IHC TRAINING INSTITUTE
LOOK BEYOND YOUR HORIZON

“Educating your crew to open up the full potential of your vessel and equipment”

- trainers with extensive experience in the field
- over 5,000 people trained worldwide
- up to date in line with the latest marine technology
- special focus on safety and the environment
- training materials and simulators developed in house.
The IHC Training Institute offers a variety of training methods. Depending on your personal needs and circumstances, these methods are applied in our standardised open courses or the customised programmes. The below training methods can be taught as standalone courses or combined in a blended learning programme.

**ON-THE-JOB TRAINING**
- given by experienced dredge masters
- on-board training.

**SIMULATOR TRAINING**
- practice real-life scenarios in a controlled environment
- CSD, TSHD and backhoe simulator
- combination of theory and practice.

**CLASSROOM SESSIONS**
- interactive workshops
- customer case studies
- technical lectures.

**WEB-BASED TRAINING**
- at home or your office
- at any time.

**CONSULTING**
- advice from industry-leading experts
- solutions for complex dredging challenges.

**COMPETENCE MANAGEMENT**
- full-scale HR partner
- use of Dredge Operator Competence System (DOCS).

We offer courses for operators, technicians and engineers of cutter suction, trailing suction hopper and backhoe dredgers. Participants can work for contractors, governments, port authorities, equipment and service providers, and other organisations in the dredging industry.

**FOR WHO**
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**IMPROVE PERFORMANCE**
- An optimum operation requires a well-educated crew. The IHC Training Institute provides a full range of high-quality courses in the field of dredging for operators, technicians, project engineers and managers. We train contractors, governments, port and in-land water authorities, equipment and service providers, and other organisations in the dredging industry.
- Tailored to the equipment and requirements of our customers, we provide worldwide, local and on-the-job training. Our portfolio ranges from introduction courses to highly specialised masterclasses. Training is also provided at our facility in The Netherlands, which is equipped with state-of-the-art dredge simulators.
- We have built a team of lecturers, spanning a variety of disciplines, who combine practical knowledge from the field with the latest technical developments.

**HOW WE WORK**
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**BRIEF INTRODUCTION**
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We regularly organise open courses that are accessible to individual participants. These standardised training courses enable contractors, port authorities, NGOs, equipment providers, governments and research institutes to cost effectively get their employees trained on dredging operations and equipment.

The following open courses are given once or twice yearly:

- Introduction to dredging
- General dredging
- Soil mechanics in dredging
- Pumps and slurry transportation
- Beaver® engine training
- Radioactive concentration
- CSD operator training
- TSHD operator training
- Project staff training.

For more information about the courses, including dates and prices, please consult our training calendar on www.royalihc.com or contact us directly: training@royalihc.com

FUNCTION-RELATED COURSES
Most of our customers have very specific requirements for the contents of the courses they are looking for. Depending on their needs, we can either develop a completely new programme or tailor an existing one. Our customers can configure their courses and choose:

- Subjects and training goals
- Training methods
- Type of equipment
- Duration
- Location
- Group size.

EQUIPMENT-RELATED COURSES
For customers with dredging equipment manufactured by Royal IHC, we can arrange equipment-related courses that are tailored to the design and application of the new machinery. The IHC Training Institute will ensure the crew is familiarised with the newly-acquired equipment.

SPECIALIST COURSES
Our open courses usually cover the fundamental topics. However, we also have the knowledge to train our customers in more specialist areas. Among others, we provide tailor-made courses on pumps, cutter technology, environmental aspects of dredging, and wear and tear.

DREDGER OPERATOR COMPETENCE SYSTEM (DOCS)
DOCS is a methodology geared towards the assessment of a group of dredging operators on their competences. It gives an insight into their dredging competences and how they perform compared to the general standard – on an individual or group basis. The result of DOCS provides a baseline of the training needs for each individual operator and per job group.

After implementation, DOCS is also used for crew selection on different projects. Based on the competences of personnel, specific crews can be selected for particular projects. Additionally, the system allows for the identification of sub-par competences for future projects.

CUSTOMISED TRAINING
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The course involves the operation of your own dredging equipment. Highly-skilled and experienced Dutch dredge masters will provide practical instructions on board the vessel.

This training will strengthen and consolidate the theoretical and practical knowledge and skills of the maritime officers and pipe operators. They can then bring their knowledge and skills into practice during their daily duties and improve the overall efficiency of the dredger.

**TRAINING TOPICS**
The daily training programme will depend on the type of project, the situation on board and your individual training needs. Potential subjects include:

- desk controls
- start-up and shut-down procedures
- manoeuvring procedures
- dredging procedures
- dredging in different soil types
- operational optimisation for challenging situations
- production-optimisation
- safety procedures
- use of dredging automation
- maintenance of dredging installation.

**TRAINING METHODS**
An experienced IHC dredge master will visit your vessel and outline the latest tips and techniques on how to operate your dredger efficiently. The trainee will practice these operational procedures and the progress will be reported in the training logbook.

**TARGET AUDIENCE**

**TSHD ON-THE-JOB OPERATOR TRAINING**

**TRAINING GOALS**
- enhanced ability to operate dredgers
- improved understanding of the practical aspects in dredge operations
- increased knowledge to optimise production
- enhanced operational safety.
IHC’s on-the-job training programme will strengthen and consolidate the knowledge and skills of attendees. The dredge operators can then put what they learn into practice on a daily basis and improve the overall production and efficiency of their dredger.

TRAINING TOPICS
The exact training programme will be determined onboard the vessel and depends on the type of dredger, the skill level of dredge masters and the current project. Possible topics include:

• desk controls
• basic dredge procedures, swinging and stepping
• dredging procedures
• dredging in different soil types
• operational optimisation for challenging situations
• production optimisation of pump vacuum limitation, pump pressure limitation, cutter limitation or swing winch limitation
• working procedure of dredge and booster pumps
• safety procedures on board
• use of dredging automation
• daily inspection of dredging equipment
• maintenance of dredging installation.

TRAINING METHODS
The course involves the operation of your own dredging equipment. Highly-skilled and experienced dredge masters will provide practical instructions and offer industry leading advice on board your vessel.
The IHC Training Institute offers a maintenance training programme for the owners and crew of cutter suction dredgers. It covers all aspects of dredging equipment, such as electric installations and hydraulic systems. The course focuses on planned maintenance, condition-based monitoring and troubleshooting (corrective maintenance). This technical training can be provided for both technicians and operators.

**TRAINING TOPICS**

The exact training programme will be determined after consultation with the customer. Possible topics are:

- the design features of IHC equipment
- maintenance
- measuring – and reporting – wear and tear
- hydraulic systems
- mechanical systems and components
- electrical and/or PLC systems
- troubleshooting.

**TRAINING METHODS**

The course includes presentations, discussions and workshops. Trainees will perform practical assignments onboard the dredger during the training programme. In addition, time is allocated for participants to discuss their queries or the challenges they might face in the field.

**TARGET AUDIENCE**

- CSD MAINTENANCE
- TRAINING

**TRAINING GOALS**

- learn to perform inspections
- preventive maintenance skills
- enhanced troubleshooting skills
- increased technical knowledge
- learn to read dredger schematics.
The uptime and availability of your equipment are critical to achieving production targets. The deck and engine room crew must be familiar with the electrical, mechanical and hydraulic equipment on board.

During IHC's TSHD maintenance training programme, the initial operational procedures will be outlined and participants will be familiarised with the basic practical aspects of operating and maintaining the machinery on board.

**TRAINING TOPICS**

The exact training programme will be determined after consultation with the customer. Possible topics are:
- dredging installation
- main engines
- thermal oil, oil separators and boosters
- cooling water and fuel transfer systems
- propulsion systems
- hydraulic installations
- bilge, ballast and firefighting pumps.

**TRAINING METHODS**

The TSHD maintenance training programme is a practical course containing theoretical sessions. The schedule will cover a mixture of technical presentations and practical exercises that will be carried out in the classroom and on board your vessel. Ideally, participants should have a technical education and a good grasp of English.
CSD SIMULATOR TRAINING

IHC cutter suction dredger simulator (CSD) course gives trainees a unique opportunity to enhance their skills using state-of-the-art dredge technology. Theoretical classes are combined with this powerful simulation tool to make sure participants learn about dredge operations. This programme has been designed for operators of CSDs but many superintendents, works managers and project engineers are also trained to develop a firm grasp of the nature of operations on board CSDs.

TRAINING TOPICS
The following topics will be addressed during simulator classes:
• basic procedures, swing, step, spud operation
• start-up and shut down procedure
• breaking in procedure
• (re)anchoring procedure
• relation between swing width, dredging depth and step size
• optimization of dredging process
• emergency procedures.

The following subjects can be addressed during classroom sessions:
• cutting technology and hauling
• suction processes and discharge processes
• dredge plan, setup and construction
• process limitations in relation to working methods and working parameters
• production optimisation
• soil mechanics in relation to the dredging process
• working methods
• pump and slurry transportation process
• use of booster stations
• daily reporting (delays, efficiency, up and down time)
• maintenance (the advantages of different maintenance management methods in relation to the operation).

TRAINING METHODS
Theoretical and practical training will take place in the classroom and on a simulator. The course is held in The Netherlands, and is performed with the use of realistic 3D simulators providing underwater views.

TARGET AUDIENCE

TRAINING GOALS
• improved skills for the technical and economical use of your CSD
• enhanced knowledge for operational preparations
• in-depth knowledge to optimise production
• skill development for different dredging procedures
• ability to dredge in challenging situations.
During this training programme, maritime officers and pipe operators of TSHDs will have the unique opportunity to further enhance their skills on advanced state-of-the-art dredge simulators. Trainees can train on real-life scenarios in a controlled environment without risk of hazardous situations or loss of production. In addition, office staff can be trained on the simulator to develop an understanding of the operation on board a TSHD.

### TRAINING TOPICS

- practical aspects
- desk controls
- basic dredging exercises
- startup and shut down procedures
- settlement processes
- suction processes
- dumping processes and procedures
- emergency procedures.

The below subjects will be addressed during classroom sessions:

- functions on board
- excavation process (cutting, erosion, jetting)
- pumping processes
- trip optimisation
- working procedures on board
- inspection of dredging installation
- essentials of soil mechanics
- project approach and work methods.

### TRAINING METHODS

Theoretical and practical training will take place in both the classroom and on a simulator. The course is held in The Netherlands and performed with the use of realistic 3D simulators providing underwater views.

### TARGET AUDIENCE

**TSHD SIMULATOR TRAINING**

**TRAINING GOALS**

- increased ability to perform basic dredge operations
- familiarisation with modern TSHD automation and control systems, such as SCADA, STPM and DLM
- improved understanding of the processes and skills required for hopper operations
- optimisation of dredge production
- ability to dredge in challenging situations.
Tendering for a dredging project requires you to propose realistic production estimates. This course covers all relevant aspects, which must be taken into account when preparing them. It deals with the theoretical production calculation method based on production models and historical performance method.

TRAINING TOPICS
The following subjects will be addressed:
- tender documents
- geotechnical investigations
- bathymetry/volume estimations
- equipment selection
- pumps and slurry transportation (theoretical)
- production calculation for CSDs and TSHDs
- estimations of dredge efficiency.

TRAINING METHODS
A mixture of presentations, discussions and individual assignments will be carried out in the classroom. The participants will also be required to work out multiple cases. Equipment performance graphs of the customer’s own vessels will be used, and practical assignments in the IHC soil lab are included.

This training is practical, but enough time is allocated to discuss any queries and challenges participants might face in the field.

TRAINING GOALS
- analysing project constraints
- selecting the correct equipment
- giving realistic production estimates of CSDs
- providing realistic production estimates for TSHDs
- making basic cost estimates.
The safety training can help to reduce the number of accidents, ensure compliance with industry regulations and transform the safety culture within your company. It will also prepare a crew for emergencies and minimise employee exposure to hazardous situations.

TRAINING TOPICS
The following subjects will be addressed:
- safety regulations and safety certificates
- safe working routines and conditions for working on board a dredger
- safety observation on board
- safety checks on certificates of equipment and personnel
- hazard identification meetings (HAZID)
- personnel protective equipment (PPE)
- safety equipment installed on board
- safety documents and a reporting system for safety
- simulation of accidents occurring on board (safety drill).

TRAINING METHODS
The trainer will assess the safety situation on board the vessel and focus on any situation needing attention. The fundamentals of safe operation of machinery and safety equipment are explained in a classroom. The course will be concluded with a safety drill.

TARGET AUDIENCE
- OPERATORS
- TECHNICIANS
- PROJECT ENGINEERS

TRAINING GOALS
- refresh knowledge and skill to effectively follow safety procedures
- identify dangerous situations in an early stage
- knowledge of the current safety regulations
- contribute to the company ‘safety culture’.
Pumping slurry is a complex and important process. During the training course, emphasis is put on the hydraulic transport of solid-water mixtures with centrifugal pumps and through pipeline systems. The programme is aimed at project office engineers, and R&D and design engineers.

**TRAINING TOPICS**
The course will focus on different aspects of the pump and slurry process, such as:

- dredge pump and drive characteristics
- dynamic effects (pump and drives)
- pipeline systems
- the interaction between pump, drive and pipelines
- the influence of solid particles
- dynamic effects in the pump – pipeline systems
- the fundamentals of hydraulic transport and dredge pumps.

**TRAINING METHODS**
This course is practical and case-driven. Practical problems are used to teach the theoretical background of the pump and slurry transport processes. Cases are also used to improve the problem-solving skills of attendees.

**TRAINING GOALS**
- analysing the processes involved in hydraulic slurry transport
- performing pump calculations
- assessing the interaction between pump, drive and pipelines.
The course focuses on the tuition of hydrography and its relevance to dredging. Hydrographic surveying is used for hydrographic X-Y-Z measurement of the sea or river floor. The survey data is processed to obtain depth contour maps and carry out volume calculations. The hydrography and dredging training will result in better measurements, presentation and interpretation of soil conditions. This will ultimately improve the efficiency of the dredging operation.

TRAINING TOPICS

The following topics will be addressed:

• survey in dredging (pre, intermediate and post)
• horizontal positioning
• vertical positioning
• data processing
• data presentation
• practical instrument and software checks, and start up
• practical sensor handling
• practical instrument calibration
• practical sailing patterns.

TRAINING METHODS

The programme consists of two parts – classroom-based training to cover the fundamentals of hydrography and a two-day field course, when hydrographic instruments are used on board a survey vessel.

TARGET AUDIENCE

HYDROGRAPHY IN DREDGING TRAINING

OPERATORS

PROJECT ENGINEERS

TRAINING GOALS

• explain the different measuring methods
• interpret collected hydrographic data
• explain the link between dredging and bathymetry
• understand the statistical data processing methods
• read the presented survey data
• upload the profiles into existing representation software on board a dredger.
The course is dedicated to the operational and strategic management involved in port development. It allows the participants to expand and improve their skill sets in managing and controlling dredging in their port.

**TRAINING TOPICS**

The following subjects will be addressed:

- dredging equipment types and project overview
- different dredging applications within a port
- scoping the site
- fundamentals of hydrographic surveying
- design of navigation projects
- dredging strategies for the operation of maintenance dredging
- dredging market
- procurement strategies
- risk allocation and risk management strategies
- contract administration
- claim prevention and conflict management
- master planning of port maintenance.

**TRAINING METHOD**

The training course is highly practical and case-driven. Theoretical knowledge of maintenance dredging is applied to practical challenges from the field, and successful cases from various ports are used to highlight different scenarios. Brainstorming sessions in small groups are planned to develop alternative strategies for the operation of maintenance dredging in each participant’s own port.

**TRAINING GOALS**

- better understanding of port design in relation to shipping, nautical depth and soil conditions
- explain the different dredging equipment types and boundaries of use
- increased insight into the costs involved in dredging projects
- enhanced knowledge of risk allocation and risk management strategies
- environmental aspects of dredging activities.

**TARGET AUDIENCE**

PORT MAINTENANCE TRAINING

**PROJECT ENGINEERS**

**MANAGEMENT**