Linking People and Technology
ABB Marine Academy
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Welcome to ABB Marine Academy

Training and competence management are one of the key success factors to our customers. ABB Marine service team has expertise in most vessel segments, such as cruise, LNG carriers, drillships, icebreakers and OSVs. Our areas of competence include commissioning, support, supply of spare parts, planned maintenance, retrofits and upgrades. This extensive competence pool enables us to understand and anticipate the needs of our customers and match these needs with tailored training.

In practice, this means we have improved our training portfolio. We offer more product and system courses, and better options for on-site training and coaching. We have also improved our training material to support trainees after the completion of their course. We make continuous improvements by collecting feedback after every course and consider those when developing the trainings. We hope you will recognize these improvements when using our services.

We look forward to hearing from you.

Yours sincerely

ABB Marine Academy team

ABB Marine Academy has set itself two targets: first, we want to provide our customers’ crew with the right kind of training that enables them to do their job safely and better; and second, we need to support our customers’ corporate management in reaching their safety and reliability KPIs, and their targets for cost and growth.
SAFETY
Quality training supports the crew towards safe operations, with ability to get the most of the equipment in all situations.

PERFORMANCE
Marine Academy training for ABB equipment allows the highest operational performance leading towards more efficient and sustainable operations.

QUALITY
Knowledge is power; with customized courses from Marine Academy your crew reaches most safe, efficient and sustainable operations.
Electrical Systems

H860 – Marine Power Plant Basics for Technical Staff
H873 – Marine Power Plant Advanced for Technical Staff
H862 – LNG Electrical Propulsion System
H872 – Low Voltage Drive System, Operation, Maintenance and Troubleshooting
H911 – ACS800LC Drilling Drive System
H913 – Drilling Drive System
H868 – HV Power Distribution System – General
H868T – MV Power Distribution System & LV Emax Maintenance
H869 – HV Power Distribution System – ZS1 Unigear
H870 – LV Power Distribution System
H860 – Marine Power Plant Basics for Technical Staff

Upon completion of this course the participants will have an understanding of a marine power plant’s design and function and an understanding of the ABB propulsion system.

Learning objectives:
Upon completion of this course the participant will be able to:
• communicate effectively with other technical staff
• identify the components of a marine power plant
• explain the limitations of a marine power plant
• troubleshoot fault conditions within a marine power plant
• critically assess the marine power plant in terms of efficiency and relevant actions

Contents:
• Marine power plant overview
• Regulation principles
• Frequency converters
• Motors & generators
• Basic electrical occupational safety and risk assessment
• Azipod® system overview (if required)

Methods:
• Lectures and demonstrations
• Workshop exercises on simulator console
• Visits to machine factory and Azipod® assembly factory if required

Duration: 3 days (+1 day for Azipod® if required)

Student profile:
Marine engineers and electro-technical personnel at the support and operational level.

Prerequisites:
None

Venue:
• Helsinki, Finland
• Genoa, Italy
• Rotterdam, Netherlands
• Singapore

Additional information:
Minimum 6, maximum 12 participants;
On-site training is available on request.
H873 – Marine Power Plant Advanced for Technical Staff

Upon completion of this course the participant will have a full understanding of a marine power plant’s design, function and maintenance main methods, measurement and testing procedures.

Course objectives:
Upon completion of this course the participant will be able to:
• Communicate effectively with other technical staff
• Identify the components of a marine power plant
• Troubleshoot fault conditions and test within a marine power plant
• Know safe working procedures for measurements and test
• Know all main tests for electrical marine equipment
• Know techniques for insulation assessment
• Know safety rules on marine HV environment according to current regulations and recommendations (IEC, STCW, SOLAS, UK HSE etc.)
• Know Marine HV safety aspects and safe working procedures
• Know dangers of electricity and arc-faults in switchgear
• Know the use of personal protective equipment (PPE)
• Know how using effectively and safely different type of test equipment.
• All modules knowledge will be tested with a daily exams whose score will contribute to the final participant evaluation (as requested by the customer)

Methods:
Highly interactive lectures with group work and case studies, as well as practical exercises with equipments and assessments.

Duration: 5 days

Student profile:
Marine engineers and electro-technical personnel at the support and operational level, with a good knowledge about electric science principles.

Prerequisites:
None

Venue:
• Genoa, Italy
• Rotterdam, Netherlands
• Houston, USA

Additional information:
Minimum 4, maximum 10 participants per course.
H862 – LNG Electrical Propulsion System

The goal of this course is to train the participants to operate and maintain a vessel propulsion control system by using the training simulator, based on vessel configuration.

Learning objectives:
Upon completion of this course, students will be able to understand the function of electrical propulsion control systems and operate the maintenance station.

Contents:
- General topics
  - Introduction to ABB Marine Services
  - Electrical propulsion system overview
- Operation
  - Navigate the maintenance station
  - Local and remote control
  - Operational modes and control modes
  - Protection functions
  - Blackout protection
  - Operational limitations
  - Start interlocks
- Software Introduction
  - Control system monitoring
  - System structure
- Fault-tracing and troubleshooting
  - Alarm and event handling

Methods:
This is an instructor-led course with interactive classroom discussions and associated lab exercises. Approximately 50% of the course is comprised of hands-on lab activities.

Duration: 4 days

Student profile:
Marine engineers and electro-technical personnel at the operational and management level.

Prerequisites:
The participant should have fundamental knowledge of vessel operation, and have basic knowledge of Windows OS. Completion of ACS6000 SD/AD marine drive course or similar knowledge is advisable.

Venue: Singapore

Additional information:
Minimum 4, maximum 6 participants;
On-site training is available on request.
H872 – Low Voltage Drive System, Operation, Maintenance and Troubleshooting

The course includes a first theoretical part on the basic concepts of VFD functionality and then devotes all the time to exercises with ACS800 and ACS880 with its development tools.

Learning objectives:
Upon completion of this course, the participants will have a deep understanding of VFD principles, clear steps to operate, maintain and troubleshoot issues.

Contents:
• Low Voltage Power Distribution Theory
• ACS800 and ACS880 system application program
• Control panel functions
• Control panel assistants
• Locating and identifying terminals
• Installation principles
• Basic Adaptive programming & DriveAP tool
• DriveWindow maintenance tool operations
• AC800M, CI858 and S800 I/O
• Fault tracing

Methods:
Classroom lectures and workshop session.

Duration: 5 days

Student profile:
Electrical Advanced operators, Engineers and Superintendents.

Prerequisites:
e-Learning available on request – highly suggested.

Venue:
• Genoa, Italy
• Rotterdam, Netherlands
• Other locations on request

Additional information:
Minimum 6, maximum 8 participants.
H911 – ACS800LC Drilling Drive System

The goal of this course is to learn how to start-up, operate, maintain and troubleshoot ABB ACS800/ACS800LC integrated drilling drives system for jack-ups, semi-submersibles and drillships.

Learning objectives:
Upon completion of this course, the participants will be able to locate hardware components, to verify and replace ACS800/ACS800LC supply, inverter and cooling units. The participants will also be able to perform basic troubleshooting of AC800M drilling drives control system. Project system backup/recovery and preventive maintenance are also discussed.

Main topics
• Construction of ACS800/ACS800LC
• System function of ABB drilling drives system
• Hardware operation
  - Removal and installation of DSU and INU
  - Filling of LCU and changing fans
  - Control panel operation
  - AC800M controller and communication
• Fault-tracing and troubleshooting
  - Explain alarm and fault message
  - Trace alarm and fault message
• Software
  - DriveWindow
  - Compact control builder

This description is also for:
H910K – ACS800 Drilling Drive System

Methods:
Classroom lectures; Practical lessons on training ACS800/ACS800LC and drilling simulator system.

Duration: 5 days

Student profile:
Marine engineers and electro-technical personnel at the operational and management level.

Prerequisites:
Basic knowledge of electronics, AC drive, drilling process and experience is advisable.

Venue:
• Singapore
• Houston, USA

Additional information:
Minimum 6, maximum 8 participants; On-site training on request.
H913 – Drilling Drive System

The goal of this course is to learn how to troubleshoot and maintain the ABB integrated drilling drives system. The tools and methods learned can be applied to the work in practice.

Learning objectives:
Upon completion of this course the participants will be able to explain the ABB drilling system project configuration and functions of different components. The participants will be able to trace alarms from the process panel down to drives and control components. System backup and recovery will also be discussed.

Contents:
- System functions of ABB drilling drives system
- Hardware operation
  - System structure
  - AC800M controller and drive connection
  - Process panel
- Fault-tracing and troubleshooting
  - Project I/O signal tracing
  - Perform DW/MP/TD start/stop
  - Communication failure
  - Create project backup
- Software
  - DriveWindow
  - Compact control builder
  - Panel builder

Methods:
Classroom lectures; Practical lessons on the training drilling simulator system and ACS800 demo units

Duration: 4 days

Student profile:
Marine engineers and electro-technical personnel at the operational and management level.

Prerequisites:
Drilling Drive System course from ABB or similar knowledge is advisable.

Venue:
- Singapore
- Houston, USA

Additional information:
Minimum 4, maximum 6 participants; On-site training on request.
H868 – HV Power Distribution System – General

The major objective of the course is to provide the participants with in-depth theory, and train them for safe operation, maintenance and testing of switchgears, breakers and relays.

Course objectives:
After completing the course successfully, the student will have a comprehensive background of the marine power plants and will be able to operate, maintain and work safely with circuit breakers (SF6, Vacuum, Emax), contactors and relays. Participants are given detailed theoretical coverage alongside practical exercises for better understanding of switchgears and Emax breakers.

Contents:
- Introduction to marine power plants
- Safety procedures working w/ switchboard
- Power distribution systems (transformers, generator and motors)
- Protection systems
- Voltage and frequency regulation
- Droop control
- Power management
- Switchboard
  - Components, accessories and inter locks
  - Installation activities
  - Assembly procedure
  - Maintenance and periodical checks

Methods:
The course will include practical demonstrations on various switchboard models, hands-on experience on device operation, and a visit to production facility.

Duration: 5 days

Student profile:
Marine engineers and electro-technical personnel at the operational and management level.

Prerequisites:
Marine Power Plant Basic for Technical Staff and Marine High Voltage Safety course from ABB Marine Academy or similar knowledge is advisable.

Venues:
- Genoa, Italy
- Rotterdam, Netherlands
- Houston, USA

Additional information:
Modified on-site training on request; Minimum 6, maximum 8 participants.
H868T – MV Power Distribution System & LV Emax Maintenance

Participants get in-depth theory and training for safe operation, maintenance and testing of switchgears, breakers and relays, and how to perform a regular maintenance program on Emax breakers.

Learning objectives:
After completing the course successfully, the student will have a comprehensive background of the marine power plants and will be able to operate, maintain and work safely with circuit breakers (SF6, Vacuum, Emax), contactors and relays. Participants are given detailed theoretical coverage alongside practical exercises for better understanding of switchgears and Emax breakers.

Contents:
• Switchboards
• Functional characteristics and performance of protection system
• Safe operation, maintenance and testing of switchgear (circuit breaker, contactor)
• Basic trouble shooting
• Power plant regulation principle
• Power distribution system overview (transformers, generators and motors)

Methods:
The course will include practical demonstrations on the switchboard, hands-on experience on Emax breakers and lecture concerning theory and principles.

Duration: 5 days

Student profile:
Marine engineers and electro-technical personnel at the operational and management level.

Prerequisites:
Marine Power Plant Basic for Technical Staff and Marine High Voltage Safety course from ABB Marine Academy or similar knowledge is advisable.

Venue: Genoa, Italy

Additional information:
Modified on-site training on request; Minimum 6, maximum 8 participants.
H869 – HV Power Distribution System – ZS1 Unigear

Training for safe operation, control, configuration, troubleshooting and maintenance of ABB Marine HV (>1 kV) air-insulated switchgear, circuit breakers and protective relays.

Learning objectives:
Upon completion of this course, students will be able to locate hardware components, to verify and replace switchgear apparatus and to perform preventive maintenance. Students get hands-on practical with Local HMI, Web HMI and PCM600, a programming and configuration tool with actual REF615 and REF630 relays.

Contents:
• Function description for ABB HV switchboards
• Hardware
  - Unigear ZS1
  - Circuit breakers HD4, VD4 & Vmax
  - Vacuum V contactor
  - Relion protective relays
• Operation
  - Operation and maintenance of Unigear ZS1
  - Practical on circuit breakers and contactors
• Relion relay practical hands-on
  - LHMI (front-panel user interface)
  - WHMI (web browser based user interface)
  - PCM600 (programming and configuration tool)
• Fault-tracing and troubleshooting
• Interpret alarms and fault messages
• Reset trip and block signal
• Trace digital input signals to protective relays

Methods:
Classroom lectures;
Demonstration and practical lessons on our training switchgear.

Duration: 4 days

Student profile:
Marine engineers and electro-technical personnel at operational and management level.

Prerequisites:
Marine Power Plant Basic for Technical staff in ABB propulsion and Marine High Voltage Safety or similar knowledge is advisable.

Venue:
• Beijing or Xiamen, China
• Helsinki, Finland
• Genoa, Italy
• Rotterdam, Netherlands
• Singapore
• Houston, USA

Additional information:
Minimum 6, maximum 8 participants;
On-site training is available on request.
H870 – LV Power Distribution System

The goal of this course is to train the participants in safe operation, control, configuration and maintenance of ABB LV switchgear MNS, air circuit breakers, molded-case circuit breakers and soft-starters.

Learning objectives:
Upon completion of this course, students will be able to locate hardware components, to understand and verify switchgear parts, breaker internal components and components inside cubicles. Students will also be able to perform maintenance, and identify low voltage electrical safety hazards.

Contents:
• General topics
  - Safety procedures while working on the switchboard
  - Introduction to ABB Marine Service
  - General marine power plant
  - Power plant regulation principles
• Hardware description
  - LV switchboard MNS compartments
  - Generators, motors and transformers
  - Air circuit breakers, protection releases and accessories
  - Molded-case circuit breakers, protection releases and accessories
  - Introduction to soft-starters
• Operation
  - Removal and installation of air circuit breaker
  - Manual charging of breaker spring and operation
  - Demonstration of use of protection relays
  - Racking of module drawers and identification of various positions of rotary handles on the modules

Methods:
Classroom lectures.
Demonstration and practical lessons on our training switchgears.

Duration: 2 days

Student profile:
Marine engineers and electro-technical personnel at the support, operational and management level.

Prerequisites and recommendations:
None

Venue: Houston, USA

Additional information:
Minimum 6, maximum 8 participants;
On-site training is available on request.
Electrical Products

H863 – ACS6000c NTY Cycloconverter
H864 – ACS6000 AD/SD Marine Drive
H874 – Marine HV Motors and Generators
H865 – SAMI Megastar Marine Drive
H866 – STADT x-AC-y-z Drive
H867 – PSR - Cycloconverter Marine Drive
H863 – ACS6000c NTY Cycloconverter

The participant will learn how to operate, maintain and troubleshoot the ACS6000c Cycloconverter system. The trainee will also learn how to use the available programming and troubleshooting tools with practical exercises.

Learning objectives:
Upon completion of this course the participants will be able to:
• Describe the drive system components.
• Explain the basic operation principle.
• Identify drive components and configure settings.
• Operate the drive.
• Carry out preventive maintenance.
• Perform basic troubleshooting tasks.
• Locate and replace faulty hardware components

Contents:
• Introduction to Variable Speed Drives
• System description
• Operation principle
• Control hardware
• Propulsion control system
• Water cooling system
• Operation of the drive (hands-on)
• Shaft encoder synchronization (hands-on)
• Phase test (hands-on)
• Thyristor replacement (hands-on)
• Software tool DriveWindow (hands-on).
• Preventive maintenance.
• Troubleshooting procedures.
• Life cycle information

Methods:
• Lectures (presentations) and demonstrations
• Perform tests and measurements on a fully equipped demonstration drive
• Visit of MV Drives assembly lines

Duration: 4 days

Student profile:
Marine engineers and electro-technical personnel at the operational and management level.

Prerequisites:
Marine Power Plant Basic for Technical Staff and Marine High Voltage Safety course from ABB Marine Academy or similar knowledge is advisable.

Venue: Turgi, Switzerland

Additional information:
Minimum 6, maximum 8 participants.
H864 – ACS6000 AD/SD Marine Drive

The goal of this course is to train the participants in the safe operation, control, configuration, troubleshooting and maintenance of an ACS 6000 drive.

Learning objectives:
Upon completion of this course, students will be able to understand the drive topology and understand the function of propulsion and drive control. They will be able locate the hardware components, verify and replace the drive's parts and perform preventive maintenance.

Contents:
- General topics
  - Introduction to ABB Marine Services
  - Safety procedures while working on the drive
  - Medium voltage safety requirements
  - In-depth theory of the ACS6000 drive principles
- Hardware description
  - Functions of components and PCBs
  - Hardware schematics and electrical drawings
  - Installation guidelines
- Water cooling system
  - Cooling circuit description
  - Preventive maintenance
- Operation
  - Energizing and de-energizing the converter
  - Start/stop sequence
- Software introduction
  - Inverter and excitation software concept
  - Data exchange between modules
  - Setting parameters using CDP and DriveWindow
- Fault-tracing and troubleshooting
  - Interpretation of alarm and fault messages
  - Replacement of PCBs and components
  - Getting help from ABB

Methods:
Classroom lectures with demonstrations using the training drive; Practical lessons on the training drive.

Duration: 4 days

Student profile:
Marine engineers and electro-technical personnel at the operational and management level.

Prerequisites:
Marine Power Plant Basic for Technical Staff in ABB propulsion and Marine High Voltage Safety course or similar knowledge is advisable.

Venue:
- Singapore
- Houston, USA
- Turgi, Switzerland

Additional information
Minimum 6, maximum 8 participants; On-site training is available on request.
H874 – Marine HV Motors and Generators

The goal of this course is to learn the concepts, theory, operation, maintenance, troubleshooting and product description and construction of AMI and AMZ motors and AMG generators.

Learning objectives:
Upon completion of this course the participants would have learnt:
• Concepts, theory, operation and maintenance of motors and generators.
• Features, constructional details, operation and maintenance of the following ABB products
• Basic troubleshooting knowledge
• To perform independent maintenance

Contents:
Concepts and Theory (refresher):
• Basic Theory
• AC Theory and Motors
• DC Theory and Motors
• Standards/Applications:
  - Duty Type
  - Ingress protection
  - International cooling
  - Mounting
Products - AMI and AMZ motors and AMG generator:
• Product description
• Basic Ratings and specifications
• Constructions features and details
• Operation
• Troubleshooting and Maintenance:
• Basics of troubleshooting

Methods:
Classroom lecture,
Hands on skill.

Duration: 3 days

Student profile:
Marine engineers and electro-technical personnel at the support and operational level. Shoreside technical personnel at operational level.

Prerequisites:
Participants should know the fundamentals of working with motors and generators.

Venue:
• Genoa, Italy
• Singapore

Additional information:
Maximum 8 participants;
On-site training on request.
H865 – SAMI Megastar Marine Drive

The goal of this course is to teach students to operate, maintain and trouble-shoot Megastar W in marine applications. Students will learn how the Megastar is connected to the vessel automation system.

Learning objectives:
The goal of this course is to teach students to operate, maintain and trouble-shoot Megastar W in marine applications. Students will learn how the Megastar is connected to the vessel automation system. The training covers the following types and constructions:
• SAMI Megastar W – single/parallel drive
• Drives with APC-controller

Contents:
• Safety procedures while working on the drive
• Hardware and software overview
• Component and board functions
• Reading and interpreting circuit diagrams and part lists
• Control panel functions
• Preventive maintenance
• Fault tracing
• Replacing HV – components
• Using the PC-tools for the Megastar

Methods:
Workshop with presentations and demonstrations held in classroom; Perform tests and measurements on a fully equipped demonstration drive.

Duration: 4 days

Student profile:
Marine engineers and electro-technical personnel at the operational and management level.

Prerequisites:
Marine Power Plant Basic for Technical Staff and Marine High Voltage Safety course from ABB Marine Academy or similar knowledge is advisable.

Venue: Vaasa, Finland

Additional information:
Minimum 6, maximum 8 participants.
H866 – STADT x-AC-y-z Drive

The goal of this course is to train the participants in the safe operation, control, configuration, troubleshooting and maintenance of a STADT x-AC-y-z Drive.

Learning objectives:
Upon completion of this course, students will be able to locate the hardware components, to verify and replace the drive’s parts and to perform preventive maintenance. DriveWindow is used as a programming and troubleshooting tool and is learned by practical exercises on our training drive.

Contents:
• General topics
  - Introduction to ABB Marine Services
  - Safety while working on the drive
  - In-depth theory of the Stadt x-AC-y-z Drive principles
• Hardware description (power electronics and control)
  - Functions of components and PCB’s (printed circuit boards)
  - Hardware schematics and electrical drawings
  - Installation guidelines
• Water cooling system
  - Cooling circuit description
  - Direct IGBT water cooling principle
  - Importance of cooling water mixture
• Operation
  - Charging and discharging of the converter
  - Start/stop sequence using local

Methods:
Lectures with demonstration on our training drive; Practical exercises with the training drive.

Duration: 4 days

Student profile:
Marine engineers and electro-technical personnel at the support and operational level.

Prerequisites:
Marine Power Plant Basic for Technical Staff in ABB propulsion or similar knowledge is advisable.

Venue:
• Ulsteinvik, Norway
• Singapore

Additional information:
Minimum 4, Maximum 6 participants; On-site training on request.
H867 – PSR - Cycloconverter Marine Drive

The participants will learn how to operate, maintain and troubleshoot the PSR Cycloconverter system. Also the participants will learn the functions between the propulsion control and the drive control units.

The course will cover how to use the available programming and troubleshooting tools, and will train the participants in operation and troubleshooting, with practical exercises.

**Learning objectives:**
Students will be able to understand the drive topology and operation. Students will be able to locate the hardware components, test, measure, troubleshoot and replace the drive’s parts when needed. They will understand the function of propulsion and drive control.

**Contents:**
- Overview of cycloconverter operation principle
- Control and power system hardware
- High speed circuit breakers (operation and maintenance)
- Excitation system (brush/brushless)
- Operation and different drive modes
- Propulsion control software
- Cooling principles
- Software tools
- Hands-on training
- Preventive maintenance, troubleshooting and repair

**Methods:**
Workshop with presentations and demonstrations held in the classroom; Perform tests and measurements on an ACS6000c and PSR demonstration unit; Visit to ABB MV drive factory assembly lines.

**Duration:** 4 days

**Student profile:**
Marine engineers and electro-technical personnel at the operational and management level.

**Prerequisites:**
Marine Power Plant Basic for Technical Staff and Marine High Voltage Safety course from ABB Marine Academy or similar knowledge is advisable.

**Venue:**
- Turgi, Switzerland
- Customer defined location

**Additional information:**
Minimum 6, maximum 8 participants.
Mechanical Products

H914 – Turbocharging Senior for Technical Staff
H915 – VTR Advanced
H914 – Turbocharging Senior for Technical Staff

This training is targeted to end user who operate TPL platform turbochargers. Course develops items like: basic maintenance as well as cartridge concept. Included a workshop session with operational exercises.

Learning objectives:
Upon completion of this course, the participants will have an understanding of turbocharging basics and TPL installation on four stroke diesel marine applications, with reference to operation and first level maintenance. Understanding of turbocharging basics on four stroke diesel marine applications, with reference to interaction between engine and turbocharger, design criteria and operational influencing parameters will be provided.

Contents:
• Turbocharging principles
• TPL- A/C service concept
• TPL- A/C Monitoring in operation
• TPL- A/C Cleaning in operation
• Turbocharger cartridge concepts
• TPL- A/C Disassembly and assembly (workshop session)
• Main dimensions and measurements, tightening torques
• Interaction between engine and turbocharger
• Influence of ambient conditions on turbocharger
• Surging
• HFO operation
• Loads on turbocharger components
• Rating plate and design criteria (SIKO)

Methods:
Classroom lectures and workshop session.

Duration: 4 days

Student profile:
Marine Engineers and Superintendents.

Prerequisites:
None

Venue: Genoa, Italy

Additional information:
Minimum 6, maximum 8 participants; PPE (Safety Shoes) are required to enter the workshop.
H915 – VTR Advanced
– Antifriction Bearing Turbochargers, Turbocharging Senior for Technical Staff

This training is targeted to end user who operate VTR platform turbochargers. Course develops items like: basic maintenance as well as cartridge concept. Included a workshop session with operational exercises.

Learning objectives:
Upon completion of this course, the participants will have an understanding of turbocharging basics and VTR installation on four stroke diesel marine applications, with reference to operation and on board maintenance. Understanding of turbocharging basics on four stroke diesel marine applications, with reference to interaction between engine and turbocharger, design criteria and operational influencing parameters will be provided.

Contents:
• Turbocharging principles
• VTR Service concept
• VTR Monitoring in operation
• VTR Cleaning in operation
• VTR Disassembly and assembly (workshop session)
• Main dimensions and measurements, tightening torques
• Interaction between engine and turbocharger
• Influence of ambient conditions on turbocharger
• Surging
• HFO operation
• Rating plate and design criteria (SIKO)

Methods:
Classroom lectures and workshop session.

Duration: 4 days

Student profile:
Marine Engineers and Superintendents.

Prerequisites and recommendations:
None

Venue: Genoa, Italy

Additional information:
Minimum 6, maximum 8 participants.
Azipod® Propulsion

H880 – Azipod® CO Technical Training
H880 – Azipod® DO Technical Training
H881 – Azipod® VO Technical Training H882 – Azipod® XO Technical Training
H883 – Azipod® Vessel Operation Operational Level
H884 – Azipod® Vessel Operation, Onboard Coaching
H885 – Azipod® Vessel Operation, Management Level
H931 – Azipod® VI Technical Training (for ice vessels)
H938 – Azipod® Vessel Operation in ice, Management Level
H880 – Azipod® CO Technical Training

This course provides a deeper understanding of the Azipod® propulsion systems, and how to operate, maintain and troubleshoot the system components.

**Learning objectives:**
Upon completion of this course the participants will have advanced knowledge of Azipod® CO system, understand the functioning of propulsion and drive control, operate and maintain ACS800 Azipod CO drive systems, and trace and correct basic faults.

**Contents:**
- Azipod CO propulsion system structure
- Drive control and electrical steering gear
- Construction and function of ACS800 single drive and ACS800LC drive
- Fault tracing methods, exchanging the parts and modules
- Theory and exercises on the drive and controller PC tool programs
- Factory visit

**Methods:**
Lectures and demonstrations; Workshop exercises with demo equipment; Manual exercises; general, propulsion, maintenance.

**Duration:** 5 days

**Student profile:**
Marine engineers and electro-technical personnel at the operational and management level.

**Prerequisites:**
Participants should have attended the Marine Power Plant Basic for Technical Staff from ABB Marine Academy.

**Venue:** Helsinki, Finland

**Additional information:**
Minimum 6 participants and maximum 8 participants.
H880 – Azipod® DO Technical Training

This course provides a deeper understanding of the Azipod® propulsion systems, and how to operate, maintain and troubleshoot the system components.

Learning objectives:
Upon completion of this course the participants will have advanced knowledge of Azipod® DO system, understand the functioning of propulsion and drive control, operate and maintain ACS880 Azipod DO drive systems, and trace and correct basic faults.

Contents:
• Azipod DO propulsion system structure
• Drive control and electrical steering gear
• Construction and function of ACS800 single drive and ACS800LC drive
• Fault tracing methods, exchanging the parts and modules
• Theory and exercises on the drive and controller PC tool programs
• Factory visit

Methods:
Lectures and demonstrations; Workshop exercises with demo equipment; Manual exercises; general, propulsion, maintenance.

Duration: 5 days

Student profile:
Marine engineers and electro-technical personnel at the operational and management level.

Prerequisites and recommendations:
Participants should have attended the Marine Power Plant Basic for Technical Staff from ABB Marine Academy.

Venue: Helsinki, Finland

Additional information:
Minimum 6 participants and maximum 8 participants.
H881 – Azipod® VO Technical Training

This course provides a deeper understanding of the Azipod® propulsion systems, and how to operate, maintain and troubleshoot the system components.

**Learning objectives:**
Upon completion of this course the participant will be able to:
- describe the functions of the different Azipod VO sub-systems and how they interact
- understand the importance of correct maintenance
- understand the monitoring possibilities and how to troubleshoot the discussed systems
- perform adjustments on critical system components

**Contents:**
- Safety procedures while working on the Azipod
- Terminology and evolution of Azipod propulsion
- Basics of Azipod hydrodynamics
- Sub-systems, maintenance and conditioning-monitoring
- Power, liquid and data transmission system
- Encoder signal fault tracing
- Hydraulic steering gear
- Hydraulic pump settings and monitoring (inner-control loop)
- The ASU360 servo unit settings
- Steering angle feedback assembly and adjustment (outer control loop)
- Remote control vs. local control
- Review of Azipod unit space safety
- Factory visit

**Methods:**
- Lectures and demonstrations;
- Workshop exercises with demo equipment;
- Manual exercises; general, propulsion, maintenance.

**Duration:** 5 days

**Student profile:**
Marine engineers and electro-technical personnel at the operational and management level.

**Prerequisites:**
Marine Power Plant Basic for Technical Staff and Azipod® Space Safety course from ABB Marine Academy are advisable.

**Venue:** Helsinki, Finland

**Additional information:**
Minimum 6, maximum eight participants;
On-site training on request.
H882 – Azipod® XO Technical Training

This course provides a deeper understanding of Azipod XO propulsion system, and how to operate, maintain and troubleshoot the system components.

**Learning objectives:**
Participants will be able to describe the functions of the different sub-systems of the Azipod propulsion system and how they interact. They will understand the importance of correct maintenance, be able to describe the monitoring possibilities and how to troubleshooting systems and perform adjustments on specific system components.

**Contents:**
- Safety procedures while working on the Azipod
- Terminology and evolution of Azipod propulsion
- ACS800 steering gear drive programming, adjustment and troubleshooting
- Electric steering gear
- Slip-ring unit technology and maintenance
- Power and data transmission system
- Electric steering gear
- Steering angle feedback assembly
- Review of safety aspects inside the Azipod unit

**Methods:**
Classroom lessons and discussions about Azipod XO systems; Lectures and demonstrations; Workshop exercises with demonstration equipment; Visits to machine factory and Azipod assembly factory.

**Duration:** 5 days

**Student profile:**
Marine engineers and electro-technical personnel at the operational and management level.

**Prerequisites:**
Marine Power Plant Basic for Technical Staff and Azipod® Space Safety course from ABB Marine Academy are advisable.

**Venue:** Helsinki, Finland

**Additional information:**
Minimum 6, maximum 8 participants; On-site training is available on request.
H883 – Azipod® Vessel Operation
Operational Level

This course prepares deck officers for safe watch keeping and bridge communication on twin-Azipod vessels in normal and special operational conditions.

Learning objectives:
Upon completion of this training, the participants will know the operational principles of diesel-electric (DE) Azipod propulsion systems. They will understand the flexibility of the system and will be able to identify potential malfunctions and to cope with them without sacrificing vessel safety. They will be able to communicate about the different aspects of the propulsion system in a clear and concise manner.

Contents:
• Azipod vessel operation with emphasis on pilot voyage and harbor maneuvers
• Azipod vessel system functionalities and power plant behavior in different conditions
• Effects of power plant and propulsion system malfunctions

Methods
Hands-on exercises on a full mission bridge simulator; Practical lessons and discussions on diesel electric Azipod propulsion.

Duration: 3 days

Student profile:
Azipod® vessel deck personnel at operational level.

Prerequisites:
Experience of watch keeping on modern, preferably Azipod vessels, and of bridge simulator training.

Venue:
• Aboa Mare Training Centre Turku, Finland
• ABB Marine Training Centre Helsinki, Finland
• Marine Training Center Hamburg GmbH, Germany

Additional information:
Maximum 6 participants in Turku and Hamburg; Maximum 4 participants in Helsinki.

This workshop is run in conjunction with an approved maritime simulation center.
H884 – Azipod® Vessel Operation, Onboard Coaching

Onboard workshop for management and operational level (STCW) deck and engine personnel on twin-Azipod cruise vessel operation in normal and special operational conditions.

Learning objectives:
The training course gives the participants an introduction, or refresher, on the operational principles of diesel-electric Azipod vessels taking into account vessel safety, passenger comfort, environmental and economical requirements and operation efficiency including maintenance needs.

Contents:
• Diesel-electric propulsion system behavior in various situations
• System functionalities, power plant and potential malfunctions
• Vessel resource management and communication

Methods:
Practical presentations and discussions in a training room. Hands-on exercises utilizing ship’s bridge equipment.

Duration: 1 or 2 days

Student profile:
Azipod® vessel deck personnel and marine engineers at management level.

Prerequisites:
Not applicable. This training may be used as a refresher for persons who have participated in Azipod Vessel Operation, Operational or Management Level training in bridge simulator.

Venue: Onboard.
H885 – Azipod® Vessel Operation, Management Level

Management level (STCW) workshop on twin-Azipod cruise vessel operation and handling covering normal operation, malfunctions and bridge communication.

Learning objectives:
Upon completion of this training, the participants will have deep understanding of the operational principles of Azipod vessels. They will be able to fully utilize the flexibility of the propulsion system and to cope with them without sacrificing vessel safety. Bridge communication about the different aspects of vessel operation and handling in a clear and concise manner is emphasized. This workshop is run in conjunction with maritime simulation center.

Methods:
Training consists of discussions, lessons and full mission bridge simulator exercises to ensure learning at top level. On request, ABB Marine factory experts are at the disposal of the participants to answer questions at all levels.

Duration: 5 days

Student profile:
Azipod® vessel deck personnel at management level.

Prerequisites:
Several years experience of Azipod vessel operations.

Venue:
- MTC Marine Training Center Hamburg GmbH, Germany
- Aboa Mare Training Centre Turku, Finland

Additional information:
Maximum 6 participants.

This workshop is run in conjunction with an approved maritime simulation center.
H931 – Azipod® VI Technical Training (for ice vessels)

This course provides a deeper understanding of the Azipod® propulsion systems, and how to operate, maintain and troubleshoot the system components.

Learning objectives:
Upon completion of this course the participant will be able to:
• describe the functions of the different Azipod VI* sub-systems and how they interact
• understand the importance of correct maintenance
• understand the monitoring possibilities and how to troubleshoot the discussed systems
• perform adjustments on critical system components e.g. hydraulic steering gear pump, EMRI servo unit (ASU36X)

Contents:
• Safety procedures while working on the Azipod
• Terminology and evolution of Azipod propulsion
• Basics of Azipod hydrodynamics
• Sub-systems, maintenance and conditioning monitoring
• Power, liquid and data transmission system
• Hydraulic steering gear
• Hydraulic pump settings and monitoring (inner-control loop)
• The ASU360 servo unit settings
• Steering angle feedback assembly and adjustment (outer control loop)
• Remote control vs. local control
• Review of Azipod unit space safety adjustment (outer control loop)
• Factory visit

Methods:
Lectures and demonstrations;
Workshop exercises with demo equipment;
Visit to machine factory.

Duration: 5 days

Student profile:
Marine engineers and electro-technical personnel at the operational and management level.

Prerequisites:
Marine Power Plant Basic for Technical Staff and Azipod® Space Safety course from ABB Marine Academy are advisable.

Venue: Helsinki, Finland

Additional information:
Minimum 6, maximum eight participants;
On-site training on request.
H938 – Azipod® Vessel Operation in ice, Management Level

Management level workshop on Azipod vessel operation in multiple ice conditions and bridge communication. This course includes partly theory and simulator exercises required in Polar Code certificate.

Learning objectives:
Upon completion of this training, the participants will have deep understanding of the operational principles of Azipod vessels, taking into account vessel safety, environmental and economical requirements and operational efficiency and maintenance needs. They will be able to fully utilize the flexibility of the propulsion system and to cope with them without sacrificing vessel safety. Bridge communication about the different aspects of vessel operation and handling in a clear and concise manner is emphasized.

Methods:
Training consists of discussions, lessons, bridge simulator exercises and debriefings to ensure learning at top level.

Duration: 5 days

Student profile:
Azipod® Vessel Operation in Ice, Management level.

Prerequisites:
Azipod vessel deck personnel at management level. H883 – Azipod® vessel operation, operational level or good experience of Azipod vessel operations.

Venue
• Helsinki, Finland
• Turku, Finland (Aboa Mare Training Centre)

Additional Information:
Maximum 6 participants in Turku
Maximum 4 participants in Helsinki
Automation

H894 – Marine 800xA and AC800M Automation Training
H895 – Marine 800xA and AC400 Automation Training
H899/H898 – DEGO II and III Electronic Governor Systems
H900 – Power Management System – Electro Technical Course
H894 – Marine 800xA and AC800M Automation Training
System Diagnostic and Troubleshooting

The goal of this course is to learn how to perform regular maintenance and troubleshooting on the system and how the 800xA IAMCS (Integrated Alarm, Monitoring and Control System) is designed to fit marine applications and requirements.

Learning objectives:
After this course, students will be able to understand the philosophy of an up-to-date automation system, fully use all operator functionalities in order to maximize productivity, troubleshoot common issues reducing decision time, perform engineering activities for run-time operations, and optimize the process.

Contents:
• 800xA IAMCS philosophy, products overview and life-cycle.
• IT architectures on ferry and cruise applications - TCP/IP
  - Routers, switches, firewalls
  - Relationship between networks onboard
• Microsoft-based IT devices
  - Clients and servers
  - MS Windows 7/10, MS Windows ’08/10
    - In-dustrial IT with OPC protocol
  - 800xA configuration and startup
• AC800M programming
  - Base concepts of CPU w/ program languages

Methods:
Workshop held in classroom;
Building of a demo application starting from a void system; Fault tracing by identifying issues from abnormalities.

Duration: 5 days

Student profile:
Marine engineers and electro-technical personnel at the support and operational level.

Prerequisites:
Students should know the fundamentals of working with automation control system. Marine 800xA automation training for operators – Operation and diagnostic is advisable.

Venue:
• Genoa, Italy
• Rotterdam, Netherlands
• Singapore

Additional information:
Minimum 6, maximum 8 participants.
H895 – Marine 800xA and AC400 Automation Training
System Diagnostic and Troubleshooting

The goal of this course is to learn how to perform regular maintenance and troubleshooting upon the system, and how the 800xA IAMCS (Integrated Alarm, Monitoring and Control System) is designed to fit marine applications and requirements.

Learning objectives:
After this course, students will be able to understand the philosophy of an up-to-date automation system. They will be able to use all operator functionalities fully in order to maximize productivity, troubleshoot common issues to reduce decision time, perform engineering activities for runtime operations and optimize the process.

Contents:
• 800xA IAMCS philosophy, products overview and life-cycle.
• IT architectures on ferry and cruise applications - TCP/IP
  - Routers, switches, firewalls
  - Relationship between networks onboard
• Microsoft-based IT devices
  - Clients and servers
  - MS Windows 7/10, MS Windows '08/10
  - Industrial IT with OPC protocol
• AC800M PLC programming
  - Base concepts of CPU w/ program languages

Methods:
Workshop held in a classroom;
Build demonstration application starting from a void system; Hands-on exercises on 800xA system; Fault tracing by identifying issues from abnormalities.

Duration: 5 days

Student profile:
Marine engineers and electro-technical personnel at the support and operational level.

Prerequisites:
Students should know the fundamentals of working with automation control systems. Marine 800xA automation training for operators - operation and diagnostic is advisable.

Venue:
• Genoa, Italy
• Rotterdam, Netherlands

Additional information:
Minimum 6, maximum 8 participants.
H899/H898 – DEGO II and III Electronic Governor Systems

The goal of this course is to train the participants in safe operation, troubleshooting, tuning and basic repairs of DEGO II and III electronic governor systems and ASAC actuators.

Course objectives:
Upon completion of this course, students will be able to understand and identify abnormal behaviour of the DEGO systems, locate faults in the different units, repair by replacement, perform calibrations and make fine tunings. They will also be able to perform basic maintenance and repairs on ASAC actuators.

Contents:
• Basic theory of electronic governors
• Generator application
• ASAC actuators
• ABB DEGO II and III governor concept
• Trouble shooting techniques and repair
• Practical exercises

Methods:
Lectures with demonstration on our simulator systems, practical exercises on our simulator systems, practical exercises in operating the PC based tool DEGO III Aid.

Duration:
H899 DEGO II and III combined 5 days H897 DEGO II 2 or 3 days*
H898 DEGO III 2 or 3 days*
*Depending on application

Student profile:
Marine engineers and electro-technical personnel at operational and management level.

Prerequisites:
Marine power plant basic for technical staff in ABB propulsion is advisable. Basic electrical knowledge is required.

Venue: Rotterdam, Netherlands

Additional information:
Minimum 4, maximum 6 participants Propulsion application on request.
H900 – Power Management System – Electro Technical Course

The course starts from the Electrotechnical aspects of a marine AC power plant equipment to get to the operations of the ABB 800xA control system using with ABB AC800M.

Learning objectives:
After completing the course successfully, the student will have a comprehensive background of the Marine Power Management, including engineering, dimensioning, troubleshooting and fault tracing. On request, a deep insight session on several ABB products is available.

Contents:
• Onboard Power Management
• Generators control concept
• PID controller
• Generators Parallel concepts and Synchronization Droop control mode
• Reverse Power & Loss Excitation concepts
• Harmonic Distortions and power distribution disturbances
• Waveforms analysis
• Fault tracing
• Restore After Blackout understanding

Methods:
Workshop held in a classroom;
Theory and exercises on PMS demo application;
Fault tracing by identifying issues from abnormalities.

Duration: 2 days

Student profile:
Marine engineers and electro-technical personnel at operational and management level.

Prerequisites:
Marine Power Plant Basic for Technical Staff in ABB propulsion and Marine High Voltage Safety or similar knowledge is advisable.

Venue: Genoa, Italy

Additional information:
Minimum 6, maximum 8 participants.
Safety and STCW

H852 – HV Safety Management STCW, MCA/NMA/ILT Approved
H853 – HV Safety STCW - US Coast Guard Approved
H855 – High Voltage Technology, Operational Level
H854 – High Voltage Technology, Management Level
H850 – Azipod® Space Safety
H852 – HV Safety Management
STCW, MCA/NMA/ILT Approved

This course has been designed to satisfy the HV requirements laid out in the Standards of Training, Certification and Watchkeeping (STCW), Manila Amendments, and is approved by the UK’s Maritime & Coastguard Agency as satisfying the requirements laid out in MIN 494 (M), Norwegian Maritime Authority (Sjøfartsdirektoratet) and Netherlands Authority (ILT).

Learning objectives:
Upon completion of this course, the trainees will be able to manage a high voltage installation, trouble shoot and restore marine HV systems to an operating condition. This will mean that the trainee meets the requirements laid down in the Knowledge, Understanding and Proficiencies for High Voltage installations set out in Tables A-III/2 (part) of the STCW Convention and Code 1978, as amended.

Main topics
- Safety rules on marine HV environment according to current regulations and recommendations (STCW, SOLAS, UK HSE etc.)
- Marine HV safety aspects and safe working procedures
- Special considerations for offshore electrical installations
- Dangers of electricity and arc-faults in switch-gears
- Personal protective equipment
- Marine Electrical, Propulsion and Distribution Systems
- Protection system of electrical installations
- Accident analysis workshop
- Practical exercises

Methods:
Highly interactive lectures with group work and case studies, as well as practical exercises and assessments.

Duration: 5 days

Student profile:
Engine personnel at the operational & management levels, and all electro-technical personnel who are dealing with high voltage equipment and systems.

Prerequisites:
Prior to the course, trainees must satisfy one of the following conditions:
- Prior electrical or electro-technical experience in a ship- board environment; or,
- Have completed 12 months sea time as EOOW; or,
- Part of an initial electro-technical training program

Venue:
- Genova, Italy
- Rotterdam, Netherlands
- Singapore - MCA approved

Additional information:
Maximum 10 participants per course.
H853 – HV Safety STCW
US Coast Guard Approved

This course satisfies the HV requirements laid out in the Standards of Training, Certification and Watchkeeping (STCW), Manila Amendments, and is approved by the United States Coast Guard.

Learning objectives:
Upon completion of this course, the trainees will be able to manage a high voltage installation, trouble shoot and restore marine HV systems to an operating condition. This will mean that the trainee meets the requirements laid down in the Knowledge, Understanding and Proficiencies for High Voltage installations set out in Tables A-III/2 (part) of the STCW Convention and Code 1978, as amended.

Contents:
• Safety rules on marine HV environment according to current regulations and recommendations (STCW, SOLAS, HSE etc.)
• Marine HV safety aspects and safe working procedures
• Special considerations for offshore electrical installations
• Dangers of electricity and arc-faults in switchgears
• Personal protective equipment
• Marine Electrical, Propulsion and Distribution Systems
• Protection system of electrical installations
• Accident analysis workshop
• Practical exercises

Duration: 5 days

Student profile:
Engine personnel at the operational & management levels, and all electro-technical personnel who are dealing with high voltage equipment and systems.

Prerequisites:
Previous electrical degree or certification is not required; however, a basic level of electrical knowledge is advised.

Venue: Houston, USA

Additional information:
Maximum 10 participants per course.
H855 – High Voltage Technology, Operational Level

This course has been designed to satisfy the HV requirements laid out in the Standards of Training, Certification and Watchkeeping (STCW), Manila Amendments, and it is approved by the Italian Minister of Transportation, decree 15th February 2016 (16A01447).

Learning objectives:
Upon completion of this course, the trainees will be able to identify high voltage devices, understand dangerous situations and set up safety procedures for safe working. This will mean that the trainee meets the requirements laid down in the Knowledge, Understanding and Proficiencies for High Voltage installations set out in Tables A-III/1 of the STCW Convention and Code 1978, as amended.

Contents:
• Theory on High Voltage devices location
• Dangers on High Voltage
• Personal Protection Equipment
• Procedures of safe working on High Voltage installations
• Laws: Rules and guidelines
• Earthing system

Methods:
Educational lesson.

Duration: 5 hours

Student profile:
Engine personnel at the operational & management levels and all electro-technical personnel who are dealing with high voltage equipment and systems.

Prerequisites:
Prior to the course, trainees must satisfy following conditions:
• Have completed 6 months sea time as EOOW and during onboard training activities
• Own a valid Basic Training certificate
• Own an Italian Seamen Book

Venue:
• Genova (Italy), c/o ABB Marine Academy - University of Naval Architecture, DITEN Department
• Torre del Greco (Italy), c/o ACMA Enterprise, ABB Marine Academy Department

Language:
• Italian
• English

Additional information:
Maximum 20 participants per course.
This course has been designed to satisfy the HV requirements laid out in the Standards of Training, Certification and Watchkeeping (STCW), Manila Amendments, and it is approved by the Italian Minister of Transportation, decree 15th February 2016 (16A01447).

**Learning objectives:**
Upon completion of this course, the trainees will be able to manage a high voltage installation, troubleshoot and restore marine HV systems to an operating condition. This will mean that the trainee meets the requirements laid down in the Knowledge, Understanding and Proficiencies for High Voltage Installations set out in Tables A-III/2 (part) of the STCW Convention and Code 1978, as amended.

**Contents:**
- Safety rules on marine HV environment according to current regulations and recommendations (STCW, SOLAS, IT HSE etc.)
- Marine HV safety aspects and safe working procedures
- Special considerations for offshore electrical installations
- Dangers of electricity and arc-faults in switchgears
- Personal protective equipment
- Marine Electrical, Propulsion and Distribution Systems
- Protection system of electrical installations
- Accident analysis workshop
- Practical exercises

**Methods:**
Highly interactive lectures with group work and case studies, as well as practical exercises and assessments.

**Duration:** 5 days

**Student profile:**
Engine personnel at the operational & management levels and all electro-technical personnel who are dealing with high voltage equipment and systems.

**Prerequisites:**
At least 5 days prior to the course, trainees must satisfy following conditions:
- High Voltage Technology, Operational Level certification (ABB H855 or equivalent)
- Basic Training certification
- Italian Seamen Book
- At least 6 months onboard in training activities
- CoC expiring (if available)
- If embarked, copy of the document proving his/her license, signed by the Coastguard, issued for course attendance

**Venue:**
- Genova (Italy), c/o ABB Marine Academy
- University of Naval Architecture, DITEN Department
- Torre del Greco (Italy), c/o ACMA Enterprise, ABB Marine Academy Department

**Additional information:**
Maximum 10 participants per session c/o ABB Marine Academy and ACMA Enterprise.
Maximum 20 participants per session c/o University.
H850 – Azipod® Space Safety

Participants will understand the possible risks and hazards when working in and around the Azipod unit space, as well as learn dealing the risks and improving their readiness in the case of an emergency.

Learning objectives:
Upon completion of this course the participants will be able to:
• identify the different hazards risks and the possible consequences when working inside the Azipod unit’s space
• enter and work safely inside the Azipod unit space
• understand the duties of confined space personnel (Entrant, Attendant, Supervisor and Rescuer)
• attend an Entrant during normal entry
• assist during an emergency

Contents:
General topics
• Electrical Safety concerning Azipod Entry
• Azipod propulsion as an engineering system
• Occupational risks with Azipod propulsion
• Confined space regulation
• Duties of involved personnel
• Typical Azipod unit entries and entry procedures
• Traumatology (First Aid in a confined space)
• Rescue operations
• Use of protective equipment required for safe entry (different PPE, fall protection etc.)
• Entry to the Azipod space-simulator
• Evacuating an injured person from the Azipod space -simulator
• Rescue action plan for the Azipod space -simulator

Methods:
Lectures, group discussions and group work; Exercises in simulated space.

Duration: 4 days

Student profile:
All deck, engine and electro-technical personnel responsible for Azipod® entry operations and those personnel who conduct Azipod space maintenance.

Prerequisites: Satisfactory health condition to be able to work inside a confined space.

Venue: Helsinki, Finland

Additional information:
Minimum 6, maximum 8 participants.
Digital and advisory systems

H830 – Marine Cyber Security Awareness - Basic Level
H831 – Marine Cyber Security Awareness - Advanced Level
H921 – ABB Ability™ Marine Software - OCTOPUS OFFICE
H922 – ABB Ability™ Marine Software - OCTOPUS Onboard Basic
H923 – ABB Ability™ Marine Software - OCTOPUS Onboard Commissioning
ABB Ability™ Marine Pilot Control & Pilot Vision
H830 – Marine Cyber Security Awareness - Basic Level

The course has been designed to provide participants with basic knowledge of Cyber Security and IT threats in Marine application, in accordance with IEC 62443.

In this course IT infrastructures - ensuring life support, productivity and Owners’ specific KPIs - are turning into high complexity systems, where the Awareness and Knowledge of each single crew-member is crucial against Cyber threats and planned attacks.

Learning objectives:
Upon completion of this course, the participants will be aware about IT technologies basics, threats, risks and vulnerabilities and the crucial role of the engineer at the Operational Level, who has to prevent infections and IT hacks.

Contents:
• Threats, Risks and Vulnerabilities
• Technology Mitigation
• Your Role in Cyber Security

Methods:
Interactive Classroom lectures; Webinars.

Duration: 1 day

Student profile:
IT software engineers, service engineers, vessel engine operators, vessel deck operators, superintendents.

Prerequisites:
None

Venue:
• All Marine Academy locations
• Customers’ premises

Additional information:
Minimum 6, maximum 8 participants.
H831 – Marine Cyber Security Awareness - Advanced Level

The course has been designed to provide participants with advanced knowledge of Cyber Security and IT threats in Marine application, in accordance with IEC 62443.

In this course the awareness step must be completed by an exhaustive course about strategies and solutions to fully understand cryptography and IT devices involved, in order to harden and increase safety for IT based systems.

Learning objectives:
Upon completion of this course, participants will be trained on advanced knowledge about technology mitigations for Cyber Security, focusing on basics of cryptography showing how it is used, in order to secure communications and how communication protocols are fundamental to secure the exchange of information.

Contents:
• Advanced Networking
• Cryptography
• Reactions to threats
• Marine Protocols

Methods:
Interactive Classroom lectures and workshops.

Level: Advanced (Management Level)
Duration: 2,5 days

Student profile:
IT software engineers, service engineers, vessel engine operators, vessel deck operators, superintendents.

Prerequisites:
Prior to enroll, H830 is highly suggested.

Venue: Genoa, Italy

Additional information:
Minimum 6, maximum 8 participants.
H921 – ABB Ability™ Marine Software - OCTOPUS OFFICE

This course prepares project engineers and naval architects for running valid analyses and using their results for various purposes including importing them to OCTOPUS Onboard.

Learning objectives:
Upon completion of this course the participants will be able to:
• Operate the OCTOPUS OFFICE software in the most efficient way
• Understand its capabilities and functionality
• Identify potential errors and solve them
• Know how to use the extension modules and prepare the input in order to maximize the output accuracy

Contents:
• Creation of 2D and 3D hull models
• Modification of existing hull models
• Creation of 2D hydrodynamic databases
• Creation of RAO’s based on a 2D/3D hydrodynamic database and loading condition
• Creation and import of loading condition
• Creation and import of sea states
• Automatic selection of best matching sea state dependent RAO with sea state in short term statistic calculations
• Calculation of design criteria which can be used in OCTOPUS Onboard
• Creation of reports
• Export of results

Methods:
Presentation
Hands-on exercises using software

Duration: 1 day (8 hours)

Student profile:
All personnel using OCTOPUS OFFICE, naval architects, project engineers, nautical superintendents, maritime students.

Prerequisites:
At least basic knowledge of vessel motions and marine terminology; Strong analytic skills

Venue:
• Rotterdam, Netherlands
• Customer site

Additional information:
Maximum 6 participants.
H922 – ABB Ability™ Marine Software - OCTOPUS Onboard Basic

This course prepares deck officers for using OCTOPUS advisory system in the most efficient and effective way.

Learning objectives:
Upon completion of this course the participants will be able to:
• Explain the OCTOPUS system architecture and identify the functions of its components
• Design graphs for outputting the required data in real time
• Understand the basics of vessel motions, velocities and accelerations
• Maximize the quality of input data for the system
• Accurately translate the system output into clear advices
• Implement and understand criterions
• Troubleshoot most common basic problems
• Give the on-site introduction of the system

Methods:
• Instructor led course with interactive classroom discussions and associated workshop exercises
• Approximately 25% of the time is used for practical exercises

Duration: 1 day (8 hours)

Student profile:
The training is targeted to ship officers, project engineers and cargo superintendents. It is also beneficial for sales specialists to follow this course in order to get the inside knowledge before offering OCTOPUS.

Prerequisites:
The students shall have a basic understanding of vessel operations and marine terminology. Participants can meet our prerequisites by attending one of our e-learning courses.

Venue:
• Rotterdam, Netherlands
• Customer location

Additional information:
When the complete classroom originates from one company, specific cases (based on the client operated vessels) will be presented and discussed.
H923 – ABB Ability™ Marine Software - OCTOPUS Onboard Commissioning

This course prepares participants to properly mount the hardware related to OCTOPUS and make sure all the signals are valid and configured within the scope of a supply.

Learning objectives:
Upon completion of this course the participants will be able to:
• Explain the OCTOPUS system architecture and identify the functions of its components
• Create a new project and configure basic OCTOPUS modules
• Maximize the quality of input data for the system
• Accurately translate the system output into clear advice
• Connect and configure external devices to OCTOPUS
• Identify and connect correct signals to OCTOPUS
• Commission the system
• Give the on-site introduction of the system
• Provide first level of support

Contents:
• Benefits of having OCTOPUS
• Data types, Creating and importing new projects
• Time traces, Alarms and warnings, Virtual points
• OCTOPUS user interface, Creating custom dashboards
• Measurements, Statistical operators, Real-time graphs
• Time traces, Alarms and warnings, Virtual points
• Data sharing based on weather forecast, Data logging
• Serial data connections, Network data connections
• Network sharing and firewalls, File based interfaces
• NMEA protocol, MODBUS protocol
• Sensor and Hardware mounting, Hardware FAT procedure
• Complete system commissioning

The participant of this course will possess extend user knowledge allowing him to give the introduction to the system while on site.

Duration: 2 days (16 hours)

Student profile:
The training is targeted to service engineers, ETOs, technical superintendents and electrical engineers.

Prerequisites and recommendations:
The students shall have a basic understanding of vessel operations and marine terminology. They will be familiar with at least NMEA and MODBUS protocols in both TCP/IP and serial versions. Participants can meet our prerequisites by attending one of our e-learning courses.

Venue:
• Rotterdam, Netherlands
• Customer location

Additional information:
When the complete classroom originates from one company, specific cases (based on the client operated vessels) will be presented and discussed. Please note that a notebook with OCTOPUS software is provided by the training facility. If you wish to use your notebook, please let us know before the course will take place. This course is considered to be obligatory for personnel who wishes to commission OCTOPUS systems.
ABB Ability™ Marine Pilot Control & Pilot Vision

Learning objectives:
Learning how to use either program correctly. This can be everything from improving ‘passenger comfort in DP-mode’ to ‘safe docking’ and the utilization of ‘braking assistance’. The course will enable the user to understand the flexibility of the programs and using them to their maximum potential.

Contents:
Pilot Control
• The correct use of the program and software
• Benefits using ABB’s own DP algorithms
• Changing effects and loads during operation
• Use of joystick and its range of possibilities

Pilot Vision
• The correct use of the program and software
• Basic and Advanced settings during normal operations
• System behavior in different situations
• Safety aspects - what is happening and why
• Data recollection, learning and evolving

Methods:
Interactive Classroom lectures and workshops.

Duration: 2 days

Student profile: Deck personnel at operational level.

Prerequisites: None

Venue:
• Helsinki, Finland
• Onboard vessel

Additional information:
Minimum 6, maximum 20 participants.
General terms and conditions

Course price includes:
• A qualified instructor with up-to-date technical knowledge and teaching experience
• Training room with infrastructure and training equipment
• Lunch, coffee and refreshments
• Training documentation

Application
In order to arrange and supply the scope of the course, the purchase order and time schedule should be confirmed by the customer 4 weeks prior to the starting date of training.

Travel and accommodation costs
Airline tickets, travel time, accommodation, local transportation of the participants and meals except lunch are not included in the price. ABB Marine Academy can assist in handling accommodation and local transport. These expenses will be charged based on costs + 10% administration fee.

Changes
ABB Marine Academy reserves the right to change names of instructors, and modify the program and contents within scope of the course.

Cancellation
In case of cancellation please advise us as soon as possible. Please note that if a participant is unable to attend the course within the cancellation period the booking can be used by another person within the company.
• Cancellation 1-2 weeks prior to the course schedule: 50% of course fee will be charged
• Cancellation less than 1 week prior to the course schedule: 100% of course fee will be charged

Azipod vessel operation courses cancellation clause:
• 4-6 weeks before scheduled course: 50% of course fee will be charged
• Less than 4 weeks before scheduled course: 100% of course fee will be charged

Requirements for training in locations other than ABB Marine Academy premises
Please see ABB Marine Academy Guidelines sent together with quotation for more details.
ABB Marine Academy locations

Singapore
2 Ayer Rajah Crescent
Singapore
Phone: +65 6776 5711

Helsinki
Merenkulikijankatu 1
00980 Helsinki
Finland
Phone: +358 10 2211

Rotterdam
George Hintzenweg 81
3068 AX Rotterdam
Netherlands
Phone: +31 10 407 8867

Houston
3700 West Sam Houston Parkway
South
77042 Houston, USA
Phone: +1 713 587 8000
Partner locations: ABB University (world wide network)

Genoa
Via al Molo Giano
16128 Genova
Italy
Phone: +39 010 2752 311

Ulsteinvik
Stalhaugen 5
6065 Ulsteinvik
Norway
Phone: +47 2287 2000

Shanghai
ABB Engineering (Shanghai) Ltd.
Deliver To:
No.5 lane 369,Chuangye Road Kangqiao Town,
Nanhui District ,Shanghai (201319),PRC
Tel: +86(0)21 6105 6666

Contact:
marine.academy@fi.abb.com
Additional information
We reserve the right to make technical changes or modify the contents of this document without prior notice. With regard to purchase orders, the agreed particulars shall prevail. ABB AG does not accept any responsibility whatsoever for potential errors or possible lack of information in this document.

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