



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.

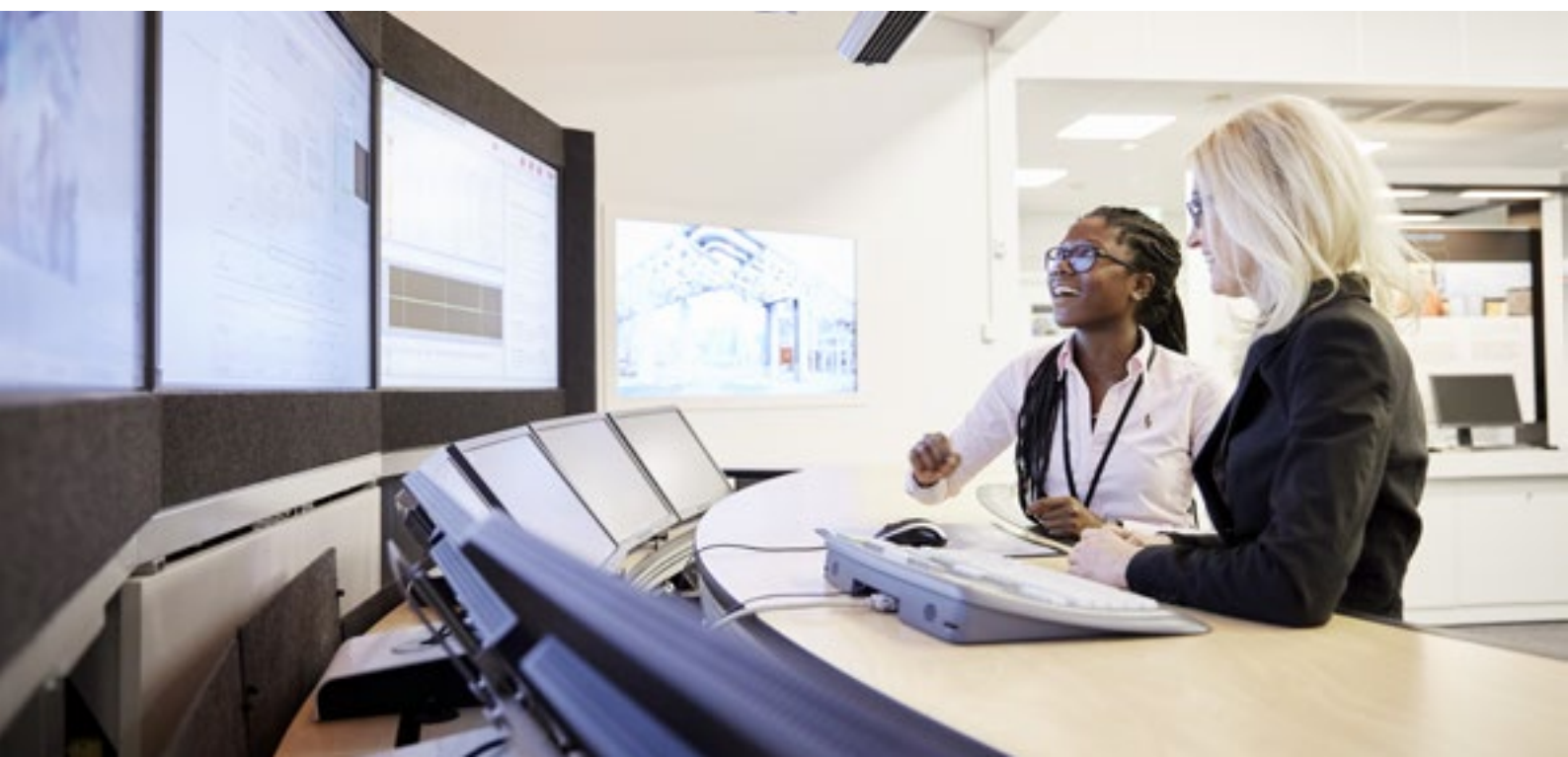
In practice, this means we have improved our training portfolio. We offer more product and system courses, and better options for on-site training and coaching. We have also improved our training material to support trainees after the completion of their course. We make continuous improvements by collecting 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

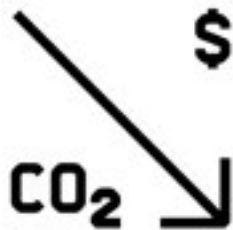
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ABB Marine Academy has set itself two targets: first, we want to provide our customers' crew with the right kind of training that enables them to do their job safely and better; and second, we need to support our customers' corporate management in 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

H905 – PCS Propulsion Control System for Operators

H911/H910K – ACS800LC/ACS800 Drilling Drives System

H872 – Low Voltage Drive System, Operation, Maintenance and Troubleshooting

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 (Only available at Helsinki)

Duration:

3 days (+1 day for Azipod® if required only in Helsinki)

Student profile:

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

Prerequisites:

None

Venue:

- Helsinki, Finland
- Genoa, Italy
- Rotterdam, Netherlands

Additional information:

Minimum 6, maximum 10 participants;
On-site training is available on request.



H905 – PCS Propulsion Control System Operator Course

The goal of this course is to train the participants to understand and maintain the propulsion control system with AC800M application.

Learning objectives:

Upon completion of this course, students will be able to understand the function of the electrical propulsion control system. The participants could troubleshoot and restore the propulsion control system in case there are control components failure.

Contents:

- General topics
 - Propulsion system introduction
 - Control system architecture
 - Control place and selection
 - Principal control function and interlocking
 - Power limitation and protection
 - Dealing with faults
 - Control system components

- Fault-tracing and troubleshooting
 - Alarm and event handling
 - System monitoring
 - Backup/restore control system
 - Handling communication problem
 - Remote Diagnostic System (RDS)

Methods:

This is an instructor-led course with interactive classroom discussions and associated lab exercises. Approximately 40% of the course is comprised of hands-on lab activities.

Duration:

2 days

Student profile:

Marine engineers and electro-technical personnel at operational and maintenance level.

Prerequisites:

The participants should have fundamental knowledge of vessel operation. Completion of ACS6000/6080 and ACS800/880 marine drive course or similar knowledge is advisable.

Venue:

- Singapore

Additional information:

Minimum 4, maximum 8 participants; On-site training is available on request.



H911/H910K – ACS800LC/ACS800 drilling drives system

The goal of this course is to learn how to start-up, operate, maintain and troubleshoot ABB ACS800LC/ACS800 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, in-verter 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.

Contents:

- 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

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

Additional information:

Minimum 6, maximum 8 participants; On-site training 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:

- Lucca, Italy
- Rotterdam, Netherlands
- Other locations on request

Additional information:

Minimum 6, maximum 8 participants.



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

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:

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.

Venues:

- Genoa, Italy

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 wobjectives:

After completing the course successfully, the student will have a comprehensive background of the marine power plants and will be able to 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:

- Genoa, Italy
- Rotterdam, Netherlands
- Singapore

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:

4 days

Student profile:

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

Prerequisites and recommendations:

None

Venue:

- Rotterdam, Netherlands

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

H865 – Marine ACS6080 Operation & Maintenance

H866 – STADT x-AC-y-z 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
- Turgi, Switzerland

Additional information

Minimum 4, maximum 8 participants;
On-site training is available on request.



H865 – Marine ASC6080 Operation & Maintenance

The goal of this course is to train the participants in the safe operation, control, configuration, troubleshooting and maintenance of the ACS6080. The students will develop their knowledge, confidence and skills in the handling of ACS6080 Voltage Source Inverter.

Learning objectives:

The course goal is to teach students how to operate, maintain and troubleshoot the ACS6080 drive. Upon completion of this course, the students will be able to locate the hardware components, to verify and replace drive's parts and to perform preventive maintenance. The use of the available programming and troubleshooting tools is taught by practical operating exercises.

Contents:

- Generalities
 - ACS6080 family overview, system requirements
 - AC motor and DTC control
 - Drive specific safety requirements
- Hardware description (power electronics & control)
 - Component and PCB functions
 - Hardware schematics and electrical drawings
 - PCB settings and configuration
- Water cooling system
 - Cooling circuits description
 - Preventive maintenance operation
 - Energize / de-energize, start / stop sequence
 - Local operation with drive control panel and Drive Composer tool
 - Remote control
- Software introduction
 - Software structure, parameters description
 - Application configuration
- Fault tracing and troubleshooting
 - Alarm and fault indications
 - Checking and replacing PCB's and components
 - Using Drive Composer SW tool for configuration and troubleshooting
 - How to get help from ABB

Methods:

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

Duration:

4 days

Student profile:

Electricians, technicians and engineers who operate, maintain or troubleshoot ACS6080.

Prerequisites:

- Basic knowledge of AC motors and drives
- Basic knowledge using Windows computers

Venue:

- Singapore
- Turgi, Switzerland

Additional information:

Minimum 4, 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:

- Singapore

Additional information:

Minimum 4, Maximum 6 participants



Azipod® Propulsion

H880 – Azipod® CO Technical Training

H880 – Azipod® DO Technical Training

H881 – Azipod® VO Technical Training

H882 – Azipod® XO Technical Training

H929 – Azipod® MO Technical Training

H886 – Azipod® Space Safety & Azipod® XO Technical Blended Learning

H887 – Azipod® Space Safety & Azipod® VI Technical Blended Learning

H883 – Azipod® Vessel Operation Operational Level

H884 – Azipod® Vessel Operation, Onboard Coaching

H885 – Azipod® Vessel Operation, Management Level

H888 – Triple Azipod® Vessel Operation, Operational Level

H889 – Triple Azipod® Vessel Operation, Managamenet Level

**H885R – Twin or Triple Azipod® Vessel Operation refresher course,
Managamenet 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 8 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.



H929 – Azipod® MO Technical Training

This course provides a basic understanding of Azipod® MO propulsion system, and how to operate, maintain and troubleshoot the system components. Participants will understand the possible risks and hazards when working in and around the Azipod® unit space, as well as learn dealing the risks.

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 troubleshoot systems and perform adjustments on specific system components.

Upon completion of this part of course the participants will be able to:

- Perform adjustments on critical system components e.g. ACS880
- Know Azipod® MO main components, Azipod® MO Propulsor subsystems and their main functions
- Understand the use of ABB Technical manuals and perform proper Troubleshooting for different Azipod® MO systems

Contents:

- Terminology and evolution of Azipod® propulsion
- Azipod® Propulsor Technical Specification
- Safety procedures while working on the Azipod®
- ACS880 Steering drive adjustment and troubleshooting
- Azipod® System Troubleshooting
- Azipod® Simulator

Methods:

Lectures; Group discussions; Group work; Hands-on group exercises; Visits to machine factory and Azipod® assembly factory

Duration:

5 days

Student profile:

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

Prerequisites and recommendations: Marine Power Plant Basic for Technical Staff from ABB Marine Academy are advisable. Satisfactory health condition to be able to work inside a confined space.

Venue: Helsinki, Finland

Additional information:

Minimum 6 participants and maximum 8 participants.



H886 – Azipod® Space Safety & Azipod® XO Technical Blended Learning

Blended learning is a combination of webinars, self-studies, classroom training, and hands-on exercises.

This course provides a deeper understanding of the Azipod XO propulsion system, and how to operate, maintain, and troubleshoot the system components. Participants will understand the possible risks and hazards when working in and around the Azipod unit space, as well as learn how to deal with the risks and improve their readiness in the case of an emergency.

Learning objectives:

Theory (Remote):

Participants will be able to describe the functions of the different sub-systems of the Azipod propulsion system and how they interact. Upon completion of this part of the course, the participants will be able to:

- identify the different hazards risks and the possible,
- consequences when working inside the Azipod unit's space.

Hands-on (Helsinki):

They will understand the importance of correct maintenance, be able to describe the monitoring possibilities, and how to troubleshoot systems and perform adjustments on specific system components. Upon completion of this part of the course, the participants will be able to:

- 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:

Theory (Remote):

- Confined space regulation
- Basics of OSHA
- Safety aspects inside the Azipod unit
- Terminology and evolution of Azipod propulsion
- Azipod Propulsor Technical Specification
 - Slip-ring unit technology and maintenance
 - Power and data transmission system
 - Hydraulic steering gear

Hands-on (Helsinki):

- Occupational risks with Azipod propulsion
- 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
- Electrical Safety concerning Azipod Entry
- Safety procedures while working on the Azipod
- ACS8x0 steering gear drive programming, adjustment and troubleshooting

Methods:

Theory (Remote):

- Theory lessons via Teams and discussions about Azipod XO systems
- Self-studies via Claned - learning platform

Hands-on (Helsinki):

- Workshop exercises with demonstration equipment
- Lectures, group discussions and group work
- Exercises in simulated space
- Visits to machine factory and Azipod assembly factory

Duration:

Theory (Remote): 2 days Teams meetings + 2 days self-studies

Hands-on (Helsinki): 5 days

Student profile:

Deck, engine, and electro-technical personnel responsible for Azipod® entry operations and personnel who conduct Azipod space maintenance.

Prerequisites:

Marine Power Plant Basic for Technical Staff from ABB Marine Academy is advisable. Satisfactory health condition to be able to work inside a confined space.

Venue

- Helsinki, Finland

Additional Information:

Minimum 6, maximum 8 participants.

H887 – Azipod® Space Safety & Azipod® VI Technical Blended Learning

Blended learning is a combination of webinars, self-studies, classroom training, and hands-on exercises.

This course provides a deeper understanding of the Azipod VI propulsion system, and how to operate, maintain, and troubleshoot the system components. Participants will understand the possible risks and hazards when working in and around the Azipod unit space, as well as learn how to deal with the risks and improve their readiness in the case of an emergency.

Learning objectives:

Theory (Remote):

Participants will be able to describe the functions of the different sub-systems of the Azipod propulsion system and how they interact. Upon completion of this part of the course, the participants will be able to:

- identify the different hazards risks and the possible consequences when working inside the Azipod unit's space.

Hands-on (Helsinki):

They will understand the importance of correct maintenance, be able to describe the monitoring possibilities, and how to troubleshoot systems and perform adjustments on specific system components. Upon completion of this part of the course, the participants will be able to:

- 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
- perform adjustments on critical system components e.g. hydraulic steering gear pump, EMRI servo unit ASU36X.

Contents:

Theory (Remote):

- Confined space regulation
- Basics of OSHA
- Safety aspects inside the Azipod unit
- Terminology and evolution of Azipod propulsion
- Azipod Propulsor Technical Specification
 - Slip-ring unit technology and maintenance
 - Power and data transmission system
 - Hydraulic steering gear

Hands-on (Helsinki):

- Occupational risks with Azipod propulsion
- 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
- Electrical Safety concerning Azipod Entry
- Safety procedures while working on the Azipod
- EMRI Servo ASU 36X adjustment and troubleshooting

Methods:

Theory (Remote):

- Theory lessons via Teams and discussions about Azipod VI systems
- Self-studies via Canvas - learning platform

Hands-on (Helsinki):

- Workshop exercises with demonstration equipment
- Lectures, group discussions and group work
- Exercises in simulated space
- Visits to machine factory and Azipod assembly factory

Duration:

Theory (Remote): 2 days Teams meetings + 2 days self-studies

Hands-on (Helsinki): 5 days

Student profile:

Deck, engine, and electro-technical personnel responsible for Azipod® entry operations and personnel who conduct Azipod space maintenance.

Prerequisites:

Marine Power Plant Basic for Technical Staff from ABB Marine Academy is advisable. Satisfactory health condition to be able to work inside a confined space.

Venue

- Helsinki, Finland

Additional Information:

Minimum 6, maximum 8 participants.

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.

Contents:

- Azipod vessel operation and propulsion system behaviour in all conditions
- Azipod vessel system functionalities, power plant, propulsion system malfunctions
- Azipod vessel resource management and bridge communication

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.



H888 – Triple Azipod® Vessel Operation, Operational Level

This course prepares bridge personnel for basic use and maneuverability on triple Azipod® vessels in normal and special operational conditions.

Learning objectives:

Upon completion of this training, the participants will know the operational principles of a triple Azipod® propulsion systems. They will understand the flexibility of the system and will be able to utilize it to its maximum capability. Also, identifying potential malfunctions and how to cope with them without sacrificing vessels 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 in different conditions, berthing/un-berthing
- Effects of Azipod® thrust in different angle setups

Methods

Hands-on exercises on a full mission bridge simulator; Practical lessons and discussions on the 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 ABB approved maritime simulation center.



H889 – Triple Azipod® Vessel Operation, Managamenet Level

Management level workshop on triple Azipod® cruise vessels. 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 a triple Azipod® vessel. They will be able to fully utilize the flexibility of the third Azipod® unit and learn its benefits and the advantages it gives during maneuvers in port.

Also, bridge resources management will be emphasized.

Contents:

- Azipod® vessel operation and propulsion system behavior in all conditions
- Azipod® vessel system functionalities, power plant, propulsion system malfunctions
- Azipod® vessel resource management and bridge communication

Methods

Training consists of discussions, lessons, and 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:

Experience of Azipod® vessel operations.

Venue:

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

Additional information:

Maximum 6 participants.

This workshop is run in conjunction with an ABB approved maritime simulation center.



H885R – Twin or Triple Azipod® Vessel

Operation refresher course, Management Level

Management level workshop on twin or triple Azipod cruise vessels.
Operation and handling ‘refreshment’ course for advanced Azipod personnel.
The course will be set in different ports, covering complex operations, malfunctions, and bridge communication.

Learning objectives:

Upon completion of this training, the participants will have brushed up on their skills and acquired a deeper understanding of the operational principles of an Azipod vessel and its limitations. The progress of training never ends, all new docking principles shown and tested.

Bridge resources management will be emphasized, new ways of delivering verbal commands included.

Contents:

- Azipod® propulsion system behavior in all conditions.
- Azipod® vessel system functionalities, new deeper knowledge on the ABB components and the actual build up in the Azipod®.
- One day for propulsion system malfunctions repetition.

Methods

Training consists of discussions, lessons, and bridge simulator exercises to ensure learning at top level. The participants will be challenged to self-enquire a training scenario that other participants must perform.

Duration: 3 days

Student profile:

Azipod® vessel deck personnel at management level.

Prerequisites:

Experience of Azipod® vessel operations.

Venue:

- Marine Training Center Hamburg GmbH, Germany

Additional information:

Maximum 6 participants.

This workshop is run in conjunction with an ABB 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 8 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.

Contents:

- Azipod vessel operation and propulsion system behavior in all conditions
- Azipod vessel system functionalities, power plant and propulsion system malfunctions
- Azipod vessel resource management and bridge communication

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

H893 – Marine System 800xA Operation

H894 – Marine 800xA Automation Training

H898 – DEGO III Electronic Governor Systems

H900 – Power Management System – Electro Technical Course

H902 – Marine Application with AC800M for LNG, tankers and Drilling

H893 – Marine System 800xA Operation Course

The goal of this course is to train the participants how to navigate and maintain the System 800xA marine application.

Learning objectives:

Upon completion of this course, participants will be able to understand the vessel system 800xA architecture and functions. The participants could interpret information from different displays and handle alarm and event information. The participants will be able to troubleshoot and restore the system in case there are control components failure.

Contents:

- General topics
 - Explain the vessel related system architecture and functions
 - Control system components
 - Navigate the vessel Operator Workplace
 - Monitor and control process objects such as generator, motors and pumps
 - Interpret information on interlocks
 - Describe the principles of historical data and trend display
 - Log in as different users
- Fault-tracing and troubleshooting
 - Alarm and event handling
 - System monitoring
 - Backup/restore AC800M control system
 - Handling communication problem
 - Remote Diagnostic System (RDS)

Methods:

This is an instructor-led course with interactive classroom discussions and associated lab exercises. Approximately 60% of the course is comprised of hands-on lab activities.

Duration:

2 days

Participants profile:

Marine engineers and electro-technical personnel at operational and maintenance level. Vessel Management System or Power Management system with 800xA application.

Prerequisites:

The participants should have fundamental knowledge of vessel operation.

Venues:

- Singapore

Additional information:

Minimum 4, maximum 6 participants; On-site training is available on request.



H894 – Marine 800xA 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.

Possible contents: (to be agreed advance):

- 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 Industrial 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:

based on the agreed content

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
- Singapore

Additional information:

Minimum 6, maximum 8 participants.





H898 – DEGO III

Electronic Governor Systems

The goal of this course is to train the participants in safe operation, troubleshooting, tuning and basic repairs of DEGO 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 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:

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.



H902 – AC800M applications for LNG, tankers and drilling

The goal of this course is that the participants shall be able to conduct troubleshooting as well as performing backup and recovery of the AC800M control system used in the Marine environment.



Learning objectives

Upon completion of this course, the participant will be able to explain the AC800M system configuration and function of the components. In addition the participant can troubleshoot and exchange AC800M system hardware, as well as carry out backup and recovery safely.

Contents

- General topics
 - System function of AC800M in Marine application
 - AC800M control system
 - AC800M configuration and troubleshooting
- Hardware operation
 - AC800M system structure and the function of different components
 - AC800M preparation
 - Connect Process Panel and Demo Drive unit
 - Exchange AC800M hardware and Process Panel
 - Troubleshoot and recover AC800M system
- Operation
 - Describe the structure of application programs
 - Download configuration to AC800M
 - Connect S800 I/O and trace signal
 - Communication with Process Panel
 - ABB drives integration
 - System backup and maintenance

- Software
 - DriveWindow
 - Compact Control Builder
 - Panel Builder
- Fault-tracing and troubleshooting
 - AC800M hardware/firmware mismatch
 - S800 I/O warning and alarm
 - Process panel communication failure
 - Drive communication failure

Methods

Classroom lectures;
Practical lessons on training simulator and ACS800 demount.

Student profile

Electro-technical personnel at operational level.

Prerequisites

Students should know the fundamentals of working with automation control systems and Microsoft Windows. ABB drilling drive system or similar knowledge is advisable.

Duration

5 days

Venue

Singapore

Additional Information

Minimum 4, maximum 8 participants.

Safety and STCW

H852 – HV Safety Management STCW, MCA UK Approved

H850 – Azipod® Space Safety

H852 – HV Safety Management STCW, MCA UK 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).

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 meet one of the following conditions:

- Prior electrical or electro-technical experience in a shipboard environment, or,
- Have completed 12 months sea time as EOOW, or,
- Part of an initial electro-technical training program

Venue:

- Genova, Italy

Additional information:

Minimum 6, maximum 8 participant.

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

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

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 a clear advices
- Implement and understand criterions
- Troubleshoot most common basic problems
- Give the on-site introduction of the system

Contents:

- Benefits of having OCTOPUS
- OCTOPUS user interface
- Polar diagram
- Responses
- Weather windows
- Measurements
- Statistics operators
- Real time graphs
- Alarms and warnings

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 advices
- 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 (except Italy), 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**

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Singapore
Phone: +65 6776 5711

Helsinki

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00980 Helsinki
Finland
Phone: +358 10 2211

Rotterdam

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

Miramar (Coordination)

11600 Miramar Parkway
FL 33025
United States
Phone: +1 9543299986

Genoa

Via al Molo Giano
16128 Genova
Italy
Phone: +39 02 3653 0967 – PIN 9001

Fornebu

Snarøyvn. 30
1360 Fornebu, Oslo
Norway
Phone: +47 2287 2000

Shanghai

ABB Engineering (Shanghai) Ltd .
Deliver To:
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Nanhui District , Shanghai (201319), PRC
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Partner locations: ABB University (world wide network)

Contact:

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new.abb.com/marine/systems-and-solutions/service/training

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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