation of an engineering network system (ENS) and a communication manager (CM) as well as how to connect Logidyn D2 systems to CC100 and RTDB.

Learning Outcomes:
Use of LogiCAD graphic engineering system to implement and maintain solutions to complex control and regulation problems with a Logidyn D system

Prerequisites:
Basic knowledge of analog and digital control systems for automation projects in the field of industrial plants
Use of a PC

Participants:
Project engineers, operation personnel, commissioning and maintenance personnel

Duration:
Five days
Drive Systems

Seminar No. 560
Digital control and regulation system HPCi with P80i

Course Description:
Participants will use a PC with a P80i graphic engineering interface to explore the HPCi control and regulation system. They will learn system structure, concepts, use, and engineering of the control and regulation system (open-loop and closed-loop). Additionally, participants will learn about commissioning and maintenance of control and regulation structures based on HPCi systems (VME and PCI), do applications, and perform backup and version control. They also will gain an understanding of the configuration and operation of an engineering network system (ENS) as well as how to connect HPCi systems to CC100 and EtherCAT.

Learning Outcomes:
Use of graphic engineering system P80i to implement and maintain solutions to complex control and regulation problems with HPCi configuration.

Prerequisites:
Basic knowledge of analog and digital control systems for automation projects in the field of industrial plants
Use of a PC

Participants:
Project engineers, operation personnel, commissioning and maintenance personnel

Duration:
Five days
Seminar No. 572
Automation Products 80/HPCi Level 1

Course Description:
Participants will get to know the P80i/HPCi program. They will learn how to develop and edit P80i, so they are able to install and commission the P80i/HPCi. This training consists 70% practical exercises in which programming will be a topic. Graphic tools and the use of schematics, as well as functional checking, are also a part of the practical exercises. Therefore one HPCi-VME controller, two APC 260 controller and one Rxi controller will be used.

Learning Outcomes:
Know and program the P80i/HPCi

Prerequisites:
None

Participants:
Engineers and technicians from automation department

Duration:
5 days
Seminar No. 575
WAGO Network on Automation

Course Description:
Participants will get to know the characteristics, topology, connecting, hardware and visualization of the network. They will learn how to commission the network and practice on it. This training consists of 70% practical exercises in which programming and commissioning of network WAGO will be trained. Therefore one HPCi controller and one network WAGO 750 +I/O will be used.

Learning Outcomes:
Know and program the P80i/HPCi

Prerequisites:
None

Participants:
Engineers and technicians from automation department

Duration:
1 day
Seminar No. 576
Ethercat Network on Automation

Course Description:
Participants will get to know the characteristics and the configuration of the network. They will learn how to commission it. This training consists 70% practical exercises in which programming will be a topic, as well as installing and using the Ethercat communication network between 1 HPCi and remote I/Os Beckhoff. Therefore one HPCi controller and remote I/Os Beckhoff will be used.

Learning Outcomes:
Know and program the P80i/HPCi

Prerequisites:
None

Participants:
Engineers and technicians from automation department

Duration:
1 days
Seminar No. 577
HPCi & Supervision Communication

Course Description:
Participants will get to know the HMI. They will learn how to install it, configure and use it. This training consists 60% practical exercises in which installation, programming, and test of an application will be trained. Therefore six workstations each equipped with an HMI pack will be used.

Learning Outcomes:
Know the HMI functionalities

Prerequisites:
None

Participants:
Engineers and technicians from automation department

Duration:
5 days
Drive Systems

Seminar No. 650
Engineering with P80-HMI

Course Description:
Interactive training with hands-on exercises. At the end of the course, participants will be able to:

• Understand the structure of P80-HMI
• Install and configure P80-HMI
• Develop objects, graphics and macros
• Use widgets and graphical objects
• Animate widgets and objects

Learning Outcomes:
Participants learn to design plant pictures and programs by using the editors of P80-HMI

Prerequisites:
Basic knowledge using a PC with a graphical surface and basic knowledge in PLS programming.

Participants:
Commissioning and service personnel, project engineers

Duration:
5 days
Seminar No. 580  
**Rxi Controller Overview**

**Course Description:**
This program is an overview of the RXi controller as used on GE Power Conversion HPCI based systems. Participants will learn the functions of the controller connectors and interfacing, and how to set up remote I/O. Controller configuration and flash drive utilities will also be covered.

**Learning Outcomes:**
Controller configuration, interfacing, and maintenance of RXi controller

**Prerequisites:**
- Basic Electronics
- Use of a PC

**Participants:**
- Electrical/Electronic Technicians
- Engineering Personnel

**Duration:**
1 day
Seminar No. 581

P80i Application Overview

Course Description:
This program is an overview of the P80i Software package as used on GE Power Conversion HPCi based Controllers. Participants will learn how to install the package, structure and navigation of the software, how to perform basic editing of programs.

Communications connection to the controller, online functions, and software maintenance will also be covered.

Learning Outcomes:
Software Navigation, Editing, Online Functions of P80i Application

Prerequisites:
RXi / HPCi Controller Overview
Use of a PC

Participants:
Electrical/Electronic Technicians
Engineering Personnel

Duration:
3 days
Low Voltage Drives
Seminar No. 245
MENTOR-MP variable speed drive for direct current (DC) motors

Course Description:
Understand the variable speed principles applied to the DC motor control, be able to commission and start the MENTOR-MP drive, learn how to pilot the DC motor remotely using a fieldbus, and practice identifying, analyzing, and fixing any issues.

This training includes 50% practical exercises and is conducted in a dedicated, comfortable training room stocked with two workstation-equipped MENTOR-MP mock-ups.

Learning Outcomes:
- Commissioning methodology
- Parameterization using the keypad
- Parameterization using CTSoft
- Open loop control mode
- Regulation closed loops setting
- Detailed schematic diagram
- Advanced software functions
- Faults and alarms
- Troubleshooting
- Remote control using a fieldbus
- CAN, PROFIBUS, EtherCAT, Ethernet

Prerequisites:
None

Participants:
Engineers and technicians from maintenance, commissioning, or engineering departments

Duration:
5 days
Seminar No. 250
LV7000 variable speed drive for LV induction motor

Course Description:
Theoretical reminders of the training will be the asynchronous motor. During the general presentation of LV7000 the attendees will learn about the range of power, configuration, main components and options. Concerning the commissioning part the trainees will learn the method of commissioning, parameterization using the keypad, parameterization using NCDRIVE software, open loop VVVF control mode, detail of LV7000 schematic diagram, software advanced functions, faults and alarms as well as troubleshooting. Remote control using a fieldbus will be also a topic.

This training consists of 60% practical exercises and practical equipment. With three LV7000 mock-up equipped with their workstations.

Learning Outcomes:
• Understand the LV7000 principles applied to the AC motor control
• Be able to commission and start the drive
• Identify and analyze the troubles, and fix them

Prerequisites:
None

Participants:
Commissioning technicians and service personnel

Duration:
5 days
251
AC Variable Speed Drives MV3000

Course Description:
Basic theory of AC motors and drives, drive components, drive controls and communication, system alarms and maintenance.

Learning Outcomes:
Ability to perform maintenance, identify faults units and replace with onboard spares. Exercises utilizing drive control and motor mock-up equipment will enhance ability to monitor, control and maintain the system.

Prerequisites:
Basic understanding of electrical systems, control theory and experience of maintaining drive systems

Participants:
Technicians, Engineers and Electricians

Duration:
3 days
Seminar No. 262
LV7000 processing lines

Course Description:
The purpose of this course is to introduce participants to the fundamentals of frequency converter – product number LV7000. During this training program, participants get a briefing on the control panel/keypad and an in depth explanation of the parameter tree structure in the NC-Drive. In addition they will get training for NC-Drive and NC-Load, learn about the installation of Service CANBUS for the LV7000, get insights about faults and warnings for NC-Drive and NC-Load and get an explanation of the reference cascade and load balance.

Learning Outcomes:
Handling and optimization of LV7000

Prerequisites:
Use of a PC
Knowledge of 3-phase technology and asynchronous machines

Participants:
Commissioning engineers, commissioning technicians and service personnel

Duration:
Five days
Seminar-Nr. 271
MD2000

Course Description:
This course covers the fundamentals of 3-phase technology with a constant voltage link circuit and MD2000 operating principles.

Participant teams will work together to find faults, do troubleshooting and re-commissioning, and handle the ALSPA PCS-Software.

Learning Outcomes:
Independent commissioning and fault finding

Prerequisites:
Knowledge of 3-phase technology and asynchronous machines

Participants:
Commissioning engineers, commissioning technicians and service personnel

Duration:
4 days
Drive Systems

Seminar No. 272
ProWind and MD2000

Course Description:
This course covers the fundamentals of 3-phase technology with a constant voltage link circuit as well as the ProWind and MD2000 operating principles in wind power units. Participant teams will work together to find faults, do troubleshooting and re-commissioning, and use the PC Drive software.

Learning Outcomes:
Independent commissioning and fault finding

Prerequisites:
Use of a PC
Knowledge of 3-phase technology and asynchronous machines

Participants:
Electrical personnel for service, commissioning and maintenance on WPU

Duration:
Five days

“Well-structured training in a great facility”
– Martin Matousu, Nordex
Drive Systems

Seminar No. 274
ProWind with PECe

Course Description:
Participants will learn the fundamentals of 3-phase technology with a constant voltage link circuit as well as how to use ProWind and PECe to control wind power unit operation. Course participants will work in teams to learn about fault finding, troubleshooting, re-commissioning, and PECe control software. Additionally, they will explore how to perform power circuit breaker inspections and maintenance.

Learning Outcomes:
Independent commissioning and fault finding

Prerequisites:
Use of a PC
Knowledge of 3-phase technology and asynchronous machines

Participants:
Electrical personnel for service, commissioning and maintenance on WPU

Duration:
Five days

“Well above my expectations for a training center and far beyond any training I have previously had”
– Aaron Griffiths, Nordex
Drive Systems

Seminar No. 275
LV5 Solar

Course Description:
This program introduces the basic principles of converter operation. Participants will learn about converter structure and hardware components, HDM basic principles (such as handling, operational characteristics, maintenance, and safety), HPCi Data Manager, and fault detection and diagnosis.

Learning Outcomes:
Handling, Diagnostics, Maintenance

Prerequisites:
Electrical education
Knowledge of 3-phase technology and solar generators
Use of a PC

Participants:
Electrical personnel for service, commissioning and maintenance on solar systems

Duration:
Four days
Seminar-Nr. 285
LV8000

Course Description:
Interactive training with hands-on exercises focusing on fault diagnosis and troubleshooting.

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

• Explain the hardware components in detail.
• Understand and configure the PC-Software HDM-Manager.
• Conduct fault finding and troubleshooting.

Learning Outcomes:
Independent working with HDM-Manager-Software, fault tools and fault finding

Prerequisites:
• Usage of a PC
• MS-Windows-Knowledge

Participants:
Commissioning engineers, commissioning technicians and service personnel

Duration:
5 days
Medium Voltage Drives
Drive Systems

Seminar No. 293
MV7000 (medium voltage converter) with basics of HPCi/control hardware with PECe + PIBe

Course Description:
This course covers 3-phase technology HPCi system structure, concepts, and use. Participants will learn about the MV7000’s 3-phase technology with a voltage link circuit, as well as principles of operation, how to handle medium voltage technology units, how to download and back up HPCi controller drive software, and fault finding, troubleshooting and maintenance.

Learning Outcomes:
Independent fault finding and maintenance

Prerequisites:
Use of a PC
Knowledge of 3-phase technology and asynchronous machines

Participants:
Commissioning engineers, commissioning technicians and service personnel

Duration:
Five days
Seminar No. 298
SD 7000 variable speed LCI drive for MV SYNC motor - Control with PECe system

Course Description:
This training has five main parts. The first part will cover theoretical reminders. A general presentation of SD7000 will follow. After that, the operating principle of the SD7000 VSD will be explained. The attendees will get a presentation of SD7000 PECe CONTROL and finally apply SD7000. This training consists of 40% practical exercises in which the use of a SD7000 PECe application through the P80i tool and settings of SD7000 piloting synchronous motor are core parts. Therefore a SD7000 mock-up equipped with its workstation will be used.

Learning Outcomes:
• Understand the SD7000 principles applied to the SYNCHRONOUS motor control
• Know the PECe control system using P80i tool
• Know and use the PECe dialog tools

Prerequisites:
P80i knowledge is recommended

Participants:
Engineers/technicians from maintenance, commissioning or engineering departments

Duration:
5 days
Seminar No. 304
MV6000 variable frequency drive for MV AC motor with PECe control system

Course Description:
This training has five main parts. The first part will cover theoretical reminders. A general presentation of MV6000 will follow. After that, the MV6000 PECe control system will be presented. During the third part the attendees will learn how to apply the MV6000. This training consists of 40% practical exercises in which the use of a MV6000 PECe application through the P80i tool and piloting an AC motor are core parts.

Learning Outcomes:
• Understand the MV6000 principles applied to the AC motor control.
• Know the PECe control system using P80i tool.
• Know and use the MV6000 dialog tools.

Prerequisites:
P80i knowledge is recommended.

Participants:
Engineers/technicians from maintenance, commissioning or engineering departments.

Duration:
5 days
Seminar No. 350
SEMIPOL: Startup Frequency Converter and Static Excitation Equipment (SFC/SEE)

Course Description:
Interactive training with hands-on exercises focusing on control software, operations and trouble shooting.

Learning Outcomes:
- Introduction to SFC/SEE system.
- Training on Thyristor Converter Technology and LCI topology.
- Operate and handle SEMIPOL (SFC/SEE).
- Training in hardware and print boards.
- SFC startup process and power optimization—SEE excitation optimization.
  - Introduction to commissioning procedure.
  - Practical exercises on test models in GTLC.
  - Software handling and practical exercises.
  - Maintenance and troubleshooting.

Prerequisites:
General electrical background, basic computer skills, knowledge of 3-phase technology and synchronous machines.

Participants:
Commissioning technicians and service personnel.

Duration:
5 days
Drive Systems, Seminar No. 355
ProCrane – Operations and Maintenance

Course Description:
Participants will learn the fundamentals of crane drive technology. Based on practical exercises, participants will learn how to diagnose and fix common faults, maintain and operate the drive using control software, and apply best practices.

After the training, participants will be able to conduct relevant maintenance tasks and to identify and fix common faults.

Learning Outcomes:
Independent maintenance, fault-finding, and troubleshooting

Prerequisites:
• Use of a PC
• Basic knowledge of power electronics technology

Participants:
Electrical personnel for service and maintenance

Duration:
5 days
Seminar No. 570
PECe DC variable speed drive for direct current motors - Control with PECe system

Course Description:
After some theoretical reminders concerning DC motor, thyristor bridges, and DC motor control principles, the PECe DC control will be presented. Participants will learn about the application structure, test modes, and Perturbography. They will be able to apply PECe DC. This training consists of 50% practical exercises in which the configuration and use of commands as well as the use of P80i can be trained. Therefore, two PECe DC mock-ups will be used.

Learning Outcomes:
• Understand the variable speed principles applied to the DC motor control
• Know the PECe control system for DC application using P80i
• Know and use the PECe dialog tools

Prerequisites:
P80i knowledge is recommended

Participants:
Engineers/technicians from maintenance, commissioning or engineering departments

Duration:
5 days
Rotating Machines
Alignment

Course Description:
The aim of this course is to introduce participants to alignment. They will learn about shaft line, static and dynamic motor behavior on cold and hot status, and methods used to align electrical motors. They will discuss tolerances, couplings (elastic, semi-elastic, rigid), coupling hub fitting and extraction. This course is led by a test bench mechanical expert.

Learning Outcomes:
Fundamental knowledge in motor alignment

Prerequisites:
Basic knowledge in mechanical engineering

Participants:
Mechanical maintenance and commissioning engineers

Duration:
1 day
Rotating Machines

Seminar No. 712
Installation & Commissioning

Course Description:
This course covers GE recommendations when installing an electrical motor on skid or grouting. Participants will learn about cable trays, cable glands and terminal boxes. They will also discuss customer energy connections (water, oil, air). The purpose is to also learn about preliminary checks before tests (lubrication, cooling system), and no-load and load tests. Participants will explore how to perform measurement analysis, check efficiency and consumption. The goal is to discuss and understand vibrations and noises.

Learning Outcomes:
Best practices for installing a motor and basic knowledge for start-up assistance

Prerequisites:
Fundamental knowledge in mechanical and electrical engineering

Participants:
Operation, commissioning and maintenance engineers

Duration:
1.5 day
Rotating Machines

Seminar No. 721
Exciters and Excitation Panels

Course Description:
Seminar participants will learn about different types of exciters and subcomponents like rectifier and diode block assembly. Additionally, they will understand how the cooling system works, AVR (Automatic Voltage Regulator) functions, protection and starting logical.

Learning Outcomes:
Basic knowledge of the function of exciters and excitation panels

Prerequisites:
Basic knowledge in cabling, electrical and electronic engineering

Participants:
Project managers, buyers, commissioning, operation and maintenance engineers

Duration:
1 day
EX Environment and Pressurization System

Course Description:
This program introduces current regulations related to the different types of motor protection (exe, exd, exp) as well as the EX environment and precautions related to the environment. During this course, participants will learn about motor protection and the environment, purging systems, leakage compensation and trips.

Learning Outcomes:
Basic knowledge in explosive environment and purge units

Prerequisites:
Basic knowledge in electrical and pneumatic engineering

Participants:
Operation, commissioning and maintenance engineers

Duration:
½ day
Seminar No. 740
Life Cycle Management

Course Description:
This course covers preventive and curative maintenance with three levels of maintenance, spare parts management (consumables, capital spares), GE recommendations, recording and monitoring, and spare motors.

Learning Outcomes:
Fundamental knowledge of the maintenance of motors

Prerequisites:
Basic knowledge in industrial maintenance

Participants:
Maintenance engineers

Duration:
1 day
Rotating Machines

Seminar No. 741
Troubleshooting

Course Description:
During this course, participants will understand electrical and mechanical issues, how to get the data and perform an AMDEC analysis, 5W, tests and checks campaigns.

Learning Outcomes:
Basic knowledge in diagnostics and analysis of motor troubleshooting

Prerequisites:
Fundamental knowledge in electrical and mechanical engineering

Participants:
Operation, commissioning and maintenance engineers

Duration:
1 day
Seminar No. 742
Vibrations

Course Description:
The aim of this course is to understand what is a vibration, where it comes from, why it is generated and how to measure it (methods of measurement on electrical motors). Additionally they will explore instrumentation such as speed sensors, vibrations sensors, and velocimeters—and discuss data analysis through spectra, waterfalls, bodes, and orbits.

Learning Outcomes:
Basic knowledge in vibration measurements and analysis

Prerequisites:
Fundamental knowledge in mechanical engineering

Participants:
Operation, commissioning and maintenance engineers

Duration:
1 day
Seminar No. 750
In-Depth Generator Training

Course Description:
This course covers:

• Generator operating principles, inside-out build and components.
• Generator excitation, synchronization, operation modes (island/grid) and protection relaying.
• Generator maintenance practices, analysis of results and typical internal failure modes.

Learning Outcomes:
In-depth understanding of generator assembly and operating principles, grid operation and typical maintenance program.

Prerequisites:
Basic knowledge of three-phase rotating machines technology and operating principles.

Target Audience:
Plant managers, plant operators and service technicians.

Duration:
5 days
Marine
M031 Advanced Training Course on Real-Time Simulator (RTLAB)

Course Description:
This advanced course uses extensive hands-on training through real-time simulation and troubleshooting on control and power sides. The course adapts the same architecture as that existing onboard, when possible.

Learning Outcomes:
Students will simulate and troubleshoot the power part of the customer system using a real-time simulator at the Belfort facilities.

Prerequisites:
Basic knowledge of electrical engineering and electronics; use of a personal computer

Participants:
From junior to expert level

Duration:
Based on customer need
Power Systems

M400

Power Systems
(Marine and Offshore)

Course Description:
This course covers vessel power systems in use in the offshore industry—from the requirements of shipyards, owners, operators and classification societies, to the solutions in place for the power generation and distribution systems of offshore vessels—particularly vessels with Dynamic Positioning systems.

The whole range of equipment is covered, from engines, generators and other electrical equipment (LV or HV) to its control and automation. Trainees will develop an understanding of the reasons for equipment choice, settings, functionality and operation and—importantly—the interactions between different parts of the system and how this affects them.

Learning Outcomes:
To gain an insight into the operation, functionality and design principles of offshore power systems to enable trainees to operate and maintain their systems safely and competently, and to undertake first line fault finding, so reducing downtime and improving safety.

Prerequisites:
Electrical engineering background; Staff attending should be familiar with vessel operational procedures.

Participants:
Onshore electrical support and engineering staff; vessel electrical and electronic staff; shipyard electrical design staff.

Duration:
4 days
Marine

Dynamic Positioning
Dynamic Positioning (DP)

**M401**
Dynamic Positioning Induction (Basic)

**Course Description:**
DP Basic Induction is the first of two courses provided by The Nautical Institute in the Dynamic Positioning Training Scheme. It is a 28-hour, 4-day course, which focuses on the theoretical basis of Dynamic Positioning. DP Trainees are instructed in the elemental components of DP, and its myriad uses in the offshore environment. Practical exercises are conducted on GE C-Series Workstations, through which DP Trainees become familiar with the structure of Dynamic Positioning software, and the application thereof to differing operational and environmental constraints.

**Learning Outcomes:**
Introduction and principles of operation, elements of DP systems, system operation and control modes, sensor inputs, thrusters and power generation, vessel capabilities, control console and displays, along with DP workstations practical exercises.

**Prerequisites:**
Licensed Deck Officer or Deck Cadet

**Participants:**
STCW- or Nationally-Licensed Deck Officer or Maritime Academy Cadet currently attending but not yet qualified for officer tests; Vessel Masters, Mates, Pilot Association members, Deck Cadets, DP Operators and other personnel associated with the day to day operation of DP systems

**Duration:**
4 days
Dynamic Positioning (DP)

M402
Dynamic Positioning Simulator (Advanced)

Course Description:
DP Advanced Simulator is the second course in the DP Training Scheme by The Nautical Institute. It is a 28-hour, 4-day course, which focuses nearly entirely on the practical application of Dynamic Positioning utilizing GE Marine's Class-A Simulator. Through a series of simulator exercises, DP Trainees learn detailed operations planning, weather observation, power management stratagem, Blackout Recovery methods, DP incident mitigation and many other skills necessary to being a valuable member of the Bridge Team. Exercise time spent entering the 500-Meter Zone is minimal; emphasis is placed on DP Operations.

Learning Outcomes:
DP system and vessel safe operational procedures, system alarm messages, DP system setup, as well as power generation faults, failures and safe operation. The course includes DP system simulator exercises, involving different vessels and types of operations.

Prerequisites:
STCW- or Nationally-Licensed Deck Officer or Maritime Academy Deck Cadet currently attending but not yet qualified for officer tests

Participants:
STCW- or Nationally-Licensed Deck Officer or Maritime Academy Cadet currently attending but not yet qualified for officer tests; Vessel Masters, Mates, Pilot Association members, Deck Cadets, DP Operators and other personnel associated with the day to day operation of DP systems

Duration:
4 days
Dynamic Positioning (DP)

M403
Dynamic Positioning Seatime Reduction

Course Description:
DP Seatime Reduction is a 38-hour, 5-day course, which puts DP Operator Trainees through continual, intense exercises going beyond those to which they are exposed in the DP Advanced Simulator course. Emphasis is placed on the DP Trainee understanding that they, as the DPO, are the most important component of the DP System. Through tasks focusing on risk mitigation, the DP Trainee learns that Dynamic Positioning cannot be undertaken as a reactionary endeavor, and they complete the course recognizing the full scope of responsibilities of the DPO.

Learning Outcomes:
The reiteration of training and seatime is costly to companies and individuals alike. If a Full or Limited DP Certificate has not been issued within the 4- or 5-year time period, it is mandated that the DP Trainee repeat any and all courses and seatime set to expire, costing the DP Trainee and his company that much more time. To preclude this expiration, five days spent in DP Seatime Reduction is deemed equal to 30 DP Seatime days, bringing the DP Trainee that much closer to completing the lengthy DP Training Scheme.

Prerequisites:
STW- or Nationally-Licensed Deck Officer; Completed DP Basic Induction and DP Advanced Simulator

Participants:
Vessel Masters, Mates, Pilot Association members, Deck Cadets, DP Operators and other personnel associated with the day to day operation of DP systems

Duration:
5 days
Dynamic Positioning (DP)

M404
Dynamic Positioning Software Familiarization

Course Description:
DP Software Familiarization can be booked for either C-Series or GE Seastream* software. This course is intended for persons with an interest in the user interface of GE Dynamic Positioning Systems.

Learning Outcomes:
Introduction and principles of operation, control console and displays, along with DP workstation practical exercises.

Prerequisites:
Basic understanding of DP systems

Participants:
This course can easily be adapted to the target audience, ranging from operators who are looking to improve their knowledge of the system to other personnel who would like to have a better understanding of DP operations but have little to no operational experience

Duration:
2 days
Dynamic Positioning System Maintenance

Course Description:
The DP System Maintenance course is designed for all personnel who troubleshoot and maintain GE DP equipment.

Learning Outcomes:
Theory of system operation, hardware architecture, sensors, networking, serial communication, alarms and troubleshooting, wiring diagrams, as well as hands on troubleshooting exercises, utilizing consoles and thruster field station simulation.

Prerequisites:
Basic understanding of electrical or low voltage electronics, Networking standards (ex. TCP/IP), NMEA sensor standards 0183 (Serial) and 2000 (Ethernet), and basic control theory

Participants:
Technicians, Vessel Assistant and Chief Engineers, Port Engineers, Maintenance Supervisors and Engine Cadets

Duration:
4 days
Dynamic Positioning

M100 / M100-T
Dynamic Positioning (DP) and Automation Maintenance
(DP-TAMS option available: M100-T)

Course Description:
This course covers the Dynamic Positioning and Automation systems in place on offshore vessels, with an emphasis on diagnostics and fault-finding procedures, to suit the needs of technical and maintenance staff. The DP-TAMS option covers the DP and Automation systems as relevant to vessels with Thruster-Assisted Mooring Systems (DP-TAMS).

Learning Outcomes:
To gain an insight into the workings of the Dynamic Positioning control and Automation systems for a specified vessel; to aid staff in fault diagnosis and general maintenance of the system.

The primary aim of all courses is to improve the safety and reliability of DP operations through the increased knowledge and competence of key DP personnel.

Prerequisites:
General electrical background, basic computer skills. Staff attending should be familiar with vessel operational procedures.

Participants:
Maintainers of GE Power Conversions/Converteam's Dynamic Positioning (DP or DP-TAMS) and Integrated Automation System (IAS)/Automatic Vessel Control (AVC) systems; Vessel operating staff of such IAS/AVC systems; typically engineering and electrical staff, electro-technical officers (ETOs).

Duration:
3 days
Dynamic Positioning

M101 / M101-T

Dynamic Positioning (DP) and Automation Operator Familiarization (DP-TAMS option available: M101-T)

Course Description:
This course covers the Dynamic Positioning and Automation systems in place on offshore vessels, with an emphasis on operational aspects.

The Dynamic Positioning section provides familiarization training for operators using GE dynamic positioning systems. This includes how to carry out the various tasks required of a dynamic positioning operator (DPO) using the GE system, with the external simulator used for visualization. Courses focus on the “how” rather than the “when” or “why” of DP operation.

The Automation (IAS/AVC) section provides familiarization for operators and engineers using the GE Automation system, looking at both general operational principles and at diagnostics and fault-finding facilities. The DP-TAMS option covers the DP and Automation systems as relevant to vessels with Thruster-Assisted Mooring Systems (DP-TAMS).

Learning Outcomes:
To gain an insight into the operation and control functions of the Dynamic Positioning and Automation control systems for a specified vessel.

The primary aim of all courses is to improve the safety and reliability of DP operations through the increased knowledge and competence of key DP personnel.

Prerequisites:
Staff attending should be familiar with DP principles and vessel operating procedures.

Participants:
Operators of GE Power Conversion/Converteam’s AMC-based Dynamic Positioning (DP or DP-TAMS) and Integrated Automation System (IAS)/Automatic Vessel Control (AVC) systems.

Duration:
3 days
Dynamic Positioning

M102 / M102-T

Dynamic Positioning (DP) Maintenance
(DP-TAMS option available: M102-T)

Course Description:
This course covers the Dynamic Positioning systems in place on offshore vessels, with an emphasis on diagnostics and fault-finding procedures, to suit the needs of technical and maintenance staff. The DP-TAMS option covers DP systems as relevant to vessels with Thruster-Assisted Mooring Systems (DP-TAMS).

Learning Outcomes:
To gain an insight into the workings of the Dynamic Positioning control systems for a specified vessel; to aid staff in fault diagnosis and general maintenance of the system.

The primary aim of all courses is to improve the safety and reliability of DP operations through the increased knowledge and competence of key DP personnel.

Prerequisites:
General electrical background, basic computer skills. Staff attending should be familiar with vessel operational procedures.

Participants:
Maintainers of GE Power Conversion/Converteam's AMC-based Dynamic Positioning (DP or DP-TAMS) systems; typically electro-technical officers (ETOs), engineering and electrical staff.

Duration:
2 days
Course Description:
This course covers the Dynamic Positioning systems in place on offshore vessels, with an emphasis on operational aspects.

The course provides familiarization training for operators using GE Dynamic Positioning systems. This includes how to carry out the various tasks required of a dynamic positioning operator (DPO) using the GE system, with the external simulator used for visualization. Courses focus on the “how” rather than the “when” or “why” of DP operation. The DP-TAMS option covers DP systems as relevant to vessels with Thruster-Assisted Mooring Systems (DP-TAMS).

Learning Outcomes:
To gain an insight into the operation and control functions of the Dynamic Positioning (DP or DP-TAMS) control systems for a specified vessel.

The primary aim of all courses is to improve the safety and reliability of DP operations through the increased knowledge and competence of key DP personnel.

Prerequisites:
Staff attending should be familiar with DP principles and vessel operating procedures.

Participants:
Operators of GE Power Conversion/Converteam’s AMC-based Dynamic Positioning (DP or DP-TAMS) systems.

Duration:
2 days
Operator Familiarization

M105
Dynamic Positioning (DP)
Operator Familiarization and Maintenance Overview

Course Description:
This course provides familiarization training for operators using GE Dynamic Positioning (DP) systems. This includes how to carry out the various tasks required of a dynamic positioning operator (DPO) using the GE system, with the external simulator used for visualization. Courses focus on the “how” rather than the “when” or “why” of DP operation.

The course also covers aspects related to maintenance and system diagnostics; it enables understanding of the control system, the procedures necessary for fault finding, and how to capture vessel data in order to maximize the effectiveness of support from GE.

Learning Outcomes:
To gain an insight into the operation and control functions of the Dynamic Positioning control system for a specified vessel; to aid the operator in the operation of the system and the engineer in fault diagnosis and general maintenance of the system.

The primary aim of all courses is to improve the safety and reliability of DP operations through the increased knowledge and competence of key DP personnel.

Prerequisites:
General electrical background, basic computer skills. Staff attending should be familiar with vessel operational procedures.

Participants:
Maintainers and operators of GE Power Conversion/Converteam’s AMC-based Dynamic Positioning (DP or DP-TAMS) control systems; typically engineering and electrical staff, electro-technical officers (ETOs), DPOs; technical superintendents and project engineers.

The course is especially relevant to operators who need to know more about the hardware and system architecture, and to technical staff who need to have a greater understanding of DP operation.

Duration:
3 days
Operator Familiarization

M106
Dynamic Positioning Scenario/Incident (non-NI)

Course Description:
This course provides students the opportunity to practice handling specific situations associated with vessels and operations and to reflect on their performance. Generic or customer-specific Dynamic Positioning situations, scenarios and real Dynamic Positioning incidents are used to build on existing experience using our advanced DP system simulator with highly experienced Dynamic Positioning Operator instructors.

Learning Outcomes:
DP Operators will be better equipped with knowledge, skills and experience to react appropriately to non-routine situations and make sound judgments in complex circumstances. The primary aim of all courses is to improve the safety and reliability of DP operations through the increased knowledge and competence of key DP personnel.

Prerequisites:
Staff attending should ideally be familiar with DP principles and vessel operating procedures.

Participants:
Dynamic Positioning Operators.

Duration:
3 days
Marine
Synchronous and Asynchronous Motors
PEC(E) Control

M011 SD7000
Synchronous Inboard Motor

Course Description:
This Synchronous Inboard Motor course provides participants with an understanding of their Electrical Propulsion System (EPS) and the technology used on board. The course also covers system configuration and setup.

Learning Outcomes:
Course attendees will learn the fundamentals of electrical drive, control, automation, network, HMI, and motor operation.

Prerequisites:
Basic knowledge of electrical engineering and electronics; use of a personal computer

Participants:
From junior to expert level

Duration:
3 days
Course Description:
This Synchronous POD Motor course covers the architecture and technology used aboard your Electrical Propulsion System (EPS). Participants also will learn about system configuration and setup as well as the POD sub-equipment and operating system.

Learning Outcomes:
Participants will be introduced to the basics of electrical drive, control, automation, network, HMI, motor, and POD operation.

Prerequisites:
Basic knowledge of electrical engineering and electronics; use of a personal computer

Participants:
From junior to expert level

Duration:
3 days
PEC(E) Control

M013 MV7000 PWM Drive
Asynchronous Inboard Motor

Course Description:
This Asynchronous Inboard Motor course provides an understanding of the architecture and technology used aboard your Electrical Propulsion System (EPS). In addition, participants will learn about system configuration and setup.

Learning Outcomes:
Attendees will gain a basic knowledge of electrical drive, control, automation, HMI, and motor operation.

Prerequisites:
Basic knowledge of electrical engineering and electronics; use of a personal computer

Participants:
From junior to expert level

Duration:
3 days
PEC(E) Control

**M014 MV7000 PWM**

Asynchronous POD Motor

**Course Description:**
This Asynchronous POD Motor course provides participants with an understanding of the architecture and technology used aboard their Electrical Propulsion System (EPS). The course also covers system configuration and setup as well as information related to the POD sub-equipment and operating system.

**Learning Outcomes:**
Course attendees will learn the basics of electrical drive, control, automation, HMI, motor, and POD operation.

**Prerequisites:**
Basic knowledge of electrical engineering and electronics; use of a personal computer

**Participants:**
From junior to expert level

**Duration:**
4 days
OPSY Technology

M017 ONYX PWM Drive
Synchronous POD Motor

Course Description:
This Synchronous POD Motor course provides participants with an understanding of the architecture and technology used aboard their Electrical Propulsion System (EPS). The course also covers system configuration and setup as well as the POD sub-equipment and operating system.

Learning Outcomes:
Attendees will gain basic knowledge about electrical drive, control, automation, network, HMI, motor, and POD operation.

Prerequisites:
Basic knowledge of electrical engineering and electronics; use of a personal computer

Participants:
From junior to expert level

Duration:
4 days
PEC(E) Control

M022 MV7000 PWM Drive
Asynchronous POD & Inboard Motor

Course Description:
This Asynchronous POD and Inboard Motor course covers suggested equipment maintenance practices as well as operation and troubleshooting.

Learning Outcomes:
Course participants will learn the basics of maintenance on the strategic equipment supplied by GE. The course also covers issue identification and troubleshooting through exercises and procedures related to replacing equipment, reloading software and explaining safety rules.

Prerequisites:
Basic knowledge of electrical engineering and electronics; use of a personal computer

Participants:
From junior to expert level

Duration:
3 days
Marine

Automation System
Operator Familiarization

M107
Automation System
Operation – Drilling Systems

Course Description:
This course covers the Automation systems in place on offshore drilling vessels, with a focus on the principles and operation of the Automatic Vessel Control (AVC), Power Management (PMS) and Drilling Drives systems.

Learning Outcomes:
To gain an insight into the operation and control functions of the Automation system for a drilling vessel; to familiarize operators with all the functions of the system including the comprehensive diagnostic and fault-finding facilities; to improve the safety and reliability of drilling operations, through the increased knowledge and competence of key vessel personnel.

Prerequisites:
Staff attending should ideally be familiar with vessel operating procedures.

Participants:
Vessel engineering and electrical staff, electro-technical officers (ETOs), AVC/drilling operating staff.

Duration:
3 days
M406
Automation System Operation and Maintenance

Course Description:
Introduction to benefits and functions of the Power (PMS) and Vessel Management Systems (VMS).

Learning Outcomes:
Software screen representations, system hardware and network structure, and an understanding of the system operation onboard the vessel. Attendees will also participate in hands on simulation exercises encompassing power system faults and failures, shipboard controls, alarms and equipment monitoring.

Prerequisites:
Basic understanding of electrical systems, networking standards (ex. TCP/IP), NMEA sensor standards 0183 (Serial) and 2000 (Ethernet), Power Management Theory, switchboard logic

Participants:
Technicians, Vessel Assistant and Chief Engineers, Port Engineers, Maintenance Supervisors and Engine Cadets

Duration:
4 days
Operator Familiarization

M104

Automation Operator
Familiarization and Maintenance

Course Description:
This course covers the Automation systems in place on offshore vessels, with an emphasis on both the operational aspects and on diagnostics and fault-finding procedures, to suit the needs of operational, technical and maintenance staff.

“Automation” incorporates power management (PMS), vessel management (VMS/VCS), ballast and cargo control systems, etc.—as defined by the individual project scope.

Learning Outcomes:
To gain an insight into the operation and control functions of the Automation system for a specified vessel; to familiarize operators with all the functions of the system including the comprehensive diagnostic and fault-finding facilities; to aid staff in fault diagnosis and general maintenance of the system.

The primary aim of all courses is to improve the safety and reliability of DP operations through the increased knowledge and competence of key DP personnel.

Prerequisites:
General electrical background, basic computer skills. Staff attending should be familiar with vessel operational procedures.

Participants:
Vessel operating and maintenance staff of GE Power Conversion/Converteam’s AMC-based Integrated Automation System (IAS)/Automatic Vessel Control (AVC) systems; typically engineering and electrical staff, electro-technical officers (ETOs).

Duration:
2 days