

# Reach your true potential

OPTIMAL EQUIPMENT  
PERFORMANCE

GLOBAL TRAINING  
SOLUTIONS

**WÄRTSILÄ** Training Services

**WÄRTSILÄ LAND & SEA ACADEMY  
TRAINING PROGRAMME CATALOGUE**



**WÄRTSILÄ**

[WWW.WARTSILA.COM](http://WWW.WARTSILA.COM)

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As the total service provider, we offer solutions that cover every aspect of proactive service and customer support. We let you concentrate on your core business and provide you the chance to maximize your return on investment. The lowest costs, in the most efficient way possible while meeting environmental targets. This is achieved in Wärtsilä's training programs.

This dedicated commitment is in place to meet the training requirements of customers. We set and monitor the high quality needed to satisfy international standards within the extensive training programs covering management, operation, maintenance and safety issues for marine and power plant personnel.

With the tested training strategy, global network of training centres, and qualified personnel, we deliver a thorough understanding of how to optimize the availability and performance of your long-term business plans.

We offer customer tailored courses to help you to achieve your business goals. Wärtsilä Land & Sea Academy is familiar with the global training environment and can advise you directly regarding the options available.

Let us be part of your competence management plan.

## WÄRTSILÄ PRODUCT COURSES (4-STROKE)

ENGINE THEORETICAL  
ENGINE OPERATION AND PRACTICAL  
ENGINE PRACTICAL  
TAILOR-MADE COURSE



# ENGINE THEORETICAL

## COURSE OBJECTIVE

The trainees will be able to maintain the engine in a safer way and will contribute more effectively to the operation of the machinery. They will learn the basics of evaluation of engine operating parameters and maintenance planning.

## CONTENT OF THE COURSE

- Engine design and function
- Start, stop and operation
- Function of built-on engine systems
- Engine maintenance schedule
- Fuel injection equipment
- Evaluation of engine operating parameters
- Engine Automation and Control System

## PREREQUISITES

The trainees should have a basic knowledge of engine principles and some operational experience of engines. Theoretical education on internal combustion engines preferred.

Course Data			
Target Group	This engine training course is designed for ship crew at the operational and management levels, and power plant senior or middle management.		
Duration	3 working days		
Course Availability	Available Engine Type and Courses are also available onsite.		
Busan, South Korea	Wärtsilä 20 Wärtsilä 20DF Wärtsilä 26	Wärtsilä 32 Wärtsilä 34DF Wärtsilä 34SG	Wärtsilä 46 Wärtsilä 46F Wärtsilä 50DF
Drunen, the Netherlands	Wärtsilä 20 Wärtsilä 20DF Wärtsilä 26	Wärtsilä 32 Wärtsilä 34DF Wärtsilä 38	Wärtsilä 46 Wärtsilä 50DF
Fort Lauderdale, USA	Wärtsilä 20 Wärtsilä 20DF Wärtsilä 26 Wärtsilä 32	Wärtsilä 34DF Wärtsilä 34SG Wärtsilä 46 Wärtsilä 50DF	Wärtsilä 46CR Wärtsilä 50SG Engine ZA40S
Jakarta, Indonesia	Wärtsilä 32 Wärtsilä 34SG	Wärtsilä 34DF Wärtsilä 50DF	Wärtsilä 50SG
Khopoli, India	Wärtsilä 20 Wärtsilä 26	Wärtsilä 32 Wärtsilä 34SG	Wärtsilä 34DF Wärtsilä 50DF
Rio de Janeiro, Brazil	Wärtsilä 20 Wärtsilä 26 Wärtsilä 32 Wärtsilä 34SG	Wärtsilä 34DF Wärtsilä 46 Wärtsilä 46F Wärtsilä 46GD	Wärtsilä 50SG Wärtsilä 50DF
Trieste, Italy	Wärtsilä 26 Wärtsilä 38	Wärtsilä 46 Wärtsilä 46F	Wärtsilä 50DF Engine ZA40S
Turku, Finland	Wärtsilä 20 Wärtsilä 20DF Wärtsilä 31 Wärtsilä 31DF Wärtsilä 31SG Wärtsilä 32	Wärtsilä 32CR Wärtsilä 34DF Wärtsilä 34SG Wärtsilä 46 Wärtsilä 46CR Wärtsilä 46DF	Wärtsilä 46F Wärtsilä 46F CR Wärtsilä 50SG Wärtsilä 50DF

# ENGINE OPERATION AND PRACTICAL

## COURSE OBJECTIVE

The trainees will be able to maintain the engine safely and contribute effectively to the operation of the machinery. They will learn the basics of evaluation of engine operation and maintenance planning.

## CONTENT OF THE COURSE

- Engine design and function
- Start, stop and operation
- Function of built-on engine systems
- Engine maintenance schedule
- Fuel injection equipment
- Evaluation of engine operating parameters
- Maintenance operations, hands-on training
- Engine Automation and control system

## PREREQUISITES

The trainees should have a basic knowledge of engine principles and some operational experience of engines. Theoretical education on internal combustion engines preferred.

Course Data			
Target Group	This course is designed for ship crew at the operational and management levels and power plant middle and senior management.		
Duration	5-8 working days		
Course Availability	Available Engine Type. Courses are also available onsite excl. hands-on.		
Busan, South Korea	Wärtsilä 20 Wärtsilä 32 Wärtsilä 34SG	Wärtsilä 34DF Wärtsilä 46 Wärtsilä 50DF	Wärtsilä 20DF
Drunen, the Netherlands	Wärtsilä 20 Wärtsilä 20DF	Wärtsilä 32 Wärtsilä 34DF	Wärtsilä 46 Wärtsilä 50DF
Fort Lauderdale, USA	Wärtsilä 20 Wärtsilä 20DF Wärtsilä 50DF	Engine ZA40S Wärtsilä 32 Wärtsilä 34SG	Wärtsilä 34DF Wärtsilä 46 Wärtsilä 50SG
Jakarta, Indonesia	Wärtsilä 32 Wärtsilä 34SG	Wärtsilä 34DF Wärtsilä 50DF	Wärtsilä 50SG
Khopoli, India	Wärtsilä 32		
Rio de Janeiro, Brazil	Wärtsilä 20 Wärtsilä 26 Wärtsilä 32 Wärtsilä 34SG	Wärtsilä 34DF Wärtsilä 46 Wärtsilä 46F Wärtsilä 46GD	Wärtsilä 50SG Wärtsilä 50DF
Trieste, Italy	Wärtsilä 26 Wärtsilä 38	Wärtsilä 46 Wärtsilä 50DF	Engine ZA40S
Turku, Finland	Wärtsilä 20 Wärtsilä 32 Wärtsilä 20DF Wärtsilä 31 Wärtsilä 31DF Wärtsilä 31SG	Wärtsilä 32CR Wärtsilä 34DF Wärtsilä 34SG Wärtsilä 46F CR Wärtsilä 46CR Wärtsilä 46DF	Wärtsilä 46F Wärtsilä 46 Wärtsilä 50DF Wärtsilä 50SG

# ENGINE PRACTICAL

## COURSE OBJECTIVE

Upon completion of the training course, the trainees are able to carry out daily and scheduled maintenance in practice. Familiarisation of all engine related special tools, measuring equipment and basic engine adjustments.

## CONTENT OF THE COURSE

- Introduction and preparation of hands-on activities
- Maintenance schedule
- Maintenance, operations, hands-on training

## PREREQUISITES

The trainees should have a basic knowledge of engine principles and some operational experience of the engines. Theoretical education on internal combustion engines is preferred.

Course Data			
Target Group	The hands-on training course is designed for ship crew at the support or operational levels, and power plant personnel, taking part in their daily and scheduled maintenance routines.		
Duration	5 working days		
Course Availability	Available Engine Type		
Busan, South Korea	Wärtsilä 20 Wärtsilä 32	Wärtsilä 46 Wärtsilä 50DF	Wärtsilä 20DF
Drunen, the Netherlands	Wärtsilä 20	Wärtsilä 20DF	
Fort Lauderdale, USA	Wärtsilä 20 Wärtsilä 32	Wärtsilä 46	Engine ZA40S
Jakarta, Indonesia	Wärtsilä 32 Wärtsilä 34SG	Wärtsilä 34DF Wärtsilä 50DF	Wärtsilä 50SG
Rio de Janeiro, Brazil	Wärtsilä 32	Wärtsilä 34DF	Wärtsilä 34SG
Trieste, Italy	Wärtsilä 26 Wärtsilä 38	Wärtsilä 46 Wärtsilä 50DF	Engine ZA40S
Turku, Finland	Wärtsilä 20 Wärtsilä 20DF Wärtsilä 31 Wärtsilä 31DF Wärtsilä 31SG Wärtsilä 32	Wärtsilä 32CR Wärtsilä 34DF Wärtsilä 34SG Wärtsilä 46 Wärtsilä 46CR Wärtsilä 46DF	Wärtsilä 46F Wärtsilä 46F CR Wärtsilä 50DF Wärtsilä 50SG

# TAILOR-MADE COURSE ACCORDING TO CUSTOMER NEEDS

## COURSE OBJECTIVE

Target of the Tailor-made course is to create a training solution that fits 100% your actual needs, installation and/or fleet. Time not used on well known subjects. Content will be dedicated to deepen the knowledge in engine technology, in-detail presentation of systems and components and operational aspects on the simulator.

Optimized time for learning to increase trainees competencies to operate and maintain engines in a safe and economic way.

## CONTENT OF THE COURSE

- Course content can be a remix of the Learning Objectives of standard courses (e.g. focusing more on specific topics)
- New Learning Objectives can be included, e.g. troubleshooting, performance evaluation and component condition evaluation, according to customer needs.

## PREREQUISITES

Those can vary based on the defined content of the course.

### Course Data

To create the course together with us, please contact the appropriate WLSA training centre with the requested engine type available.



# ON-THE-JOB TRAINING (WLSA OJT)

## COURSE OBJECTIVE

WLSA OJT is a well-structured skills training and assessment solution with the following objectives:

- The instructor introduces and explains the theoretical part of the task in the classroom
- The instructor demonstrates the task in practice and participants learn by observing
- Each participant performs the task by themselves while the instructor monitors and assesses their skills. During this phase, competence-gap analysis is carried out individually

## CONTENT OF THE COURSE

WLSA OJT training covers four main areas:

- Safety
- Operation
- Minor maintenance
- Electrical and automation

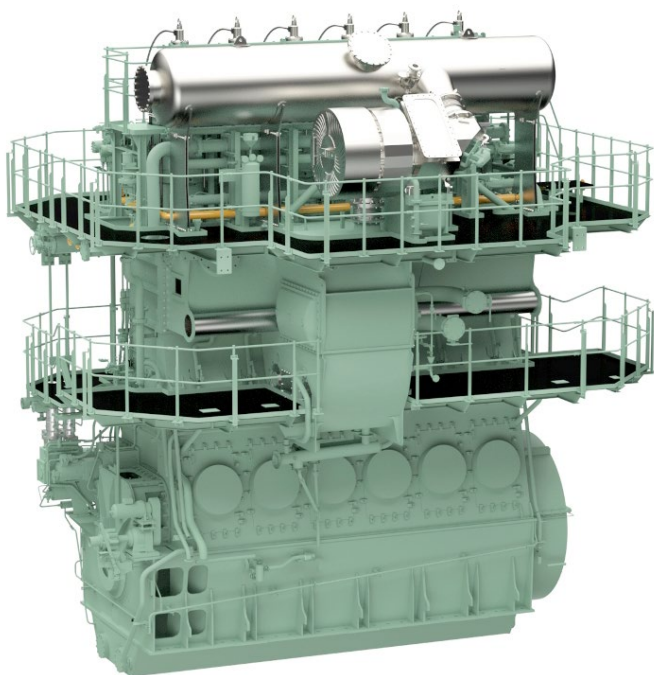
## PREREQUISITES

The trainees should have a basic knowledge and operational experience of the installation's mechanical and/or electrical systems.

Course Data	
Target Group	This training course is aimed for personnel operating and managing installation with Wärtsilä equipment and systems.
Duration	Recommended duration sixty (60) working days: 30 days mechanical training + 15 days electrical training + 15 days engine automation system (UNIC) training
Course Availability	Please contact the appropriate WLSA training centre with the requested engine type available.

## 2-STROKE PRODUCT COURSES

- ENGINE THEORETICAL
- ENGINE OPERATION ADVANCED
- ENGINE OPERATION AND PRACTICAL ADVANCED
- ENGINE FOLLOW-UP
- TAILOR MADE COURSE



# ENGINE THEORETICAL

## COURSE OBJECTIVE

The trainees will learn the function of an electronic controlled 2-stroke engine. They get basic knowledge about engine components, hydraulic & pneumatic systems, control system, operator interface and cylinder lubrication.

## CONTENT OF THE COURSE

- Engine Design
- Engine Components & System
- Engine Control System
- Operator Interface
- Lubrication System

## PREREQUISITES

The trainees should have a basic technical maintenance and operational knowledge of 2-Stroke Engines and understand technical documents. Theoretical education on internal combustion engines is preferred.

Course Data	
<b>Target Group</b>	This training course is aimed for ship engineers and operators which need basic information about engine technologies. This training is also suitable for superintendents and fleet managers to get a global view.
<b>Duration</b>	3 working days.
<b>Course Availability</b> Courses are also available onsite.	Busan, South Korea Drunen, the Netherlands Fort Lauderdale, USA Khopoli, India Rio de Janeiro, Brazil Shanghai, China Singapore, Singapore

# ENGINE OPERATION ADVANCED

## COURSE OBJECTIVE

The trainees will learn the function of an electronic controlled 2-stroke engine. They get detailed knowledge of engine components, hydraulic & pneumatic systems, control system, operator interface and cylinder lubrication. As well the Engine Operation Advanced course contains simulator training and actual services aspects.

## CONTENT OF THE COURSE

- Engine Design
- Engine Components & System
- Engine Control System
- Engine Operator Interface
- Cylinder Lubrication System
- Engine Service & Operation
- Simulator Training

## PREREQUISITES

The trainees should have a good knowledge and operational experience of 2-Stroke Engines. Theoretical education on internal combustion engines is preferred.

### Course Data

<b>Target Group</b>	This Engine Operation Advanced training is aimed for ship engineers and operators which need detailed information about engines technologies for their daily work and operation.
<b>Duration</b>	5 working days
<b>Course Availability</b>	Busan, South Korea Drunen, the Netherlands Fort Lauderdale, USA Khopoli, India Shanghai, China Singapore, Singapore

# ENGINE OPERATION AND PRACTICAL ADVANCED

## COURSE OBJECTIVE

The trainees will learn the function of an electronic controlled 2-stroke engine. They get detailed knowledge about engine components, hydraulic & pneumatic systems, control system, operator interface and cylinder lubrication. As well the Engine Operation & Practical Advanced course contains simulator training and actual services aspects. Additionally hands on experience of selected components.

## CONTENT OF THE COURSE

- Engine Design
- Engine Components & System
- Engine Control System
- Engine Operator Interface
- Cylinder Lubrication System
- Service & Operation
- Simulator Training
- Practical training could cover following topics:  
Fuel pump; Servo oil pump; Camshaft Supply Unit; Actuator for fuel pump; Crank Angle Unit & Adjustment; Injection Control Unit (ICU); Valve control unit (VCU); CLU-4 Dosage Pump / flexLUBE Pump / CLU-5; Exhaust valve; Set-Up of Operator flexView

## PREREQUISITES

The trainees should have a good knowledge and operational experience of 2-Stroke Engines. Theoretical education on internal combustion engines is preferred.

Course Data	
Target Group	This Engine Operation & Practical Advanced training is aimed for ship engineers and operators which need detailed information about engines technologies for their daily work and operation. In this course will be additionally focused on the practical work.
Duration	5-10 working days The course could be extended by days, if more practical topics are selected.
Course Availability	Busan, South Korea Drunen, the Netherlands Fort Lauderdale, USA Khopoli, India Shanghai, China Singapore, Singapore

# ENGINE FOLLOW-UP

## COURSE OBJECTIVE

Target of the Engine Follow-up course is to deepen the knowledge of Engine technology by a repetition part, in-detail presentation of systems and components, operational aspects on the simulator and Q&A session with specialists from technical services. After this training, the trainees understand the function of an engine and its control in detail. They will be able to operate and maintain an engine in a safe and economic way.

## CONTENT OF THE COURSE

- Repetition of engine technology, related components and systems
- Deepening the engine know-how
- Technical meeting with field service specialists
- Q&A

## PREREQUISITES

The trainees should have good knowledge about maintenance and operation of an engine and understand technical documents. The trainee should have done at least one contract on board a ship with the specific engine.

Course Data	
Target Group	This Follow-up training course is aimed for ship engineers and operators with onboard engine experiences.
Duration	4 - 5 working days
Course Availability	Busan, South Korea Drunen, the Netherlands Fort Lauderdale, USA Shanghai, China

# TAILOR-MADE COURSE ACCORDING TO CUSTOMER NEEDS

## COURSE OBJECTIVE

Target of the Tailor-made course is to create a training solution that fits 100% customer real needs, installation and/or fleet. No time used on well known subjects, content will be dedicated to deepen the knowledge of Engine technology, in-detail presentation of systems and components and operational aspects on the simulator.

Optimized time for learning to make trainees competent to operate and maintain engines in a safe and economic way.

## CONTENT OF THE COURSE

- Course content can be a remix of the Learning Objectives of standard courses (e.g. focusing more on specific topics)
- New Learning Objectives can be included according to customer needs

## PREREQUISITES

Those can vary based on the defined content of the course.

### Course Data

To create the course together with WLSA, please contact our 2-Stroke Training Development Centres:

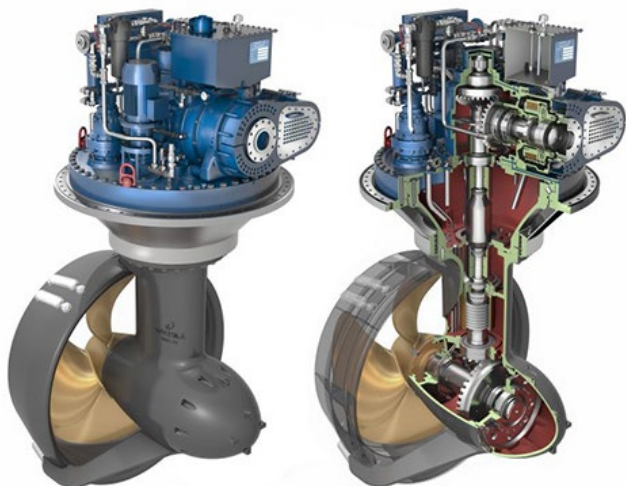
[Training.Busan@wartsila.com](mailto:Training.Busan@wartsila.com)

[Training.Drunen@wartsila.com](mailto:Training.Drunen@wartsila.com)

[Training.fortlauderdale@wartsila.com](mailto:Training.fortlauderdale@wartsila.com)

## WÄRTSILÄ PRODUCT COURSES (PROPULSION)

- WÄRTSILÄ CONTROLLABLE PITCH PROPELLER
- WÄRTSILÄ STEERABLE THRUSTER
- WÄRTSILÄ TRANSVERSE THRUSTER
- WÄRTSILÄ WATERJET
- WÄRTSILÄ PROPULSION CONTROL SYSTEM, RETROFIT





# WÄRTSILÄ CONTROLLABLE PITCH PROPELLER

## COURSE OBJECTIVE

To obtain an understanding of controllable pitch propeller mechanical and hydraulic engineering and control systems to be able to carry out troubleshooting and make basic adjustments.

## CONTENT OF THE COURSE

- Main system components
- Basic controllable pitch propeller knowledge
- Mechanical layout and design
- Maintenance and operation
- Hydraulic system
- Gear boxes (Wärtsilä models if applicable)
- Explanation of the system based on the software block diagram
- Practical training on mechanical, hydraulics and the control system
- Troubleshooting
- Hardware handling

## PREREQUISITES

The trainees should have an educational background in marine engineering and operational experience with ship propulsion.

Course Data	
Target Group	The controllable pitch propeller course is designed for ship engineers and electricians.
Duration	4 working days (5 working days incl. Gearbox)
Course Availability	Drunen, the Netherlands Onboard

# WÄRTSILÄ STEERABLE THRUSTER

## COURSE OBJECTIVE

To obtain an understanding of steerable thruster mechanical and hydraulic engineering and control systems to be able to carry out troubleshooting and make basic adjustments.

## CONTENT OF THE COURSE

- Main system components
- Basic steerable thruster knowledge
- Mechanical layout and design
- Maintenance and operation
- Hydraulic system
- Explanation of the system based on the software block diagram
- Practical training with the control system
- Troubleshooting
- Hardware handling

## PREREQUISITES

The trainees should have an educational background in marine engineering and operational experience with ship propulsion.

Course Data	
Target Group	The steerable thrusters course is designed for ship engineers and electricians.
Duration	4 working days
Course Availability	Drunen, the Netherlands Onboard

# WÄRTSILÄ TRANSVERSE THRUSTER

## COURSE OBJECTIVE

To obtain an understanding of transverse thruster mechanical and hydraulic engineering and control systems to be able to carry out troubleshooting and make basic adjustments.

## CONTENT OF THE COURSE

- Main system components
- Basic transverse thruster knowledge
- Mechanical layout and design
- Hydraulic system
- Explanation of the control system
- Practical training with the control system
- Troubleshooting

## PREREQUISITES

The trainees should have an educational background in marine engineering and operational experience with ship propulsion.

Course Data	
Target Group	The transverse thrusters course is designed for ship engineers and electricians.
Duration	1 working day
Course Availability	Drunen, the Netherlands Onboard

# WÄRTSILÄ WATERJET

## COURSE OBJECTIVE

To obtain an understanding of waterjet mechanical and hydraulic engineering and control systems to be able to carry out troubleshooting and make basic adjustments.

## CONTENT OF THE COURSE

- Main components
- Basic waterjet knowledge
- Mechanical layout and design
- Hydraulic and lubrication system
- Explanation of the control system
- Practical training on mechanical, hydraulics and the control system
- Troubleshooting

## PREREQUISITES

The trainees should have an educational background in marine engineering and operational experience with ship propulsion.

Course Data	
Target Group	The waterjet course is designed for ship engineers and electricians.
Duration	3 working days
Course Availability	Drunen, the Netherlands Onboard

# WÄRTSILÄ PROPULSION CONTROL SYSTEM, RETROFIT

## COURSE OBJECTIVE

After this training course, the trainees are able to understand the 'new' control system after a retrofit and make some basic adjustments, as well as set up trends (monitoring) in the 'new' system.

## CONTENT OF THE COURSE

- Main control system components
- Basic controllable pitch propeller knowledge
- Software element description
- Explanation of the system based on the block diagram
- Practical training in simulated environment
- Practical training with the control system
- Monitoring
- Hardware handling

## PREREQUISITES

The trainees should have an educational background in marine engineering and operational experience with ship propulsion.

Course Data	
Target Group	The Propulsion control system course is designed for ship engineers and electricians.
Duration	2 working days
Course Availability	Drunen, the Netherlands Onboard

## WÄRTSILÄ PRODUCT COURSES (ENGINE AUTOMATION)

- WÄRTSILÄ ENGINE CONTROL, INSTRUMENTATION AND AUTOMATION SYSTEMS COURSE



# WÄRTSILÄ ENGINE CONTROL, INSTRUMENTATION AND AUTOMATION SYSTEMS

## COURSE OBJECTIVE

Upon completing the course, the trainees shall be able to efficiently understand the working principles and operational functions of automation and electrical systems in the engine room, enabling them to operate the engines and auxiliaries in a safer, more efficient and effective way.

## CONTENT OF THE COURSE

Special focus is placed on the economical aspects of engine room operation and utilization. The trainee will receive thorough familiarization with procedures concerning the operation and function of the most common maintenance work on the respective engine electrical and automation systems and planning of the efficient maintenance. The course will give trainees a detailed, theoretical introduction in Wärtsilä engine technology. Hands-on training will be performed on important parts. The trainees will receive information for modifications on hardware and service aspects (mechanical- and electrical problems).

- Engine type specific Automation and Control System design and functionality
- Software applications applicable to specific engine type selected
- Engine type specific Major Alarm and Safety System
- Engine operation and efficiency criteria
- System Component operation
- Emergency situations & Fault resolution
- Assessment

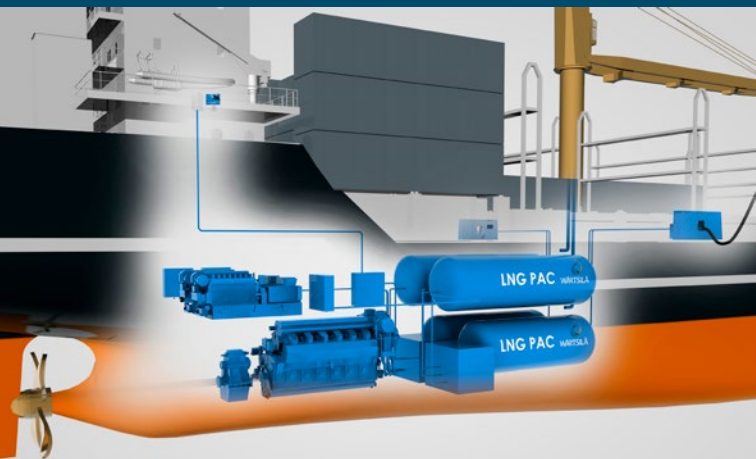
## PREREQUISITES

The trainees should have a basic knowledge of marine engine systems together with some operational experience of the engine type requested for the training program. Formal theoretical education in a mechanical or electrical engineering vocation is preferred but is not mandatory.

Course Data	
Target Group	This training course is aimed for marine and power plant personnel who are directly or indirectly responsible for the efficient operation of Wärtsilä engines and related systems.
Duration	2 - 5 working days
Course Availability	
Busan, South Korea	WECS 8000, UNIC C1, C2 and C3
Drunen, the Netherlands	UNIC C2 and C3
Fort Lauderdale, USA	UNIC C1, C2 and C3
Jakarta, Indonesia	UNIC C1, C2 and C3
Rio de Janeiro, Brazil	UNIC C1, C2 and C3, WECS 3000
Trieste, Italy	WECS 2000, UNIC C1, C2 and C3
Turku, Finland	WECS 7500, WECS 8000, UNIC C1, C2, C3

## WÄRTSILÄ PRODUCT COURSES (ENVIRONMENTAL)

- WÄRTSILÄ NO<sub>x</sub> REDUCER (NOR) OPERATION
- WÄRTSILÄ SCRUBBER OPERATION
- LNGPAC OPERATION ADVANCED





# WÄRTSILÄ NO<sub>x</sub> REDUCER (NOR) OPERATION

## COURSE OBJECTIVE

After the course the trainees have excessive knowledge about the NO<sub>x</sub> reducers. They will get acquainted with the rules and legislation regulating NO<sub>x</sub> emissions. They know the basics of NO<sub>x</sub> reducer chemistry, understand the design and function of the system. They are able to carry out the operation and service routines of the unit and its related systems in a safe way.

## CONTENT OF THE COURSE

- Legislation and regulations overview
- Work safety
- Design and function of the system and its components
- Operating conditions and limitations
- Chemical requirements
- Service and maintenance

## PREREQUISITES

Theoretical education on engineering and some operational experience of the marine or power plant installation is preferred.

Course Data	
Target Group	Wärtsilä NO <sub>x</sub> reducers (NOR) operation course is aimed for the ship or power plant support, operation or management level of engineering staff.
Duration	1 working day
Course Availability	Turku, Finland

# WÄRTSILÄ SCRUBBER OPERATION

## COURSE OBJECTIVE

After the course the trainees have excessive knowledge about the Wärtsilä Scrubber. They will get acquainted with the rules and legislation regulating SO<sub>x</sub> emissions and the abatement systems. They know the basics of SO<sub>x</sub> reducer chemistry, understand the design and function of the scrubber system. They are able to carry out the operation and service routines of the unit and its related systems in a safe way.

Specific content of the course is tailored based on type of the scrubber in question.

## CONTENT OF THE COURSE

- Legislation and regulations overview
- Work safety
- Design and function of the system and its components
- Operating conditions and limitations
- Chemical requirements
- Service and maintenance

## PREREQUISITES

The trainees should have a suitable technical education and basic knowledge of SO<sub>x</sub> reduction principles.

Course Data	
Target Group	Wärtsilä Scrubber operation course is aimed for the ship support, operation and management level engineering staff.
Duration	3 working days
Course Availability	Busan, Korea Drunen, the Netherlands

# LNGPac™ OPERATION ADVANCED

## COURSE OBJECTIVE

The trainees will understand the design and operation and of LNGPac™. They will understand the gas and LNG safety aspects and the control philosophy of the application.

## CONTENT OF THE COURSE

- Gas properties and safety
- Environmental legislation
- Dual Fuel engine technology
- Design and function of LNGPac™
- Start, stop and operation of LNGPac™
- Control and Automation of LNGPac™
- Control procedures
- Maintenance of LNGPac™

## PREREQUISITES

The trainees should have a basic knowledge and operational experience of large medium speed engines as well as ship's engine, electrical & automation and auxiliary systems. The trainees should have valid certification of Basic Safety Training (BST) including Basic Firefighting, Personal Survival, Personal Safety and Social Responsibility, and Elementary First Aid according to the requirements of the Standards of Training, Certification & Watchkeeping (STCW) 95 Code.

Course Data	
Target Group	This training course is aimed for ship crew with Wärtsilä liquefied gas applications on board at the operational and management levels.
Duration	2-3 days
Course Availability	Ft. Lauderdale, USA Trieste, Italy Turku, Finland Onsite Onboard with limited hands-on

## SAFETY COURSES

- MARINE GAS SAFETY



# MARINE GAS SAFETY

## COURSE OBJECTIVE

The trainees will be able to understand the gas and LNG properties and safety aspects along with an introduction of related equipment and systems.

## CONTENT OF THE COURSE

- Liquefied Natural Gas (LNG)
- Requirement and Treatment of Fuel Gas
- General Health and Safety Aspects of Gas and LNG
- General rules and procedures
- General design of Wärtsilä LNGPac™
- Safety and protection systems
- LNGPac™ Operation principles

## PREREQUISITES

Principles together with some knowledge and operational experience of installation's engine, electrical & automation and auxiliary systems.

The trainees from onboard should have valid certification of Basic Safety Training (BST) including Basic Fire fighting, Personal Survival, Personal Safety and Social Responsibility, and Elementary First Aid according to the requirements of the Standards of Training, Certification & Watchkeeping (STCW) 95 Code.

Course Data	
Target Group	Marine Gas Safety training course is aimed for any personnel who are involved with Wärtsilä gas applications on board at the Operational and Management levels.
Duration	1 working day
Course Availability	Drunen, the Netherlands Rio de Janeiro, Brazil Turku, Finland Onsite

## ENGINEERING COURSES

- SHIP, ENGINE AND PROPULSION KNOWLEDGE BASIC
- ENGINE ROOM AUXILIARY SYSTEMS OPERATION
- ENGINE PERFORMANCE COURSE



# SHIP, ENGINE AND PROPULSION KNOWLEDGE BASIC

## COURSE OBJECTIVE

The objective of this training is to obtain a basic understanding of engine and ship propulsion technology and applications and a basic understanding of the Wärtsilä concepts regarding propulsion products.

## CONTENT OF THE COURSE

- Orientation on Wärtsilä propulsion concepts
- Basic propulsion knowledge
- Orientation on market segments and propulsion applications
- General product overview of;
  - Wärtsilä Fixed Pitch Propeller
  - Wärtsilä Controllable Pitch Propeller
  - Wärtsilä Transverse Thruster
  - Wärtsilä Steerable Thruster
  - Wärtsilä Waterjet
  - Wärtsilä Gearbox
  - Wärtsilä Seals and Bearings
  - Wärtsilä 2-stroke and 4-stroke engines

## PREREQUISITES

No specific requirement.

Course Data	
Target Group	The Ship, Engine and Propulsion knowledge course is intended for customers who have a professional interest in Ship, Engine and Propulsion Systems.
Duration	2 working days
Course Availability	Drunen, the Netherlands Onsite

# ENGINE ROOM AUXILIARY SYSTEMS OPERATION

## COURSE OBJECTIVE

In order to upkeep a safe and reliable operation, understanding the auxiliary systems is essential. During the course, the trainees will understand the basics of the engine hall's or ship's engine room auxiliary systems' design, operation maintenance.

## CONTENT OF THE COURSE

- Design and function of auxiliary systems and main components:
  - Fuel systems (HFO, LFO, DF, GAS)
  - Lubricating oil system
  - Cooling water system
  - Compressed air system
  - Charge air system
  - Exhaust gas system
- Basic introduction
  - Automation and electrification systems
  - Environmental systems
- Fuel, lubricating oil and cooling water requirements and treatments
- Simulator training and exercises

## PREREQUISITES

The trainees should have a basic knowledge of engine room or power plant auxiliary principles together with some operational experience of diesel engines. Theoretical education on internal combustion engines is preferred.

Course Data	
Target Group	This training course is aimed for marine and power plant personnel at the operational and management levels.
Duration	5 working days
Course Availability	Rio de Janeiro, Brazil Turku, Finland



# ENGINE PERFORMANCE COURSE

## COURSE OBJECTIVE

This course provides extensive guided simulator training in monitoring and evaluation of engine performance and engine room operation. Also EPC course provides the engineer with a wide range of operational tasks to supplement and strengthen practical knowledge already acquired and to provide training in investigative techniques to facilitate fault finding onboard.

## CONTENT OF THE COURSE

- Familiarization
- Plant arrangement
- Instrumentation
- Controls
- Operational procedures
- Performance evaluation of main engine parameters
- Performance evaluation of auxiliary systems parameters
- Trouble shooting
- Maintain a safe and efficient engineering operation parameters

## PREREQUISITES

The trainees should have a qualification that has enabled the trainee to have gained experience as an engineer responsible at Operational level.

Course Data	
Target Group	Engine Performance Course (EPC) is intended for Engineering Officers both at Management and Operational level.
Duration	5 working days
Course Availability	Drunen, the Netherlands Jakarta, Indonesia Rio de Janeiro, Brazil Turku, Finland

## CONTROL, AUTOMATION AND ELECTRICAL COURSES

- ELECTROTECHNICS, SENSORS AND ENGINE AUTOMATION INTRODUCTION
- AUTOMATION, INSTRUMENTATION AND SENSOR TECHNIQUE PRACTICAL
- VESSEL AUTOMATION, IAS & PMS, POWER DISTRIBUTION AND VARIABLE SPEED DRIVERS
- VESSEL AUTOMATION, IAS & PMS
- WÄRTSILÄ DYNAMIC POSITIONING (DP) OPERATION
- ECDIS - TYPE SPECIFIC
- INTEGRATED NAVIGATION SYSTEM
- AUTOMATION PCS/MCS
- AUTOMATION HV - POWER AND PROPULSION
- NACOS MAINTENANCE
- VALMATIC PLATINUM AUTOMATION SYSTEM (IACMS) + POWER MANAGEMENT SYSTEM (PMS)
- WÄRTSILÄ APSS PRODUCTS (WAPSS)
- VALMATIC PLATINUM AUTOMATION SYSTEM (IACMS) + WÄRTSILÄ APSS PRODUCTS (WAPSS) + WÄRTSILÄ ENGINE CONTROL, INSTRUMENTATION AND AUTOMATION SYSTEM (WECS/UNIC)



# ELECTROTECHNICS, SENSORS AND ENGINE AUTOMATION INTRODUCTION

## COURSE OBJECTIVE

To provide the trainees with some basic electrical, fault finding and engine automation knowledge so they can support the staff with greater understanding.  
They can solve/diagnose simple electrical problems.

## CONTENT OF THE COURSE

- Introduction to electrotechnics and electronics basic concepts
- Electronic components
- Electrical measurements and tools
- Sensor types
- Electrical drawings
- Testing and fault finding
- Introduction to Wartsila Engine Automation systems (Spemos, WECS, UNIC, Control Systems)

## PREREQUISITES

The trainees should have some basic knowledge of engine operations.

Course Data	
Target Group	This basic course is aimed at ships staff, primarily for non-officers and office staff, who need a better understanding of electrical engineering and automation so they can better understand what is happening on the engines.
Duration	3 working days
Course Availability	Trieste, Italy

# AUTOMATION, INSTRUMENTATION AND SENSOR TECHNIQUE PRACTICAL

## COURSE OBJECTIVE

To provide the trainees with some basic electrical knowledge and fault finding skills so they can support the staff onboard the vessel with greater understanding of what is happening in particular situations. They can solve/diagnose small electrical problems, therefore keeping shore assisted maintenance costs down.

## CONTENT OF THE COURSE

- Basic electrical theory (AC & DC)
- Electrical safety
- Electrical measurement techniques
- Sensor types (introduction different sensor types, their implementation PT100, thermocouple, magnetic pickups, proximity switch and pressure transmitters)
- Electrical equipment, fault finding techniques
- Insulation test theory (importance onboard the vessel)
- Automation equipment theory (Kongsberg and Lyngsoe)
- Starter panel training (practical)

## PREREQUISITES

The trainees should have some basic knowledge of ship operations.

Course Data	
Target Group	This basic course is aimed at ships staff. Primarily for non officers, office staff (Coordinators, Buyers) who need a better understanding of electrical engineering and Automation so they can understand better what is happening onboard the vessel.
Duration	3-5 working days
Course Availability	Busan, South Korea Rio de Janeiro, Brazil Jakarta, Indonesia



# VESSEL AUTOMATION, IAS & PMS, POWER DISTRIBUTION AND VARIABLE SPEED DRIVES

## COURSE OBJECTIVE

After this training course the trainees are able to explain the working principles and operational functions of the Integrated Automation System (IAS), the Power Management System (PMS), Power Distribution (PD) and the Variable Speed Drives (VSD) on board.

## CONTENT OF THE COURSE

- Integrated Automation System (IAS): Principles and Features
- Power Management System (PMS): Principles and Features
- Power Distribution: Principles and Features
- Variable Speed Drive (VSD): Principles and Features
- Hands-on (on board only)

## PREREQUISITES

The trainees should have a basic knowledge of marine electrical design together with some operational experience. Theoretical education on electrical engineering is preferred.

Course Data	
Target Group	This training course is aimed at marine personnel using Wärtsilä Electrical and Automation equipment.
Duration	4 days only theoretical, 5 days with hands-on included
Course Availability	Drunen, the Netherlands (theoretical only) Onboard (incl. hands-on)

# VESSEL AUTOMATION, IAS & PMS

## COURSE OBJECTIVE

After this training course the trainees are able to explain the working principles and operational functions of the Integrated Automation System (IAS), the Power Management System (PMS) on board.

## CONTENT OF THE COURSE

- Integrated Automation System (IAS): Principles and Features
- Power Management System (PMS): Principles and Features
- Hands-on (on board only)

## PREREQUISITES

The trainees should have a basic knowledge of marine electrical design together with some operational experience. Theoretical education on electrical engineering is preferred.

Course Data	
Target Group	This training course is aimed at marine personnel using Wärtsilä Electrical and Automation equipment.
Duration	2 days only theoretical, 3 days with hands-on included
Course Availability	Drunen, the Netherlands (theoretical only) Onboard (incl. hands-on)

# WÄRTSILÄ DYNAMIC POSITIONING (DP) OPERATION

## COURSE OBJECTIVE

- After this course the trainees are able to explain the working principles and operational functions of the Wärtsilä DP Systems. Practical exercises are done using a DP simulator

## CONTENT OF THE COURSE

- Introduction to the Wärtsilä Dynamic Positioning (DP) system
- DP system overview, hardware and software main function block
- DP Operation in theory: what is behind the buttons
- DP Operation in practice using the DP Simulator
  
- The DP simulator focuses on DP operations and does not expand into vessel dynamics.

## PREREQUISITES

- The trainees should have a basic knowledge of marine electrical design together with some operational experience in DP operations.

Course Data	
Target Group	This training course is aimed at marine personnel using Wärtsilä Dynamic Positioning equipment.
Duration	2-3 working days
Course Availability	Drunen, the Netherlands Onboard



# ECDIS - TYPE SPECIFIC

## CHARTPILOT ALL VERSIONS

### ECDISPILOT PLATINUM

#### COURSE OBJECTIVE

- EDCIS definition and legal status
- ECDIS vocabulary
- Chart-Maintenance
- ECDIS Monitoring
- ECDIS Planning

#### CONTENT OF THE COURSE

- Fundamentals of ECDIS & ENC's ( Generic Refreshment )
- Description of the Human Machine Interface
- Chart Maintenance
- Basic Display Handling
- Set up of the ENC Presentation
- Navigational Sensor Management & Monitoring
- Voyage Planning
- Voyage & Alert Monitoring
- Navigational Tools
- Backup & Restore of Routes and User Objects
- system own additional functions in the ECDIS

#### PREREQUISITES

- Holder of CoC as Navigator
- Nautical education
- English language

Course Data	
Target Group	Officer on Nautical watch Nautical inspectors Authorities e.g. Port State Control WSAM employees
Duration	2 working days
Course Availability	Rio de Janeiro, Brazil Wärtsilä SAM Electronics GmbH, Hamburg Ashore Onboard Online
Contact for more info	<a href="mailto:SAMElectronicsTraining@wartsila.com">SAMElectronicsTraining@wartsila.com</a>

# INTEGRATED NAVIGATION SYSTEM

## NACOS XX-4, NACOS XX-5, NACOS PLATINUM

### COURSE OBJECTIVE

- Definition of IBS/INS
- Principle task of IBS/INS
- Integration of tasks in workstations
- Familiarization with SAM - INS components
- Use of IBS/INS in exercises
- Radarplot principle and practical use
- EDCIS definition and legal status
- ECDIS vocabulary
- Chart-Maintenance
- ECDIS Monitoring
- ECDIS Planning
- the practical use of Trackplot
- the practical use of Speedpilot

### CONTENT OF THE COURSE

- Radarplot Video function
- Target treatment and alarm function
- Chartdata in Radar, synthetic information on PPI
- Fundamentals of ECDIS & ENC's ( Generic Refreshment )
- Description of the Human Machine Interface
- Chart Maintenance
- Basic Display Handling
- Set up of the ENC Presentation
- Navigational Sensor Management & Monitoring
- Voyage Planning
- Voyage & Alert Monitoring
- Navigational Tools
- Backup & Restore of Routes and User Objects
- system own additional functions in the ECDIS
- Autopilot function Heading Mode and Course Mode
- Track Control System Track Mode
- Practical use of Trackplot, usefull hints
- Operational modes of Speedpilot
- Practical use of Speedpilot, usefull hints

### PREREQUISITES

- Holder of CoC as Navigator
- Similar Nautical education
- English language

Course Data	
Target Group	Officer on Nautical watch Nautical inspectors Authorities' surveyer
Duration	Tailored duration 3-5 working days
Course Availability	Rio de Janeiro, Brazil Wärtsilä SAM Electronics GmbH, Hamburg Ashore Onboard Online
Contact for more info	SAMElectronicsTraining@wartsila.com

# AUTOMATION PCS/MCS

## COURSE OBJECTIVE

- Propulsion Control with PCS/MCS 2200
- Propulsion Control with NACOS Platinum
- general Structure
- Normal operation check up
- Maintenance with help of operators"

## CONTENT OF THE COURSE

- System philosophy of Propulsion Control System PCS 2200 with
- Engine manoeuvring System EMS 2200/BMS2200
- Engine Protection System EPS 2200
- fault finding for user with change of modules
- NACOS Platinum integration and operation

## PREREQUISITES

- Holder of CoC for Ship's engine operation
- Similar technical profession
- English language

Course Data	
Target Group	Technical Officer Electrical Officer Authorities' surveyer Technical inspectors
Duration	2 working days
Course Availability	Wärtsilä SAM Electronics GmbH, Hamburg Onboard
Contact for more info	<a href="mailto:SAMElectronicsTraining@wartsila.com">SAMElectronicsTraining@wartsila.com</a>

# AUTOMATION HV - POWER AND PROPULSION

## COURSE OBJECTIVE

- Tailored course for each project
- High Voltage Power and Propulsion System
- Main Propulsion System
- Thruster Drive System
- Operation of each sub component

## CONTENT OF THE COURSE

- Network Philosophy
- Operation of Power Management System (PMS)
- Generator Protection Modules (GPM500)
- Ship's Project Specific Layout
- Shore Connection
- Grounding and Short Circuiting
- Maintenance
- Main Propulsion System components
- Thruster Drive System

## PREREQUISITES

- Electrotechnical profession or education
- English language

Course Data	
Target Group	Electrotechnical engineer Skilled ship's electrician
Duration	tailored duration 2-5 working days
Course Availability	Wärtsilä SAM Electronics GmbH, Hamburg Onboard
Contact for more info	<a href="mailto:SAMElectronicsTraining@wartsila.com">SAMElectronicsTraining@wartsila.com</a>

# NACOS MAINTENANCE

## NACOS XX-4, NACOS XX-5, NACOS PLATINUM

### COURSE OBJECTIVE

- INS idea and technical realization NACOS
- Main components
- The NACOS Network
- Functions and Check - up
- Maintenance at workstations

### CONTENT OF THE COURSE

- NACOS Introduction
- system compointes and compability
- possible configurations
- RADAR-application with all components
- ECDIS application with all components

### PREREQUISITES

Electrotechnical profession or education  
English language

Course Data	
Target Group	Electrotechnical engineer Skilled ship's electrician IT officer
Duration	3 working days
Course Availability	Wärtsilä SAM Electronics GmbH, Hamburg
Contact for more info	SAMElectronicsTraining@wartsila.com

# VALMATIC PLATINUM AUTOMATION SYSTEM (IACMS) + POWER MANAGEMENT SYSTEM (PMS)

## COURSE OBJECTIVE

After this training course the trainees will be able to:

- Understand the working principles and the operational functions of the Valmatic Platinum Integrated Automation Monitoring Control System.
- Understand the working principles and operational functions of the Valmatic Platinum Power Management System.
- Solve/diagnose field electrical problems.
- Maintain / restore the system.
- Apply a systematic approach to fault finding.

## CONTENT OF THE COURSE

- Automation components basic explanation and their applications.
- Sensor types introduction and their implementation (PT100, thermocouple, pressure transmitters, ecc...).
- Electrical measurement / fault finding techniques.
- Automation components explanation and their applications.
- Automation components replacement / programming / restoring.
- Automation software basic / automatic functions.
- Power Management System principles and features.
- Hands-On exercises (simulator in training centre or on customer's premises).

## PREREQUISITES

The trainees should have a basic knowledge of marine electrical design together with some operational experience.

Course Data	
Target Group	This training course is aimed at marine personnel using Wärtsilä Valmatic Platinum Automation equipment.
Duration	3-4 working days
Course Availability	Diano d'Alba, Italy and Onboard. Trieste, Italy (Upon Availability).
Contact for more info	<a href="mailto:training.apss.it@wartsila.com">training.apss.it@wartsila.com</a>

# WÄRTSILÄ APSS PRODUCTS (WAPSS)

## COURSE OBJECTIVE

After this training course the trainees will be able to:

- Understand the working principles and the operational functions of the Wärtsilä Apss Products.
- Maintain / restore the system.
- Apply a systematic approach to fault finding.

## CONTENT OF THE COURSE

- Wärtsilä Apss products introduction.
- Smart-Level system explanation and applications / Maintenance.
- Smart-VCU system explanation and applications / Maintenance.
- Smart-MCU system explanation and applications / Maintenance.
- X-COM system explanation and applications / Maintenance.
- Alopex system explanation and applications / Maintenance.
- Smart-Traffic light system explanation and applications / Maintenance.
- ST-PC tool explanation and applications.
- Hands-On exercises (simulator in training centre or on customer's premises).

## PREREQUISITES

The trainees should have a basic technical knowledge.

Course Data	
Target Group	This training course is aimed at marine personnel using Wärtsilä APSS equipment.
Duration	1-2 working days
Course Availability	Diano d'Alba, Italy and Onboard. Trieste, Italy (Upon Availability).
Contact for more info	<a href="mailto:training.apss.it@wartsila.com">training.apss.it@wartsila.com</a>

# VALMATIC PLATINUM AUTOMATION SYSTEM (IACMS) + WÄRTSILÄ APSS PRODUCTS (WAPSS) + WÄRTSILÄ ENGINE CONTROL, INSTRUMENTATION AND AUTOMATION SYSTEM (WECS/UNIC)

## COURSE OBJECTIVE

After this training course the trainees will be able to:

- Understand the working principles and the operational functions of the Valmatic Platinum Integrated Automation Monitoring Control System.
- Understand the working principles and the operational functions of the Wärtsilä Apss Products.
- Efficiently understand the working principles and operational functions of engine automation and electrical systems, this will enable them to operate the engines and auxiliaries in a safer, more efficient and effective way.
- Solve/diagnose field electrical problems.
- Maintain / restore the system.
- Apply a systematic approach to fault finding.

## CONTENT OF THE COURSE

- Automation components basic explanation and their applications.
- Sensor types introduction and their implementation (PT100, thermocouple, pressure transmitters, ecc...).
- Electrical measurement / fault finding techniques.
- Automation components explanation and their applications.
- Automation components replacement / programming / restoring.
- Automation software basic / automatic functions.
- Power Management System principles and features.
- Wärtsilä Apss products introduction.
- Smart-Level system explanation and applications / Maintenance.
- Smart-VCU system explanation and applications / Maintenance.
- Smart-MCU system explanation and applications / Maintenance.
- X-COM system explanation and applications / Maintenance.
- Alopex system explanation and applications / Maintenance.
- Smart-Traffic light system explanation and applications / Maintenance.
- ST-PC tool explanation and applications.
- Engine type specific Automation and Control System design and functionality.
- Software applications applicable to specific engine type selected.
- Engine type specific Major Alarm and Safety System.
- Engine operation and efficiency criteria.
- System Component operation.
- Emergency situations & Fault resolution.
- Assessment.
- Hands-On exercises (simulator in training centre or on customer's premises).



## PREREQUISITES

The trainees should have a basic knowledge of marine engine systems together with some operational experience of the engine type requested for the training program. Formal theoretical education in a mechanical or electrical engineering vocation is preferred but is not mandatory.

Course Data	
Target Group	This training course is aimed at marine personnel who are directly or indirectly responsible for the efficient operation of Wärtsilä products and related systems.
Duration	5-6 working days
Course Availability	Diano d'Alba, Italy and Onboard. Trieste, Italy (Upon Availability).
Contact for more info	<a href="mailto:training.apss.it@wartsila.com">training.apss.it@wartsila.com</a>

## POWER PLANT TRAINING COURSE

- POWER PLANT INTRODUCTION TRAINING COURSE
- POWER PLANT ELECTRIFICATION TRAINING COURSE
- POWER PLANT MANAGEMENT TRAINING COURSE
- POWER PLANT OPERATION AND MAINTENANCE ONSITE TRAINING COURSE



# POWER PLANT INTRODUCTION TRAINING COURSE

## COURSE OBJECTIVE

The purpose of this training is to familiarise operators and middle management with the design features of the entire power plant, routines and strategies for operation, and maintenance of the power plant.

## CONTENT OF THE COURSE

- Plant general arrangements
- Plant operation routines
- Fuel, lube oil and water quality
- Auxiliary systems operation instructions
- Installation documentation system, power plants
- Power plant supervision routines, instructions
- Engine care
- Electrification
- Plant overall alarm system
- Condition Based Maintenance (CBM)
- Creating a staff training plan
- Spare part handling and delivery
- Exchange and safety parts

## PREREQUISITES

The trainees should have a basic knowledge of diesel engine principles together with some operational experience of the diesel engines. Theoretical education on internal combustion engines is preferred.

Course Data	
Target Group	Power plant introduction course is aimed for middle management and operators.
Duration	5 working days
Course Availability	Busan, South Korea Fort Lauderdale, USA Jakarta, Indonesia Khopoli, India Rio de Janeiro, Brazil Trieste, Italy Turku, Finland Onsite

# POWER PLANT ELECTRIFICATION TRAINING COURSE

## COURSE OBJECTIVE

The trainees are able to understand the working principles and operational function of each electrical system in the power plant, thus enabling them to operate the plant in a safe and effective way.

## CONTENT OF THE COURSE

- Electrification
- Operation modes
- Speed monitoring system
- Engine instrumentation
- Electronic engine controller
- Alternator
- Automatic voltage regulator
- Control and monitoring system
- Operator station program
- MV / LV switchgear
- DC system, local control panels
- Protection relays

## PREREQUISITES

The trainees should have a basic knowledge of diesel power plant electrical design together with some operational experience. Theoretical education on electrical engineering is preferred.

Course Data	
Target Group	Power plant electrification course is aimed for power plant management and operators.
Duration	5 working days
Course Availability	Busan, South Korea Fort Lauderdale, USA Jakarta, Indonesia Khopoli, India Rio de Janeiro, Brazil Trieste, Italy Turku, Finland Onsite

# POWER PLANT MANAGEMENT TRAINING COURSE

## COURSE OBJECTIVE

During this training, the trainer together with the management team, plans the operation and maintenance routines. This training also emphasises economic aspects of plant operation and maintenance. Key figures for reporting plant performance are also considered.

## CONTENT OF THE COURSE

- Plant general arrangements
- Plant operation routines
- Management reporting
- Fuel and lube oil management
- Factors affecting economical operation
- Principles of preventive maintenance
- Diesel power plant coding system
- Auxiliary System design aspects
- Reliability centred maintenance
- Maintenance and operation planning
- Power plant logistics and forecasting

## PREREQUISITES

The trainees should preferably have a BSc education in engineering, (mechanical or electrical), or marine engineer together with operational experience of the diesel engines in different applications, or similar.

Course Data	
Target Group	The power plant management training course is aimed for power plant senior or middle management.
Duration	5 working days
Course Availability	Fort Lauderdale, USA Jakarta, Indonesia Khopoli, India Rio de Janeiro, Brazil Turku, Finland Onsite

# POWER PLANT OPERATION AND MAINTENANCE ONSITE TRAINING COURSE

## COURSE OBJECTIVE

The trainees will be able to maintain the engine in safer way and operate all auxiliary units, synchronise and adjust the load on the DG-sets according to grid demand, and, carry out load sharing and shedding. They will learn the fundamentals to carry out the most common maintenance work and maintenance planning.

## CONTENT OF THE COURSE

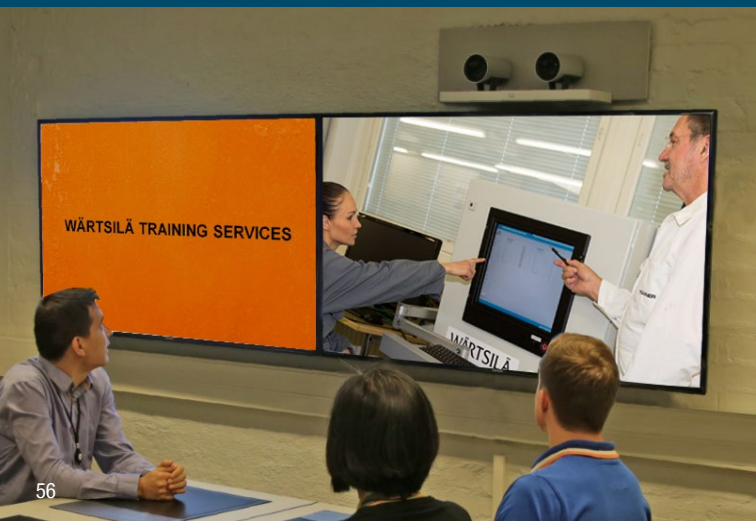
- Plant general arrangement
- Plant operation routines
- Design and function
- Function of built-on engine systems
- Heavy fuel oil quality and treatment
- Lube oil quality requirements and analyzes
- Water quality requirements and analyzes
- Engine maintenance schedule
- Engine start, stop and operation
- Engine care & Evaluation of engine operating data
- Engine condition check & Reading flow diagrams
- Auxiliary systems operation instructions
- Speed governing principles
- Fuel injection equipment, Function and overhaul
- Maintenance operations
- Installation documentation system, Power plants
- Plant operating instructions & Familiarizing with the aux. system

Course Data	
Target Group	Operation and maintenance course is aimed for power plant maintenance engineers, operators and middle management.
Duration	10 working days
Course Availability	Busan, South Korea Fort Lauderdale, USA Jakarta, Indonesia Khopoli, India Rio de Janeiro, Brazil Trieste, Italy Turku, Finland Onsite



## ADDITIONAL SERVICES

- WÄRTSILÄ LAND & SEA ACADEMY COMPETENCE MANAGEMENT SERVICE (WCMS)





## WÄRTSILÄ LAND & SEA ACADEMY COMPETENCE MANAGEMENT SERVICE (WCMS)

WCMS works to develop the competence and effectiveness of marine and energy sector employees. Through its Training Services facilities, WCMS assesses the employees' abilities, and creates a scheduled and dedicated training plan in alignment with your company's specific goals and strategy. The competence and learning progress is continuously monitored and reported.

By prior agreement regarding competence mapping, passing and final target levels, the Learning Management System service determines the necessary program with minimal need for customer co-ordination. Online, periodic reports for follow-up are also included.

### COMPETENCE MANAGEMENT

The Wärtsilä Land & Sea Academy offers specialized services focusing on career and competence management systems, assessment, and trainee programmes to meet the individual needs of ship owners and power plant operators.

Our trainee programmes are designed to satisfy the future competence needs of your business. They are individually tailored to the required skill levels, and to the operational requirements of your industry.

LET US BE PART OF YOUR COMPETENCE MANAGEMENT DEVELOPMENT



## GLOBAL CONTACT INFORMATION

To find out more about our training solutions you may contact:

- Your nearest Wärtsilä Training Centre
- [info.training@wartsila.com](mailto:info.training@wartsila.com)
- [wlsa.wartsila.com](http://wlsa.wartsila.com)

## TRAINING CENTRES

### USA

Fort Lauderdale Training Centre  
2900 S.W. 42nd Street  
Ft. Lauderdale, FL 33312  
Telephone: +1 954-327-4884  
E-mail: [training.fortlauderdale@wartsila.com](mailto:training.fortlauderdale@wartsila.com)

### THE NETHERLANDS

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James Wattlaan 23  
5151 DP Drunen  
Telephone: +31(0)88 980 4000  
E-Mail: [Training.Drunen@wartsila.com](mailto:Training.Drunen@wartsila.com)

### FINLAND

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### INDIA

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Gate No. 2, Opp. Govt. Rest House  
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# WÄRTSILÄ LAND & SEA ACADEMY GLOBAL NETWORK



## ITALY

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34018 Trieste  
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## BRAZIL

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Wärtsilä Brasil Ltda.  
Rua Visconde de Inhaúma, 83 - Centro  
20091-007 Rio de Janeiro-RJ  
Telephone: +55 21 2206 2809  
E-mail: [Training.RioDeJaneiro@wartsila.com](mailto:Training.RioDeJaneiro@wartsila.com)

## SINGAPORE

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11 Pandan Crescent  
Singapore 128467  
Telephone: +65 6265 9122  
E-mail: [Training.Singapore@wartsila.com](mailto:Training.Singapore@wartsila.com)

## CHINA

Shanghai Training Centre  
Wärtsilä China Ltd.  
3F, Building 11  
170 Jin Feng Road, Pudong  
201201 Shanghai  
Telephone: +86 21 58585500  
E-mail: [Training.Shanghai@wartsila.com](mailto:Training.Shanghai@wartsila.com)

## INDONESIA

Jakarta Training Centre  
PT. Wärtsilä Indonesia  
Pergudangan Cardig Group  
Bandara Halim Perdanakusuma  
Jakarta Timur 13610  
Telephone: +62 (0) 21 2966 7820  
E-mail: [Training.Jakarta@wartsila.com](mailto:Training.Jakarta@wartsila.com)

## Fort Lauderdale Training Centre USA



WLSA Fort Lauderdale provides training and competence development programs to increase skills of both our customers and own personnel. We arrange specialized training programs for the cruise industry, offshore drilling, coast guards, tankers and other marine areas as well as power generation sector. These programs focus on heavy fuel plants, cogeneration, natural gas and crude oil.

## Khopoli Training Centre India



WLSA Khopoli training centre within the manufacturing facility provides added value to our marine and power plant customers in terms of learning experiences. The modern well appointed training facilities provide Theoretical, Practical and Advanced training. In addition to scheduled courses we are able to organise customised courses to meet customer needs both at training centre and customer locations.

## Turku Training Centre Finland



WLSA Turku offers technical product, operation and maintenance training to both internal and external marine and power plant customers. This training is exclusively provided for Wärtsilä products, e.g. engines, ancillary units, engine control simulators, monitoring systems, fuel systems for both diesel and gas operated installations.



WLSA Busan guarantees that your investment in employee development will translate into solid business results. We have a large range of training solutions and we can also define programs that meet the specific requirements of your organization and installations. Our professional instructors will teach and demonstrate the necessary skills to your employees to become competent and confident in their daily work. We fulfil international training standards with ISO, IMO and STCW95 requirements and permanently monitor delivery standards.

## Drunen Training Centre the Netherlands



WLSA Drunen provides dedicated training courses, tailored to fit the exact needs according to the agreed learning objectives for customers as well as Wärtsilä's own personnel.

Sharing knowledge and making a difference are of high importance in our Land & Sea Academy. In the Experience Centre we connect the theory with hands-on training using real Wärtsilä equipment. Safety aspects for operation and maintenance are an important part of any training course provided.





WLSA Trieste training centre offers a variety of courses for both customers and Wärtsilä personnel. The programs cover basic, advanced and fully tailored courses based on customer requirements, in addition to Wärtsilä product courses.

We have the know-how and practical experience to target learning objectives according to customer needs and expectations.

Rio de Janeiro Training Centre  
**Brazil**



WLSA Rio de Janeiro is dedicated to bring the customer's business success through competence development.

We work in close co-operation with our customers, offering both basic off-the-shelf courses and tailor-made technical, leadership and safety courses.

All training services courses can be delivered at training centre or at customer installations by arrangement.

## Shanghai Training Centre China



WLSA Shanghai is offering standard and tailor-made training courses for Wärtsilä 2-stroke engines (RTA and RT-flex), including hands-on training on simulators and mechanical components. Courses for other Wärtsilä products can be arranged on request.

In order to offer better training possibilities to our local customers, all training courses are also available in Chinese language (Mandarin).

## Singapore Training Centre Singapore



WLSA Singapore training facility offers standard and tailored customer training for 2-stroke products to meet customer needs including theoretical and operation with simulators provided by our specialised teams of certified instructors and engineers.

## Jakarta Training Centre Indonesia



WLSA Jakarta provides courses starting from basic and up to advance level performed in-class, operation (simulation), practical (hands-on) and/or tailor made 4-stroke and Power Plant trainings with certified trainers for both customers and Wärtsilä personnel. We are the solution of the successful business since we offer training and support to ensure that the personnel knows how to manage the assets at all times.









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Wärtsilä is a global leader in smart technologies and complete lifecycle solutions for the marine and energy markets. By emphasising sustainable innovation, total efficiency and data analytics, Wärtsilä maximises the environmental and economic performance of the vessels and power plants of its customers. In 2019, Wärtsilä's net sales totalled EUR 5.2 billion with approximately 19,000 employees. The company has operations in over 200 locations in more than 80 countries around the world. Wärtsilä is listed on Nasdaq Helsinki.

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