



KONGSBERG

Kongsberg Maritime Simulation and Training

The power to excel in Dynamic Positioning training



The rapidly expanding offshore fleet and move into deeper waters has created strong demand for Dynamic Positioning (DP) systems. Revised STCW guidelines, new simulator guidance from the International Marine Contractors Association (IMCA), requirements from the Nautical Institute (NI) and the DNV SeaSkill DP-Package have raised the bar of both DP training as well as the simulator equipment used for training, assessment and certification. As the leading developer of sophisticated DP simulators, KONGSBERG offer several tailored solutions in compliance with all the latest training regulations.

Simulator training allows sea-time reduction

The NI training scheme for obtaining a Dynamic Positioning Operator (DPO) certificate is a time consuming process, which involves onshore courses and DP watchkeeping experience on DP vessels.

With today's advanced DP simulators, it is possible to implement a steeper learning curve through intensive and realistic training on complex DP scenarios. The NI has recently released a set of simulator requirements, whereas the highest class, NI-A, is a full mission DP simulator intended for running sea-time reduction training. The equivalent class from Det Norske Veritas is DNV Class A(DP).

Certain intensive DP courses conducted on a compliant class NI-A simulator will have the possibility to significantly reduce the necessary period of supervised DP watchkeeping.

3 types of courses currently allows sea-time reduction according to Nautical Institutes requirements:

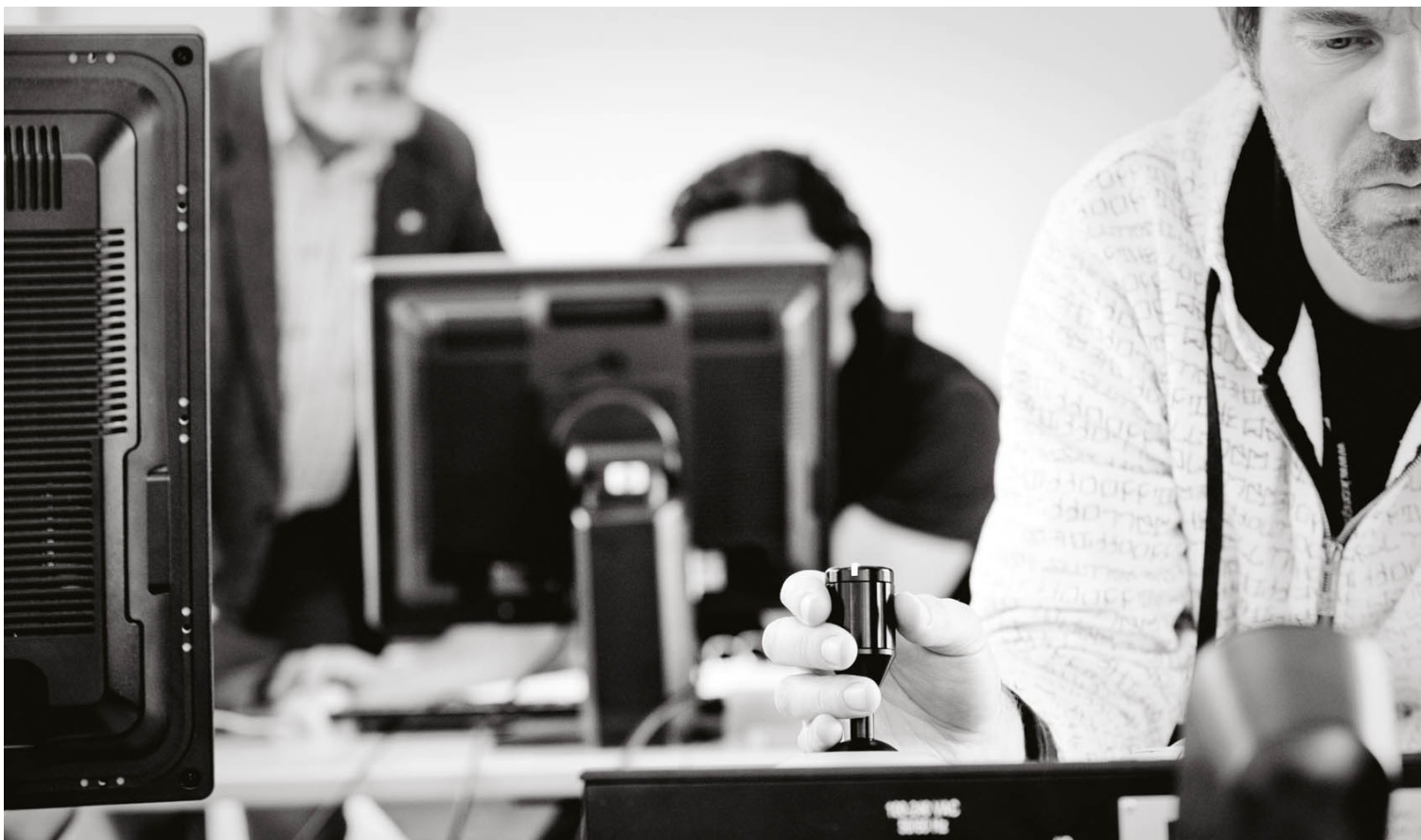
- Intensive DP simulator training
- Shuttle tanker offshore loading courses
- DP competence, assurance and Practice training (DPCAP)

For common training centres, the most relevant courses to offer are the two mentioned below:

| Intensive DP simulator training | DP sea-time reduction |
|--|------------------------------|
| 1st week | 6 weeks (42 days) |
| 2nd week | 6 weeks (42 days) |

| Shuttle tanker offshore loading | DP sea-time reduction |
|--|------------------------------|
| Phase 2, 22.5 hrs simulator time | 5 weeks (35 days) |
| Phase 3, 15 hrs simulator time | 3 weeks (21 days) |

Up to 84 days of DP training at sea can be replaced in any combination of the courses. For more details, please consult the document *'The Nautical Institute Dynamic Positioning Operator's Certificate, August 2010 revision'* or contact KONGSBERG.



Requirements on visual systems

The visual reference plays an important role during many offshore operations. In a simulated environment the realism of exercises will be taken to a whole new level when adding a surrounding scene. DNV introduced visual requirements in 2007 making surrounding scene mandatory for obtaining certification of simulator system according to DNV cert. note 2.14 Class A (DP). Nautical Institute requires visual system for simulator class NI-A and will from 2014 require visual scene also for class NI-B.

For training centres currently using KONGSBERG's K-Pos or SDP systems, upgrade packages are available. Please contact us for further information.

Safe training on critical operations

KONGSBERG DP simulators offer great flexibility to fit a wide range of training objectives. They are compliant with the latest requirements and can therefore be used during the DPO certification process. Further, KONGSBERG's simulators have the necessary fidelity and realism required for engineering and mission planning, as well as assessment of existing or new crews, where various operations can be evaluated, studied and optimised in the simulator. Spending time in the simulator is also beneficial for experienced crews. Critical malfunctions and emergency situations can easily be introduced to the students; providing the possibilities for training in scenarios that approach the edge of operation limits, training that can only safely take place in a simulator.

Maximum flexibility
Kongsberg DP simulators are designed with great flexibility to fit a wide range of training objectives. The simulators offer safe and realistic training on critical operations and are ideal to build competence and skill to reduce vessel down-time and to increase efficiency.



Realistically simulated operations

KONGSBERG DP simulators are designed to support operations, to test procedures, increase competence and to minimise errors, therefore reducing the amount and ultimately the cost of incidents during DP operation. Examples of offshore operations that can be realistically simulated are:

- Close proximity ship handling in offshore areas, e.g. platform support vessels approach to platforms, buoys and FPSOs
- Realistic offshore loading such as buoy loading, tandem loading and tug assistance
- Offshore operations; supply-, construction- and dive support vessels etc.
- Semi-submersible/drilling vessel station keeping with use of DP during drilling operations
- Emergency manoeuvring

KONGSBERG DP simulators provide training for most types of DP vessels and configurations including supply vessel, shuttle tanker, drillship and semi-submersible platform. Additionally KM has developed several customer specific ship models with corresponding DP and hydrodynamic models.



Adaptable to different needs

Basic Trainer/limited task simulator

KONGSBERG provides three levels of DP simulators, limited task, multi task and full mission. The limited task simulator, also called the basic trainer, is normally used throughout the basic and general training of DP operators. The desktop operator stations comprise a full operator panel connected to a PC and are arranged in a classroom setting with an instructor station. All DP stations normally simulate the same vessel and DP system configuration, but operate independently of each other.



Basic Trainer/limited task simulator
The system comprises a DP operator panel connected to a standard PC. The Basic Trainer is typically arranged in a classroom setting of up to 10-12 students and an instructor who control and monitors the students exercise.

Advanced Trainer/multi task simulator

At the next level we have the multi task simulator, called the advanced trainer, which is normally used for advanced/simulator courses in the NI training scheme. The realism and quality of the training will increase by extending the simulator with a visual scene and by adding bridge equipment. This will allow more procedural training and new types of courses. KONGSBERG's dual redundant and type approved K-Pos DP system is integrated to the simulator, so operators can gain experience on exactly the same DP system that is used for controlling hundreds of vessels worldwide. Due to the performance and the large market share of KONGSBERG DP systems, many shipowners prefer to use the exact same KONGSBERG DP equipment when training their crews.



Advanced Trainer/multi task simulator
The system comprise a dual redundant K-Pos DP operator console and a DP controller. The system is connected to an instructor station with dedicated operator functions to control the various vessel settings and introduce various levels of faults to occur in the exercise.

DP Manoeuvring Simulator

The last and most advanced level of simulators used for DP training is the full mission type. It is designed to meet the requirements for sea-time reduction courses and demanding offshore vessel operations. The full mission system is a manoeuvring simulator with up to 360° surrounding visual scene including a dual redundant K-Pos configuration fully integrated to the KONGSBERG ship handling or offshore vessel simulator. Bridge equipment, Radar/ARPA and ECDIS systems are all included, and a planning station for presentation of field maps is available. The simulator layout comes in two different standard set-ups, aft bridge and forward bridge.

Additional equipment like centre console, operator stations for position reference systems etc., can easily be integrated in this flexible simulator design.

All DP simulators from KONGSBERG are both modular and scalable, meaning additional functionality can be added at a later stage to fit into the long term plan for the training centre.





Picture BW Cidade de São Vicente with courtesy of Petrobras

Customer Feedback

Equipped with the latest KONGSBERG K-Pos advanced and basic trainers, The Centre for Marine Simulation (CMS) at the Marine Institute of Newfoundland, provides training to Deck Officers and other staff engaged in critical tandem loading operations between tankers and offshore production loading structures.

In real scenarios, the DP tanker will maintain position by use of thrusters, rudders and main engines during the loading/offloading operation. A critical area of concern is the ability of vessels to manoeuvre safely in the area of the offshore facility and then maintain a position relative to the facility or platform during the loading operation.

CMS provides simulator training of these demanding operations in order to plan and raise skills for crews bringing the vessel through approach, loading and departure procedures. By using Kongsberg DP simulator acting with exact vessel-specific performance to winds, waves and current, they are able to offer the ultimate in training realism.

“The knowledge obtained from the Tandem Loading simulation exercises assists CMS to meet the guidelines for the safe operation of DP Tankers in relation offshore loading operations and help maintain CMS at the forefront of offshore simulation training for customers worldwide” says **Capt. CHRISTOPHER HEARN**, Director, Centre for Marine Simulation (CMS) at the Marine Institute of Newfoundland (CMS). “The successful development and delivery of this type of bespoke training speaks to the excellent working relationship we have with Kongsberg. Our specific requirements were met by Kongsberg much to our satisfaction. As we grow this training to match the expansion of the Newfoundland offshore industry, we will continue to look to KONGSBERG to assist us in meeting our needs” he concludes.

Integrated systems for extended training possibilities

Reference systems

The position reference systems are vital components in a DP system and play an important role during simulator based training. Interfaces are available to position reference systems delivered by KONGSBERG as well as third party products. Examples are satellite navigation systems, hydroacoustic position reference systems like HiPAP®, laser based system such as CyScan® and Fanbeam® and radar based systems including RADIUS® and Artemis®. Operator stations with user interface are available for DGPS, HiPAP®, Artemis® and RADIUS® and more user interfaces are under development.

Power management

Knowledge and operational experience of the power management system is vital during DP operations. Blackout of main electrical power to thrusters or the vessel control system is a critical situation. From experience and incident data onboard DP vessels, it is clear that training of operators against correct routines and procedures on board is vital to understand the vessel's power and thrust redundancy. KONGSBERG has considerably improved the power management simulation in the

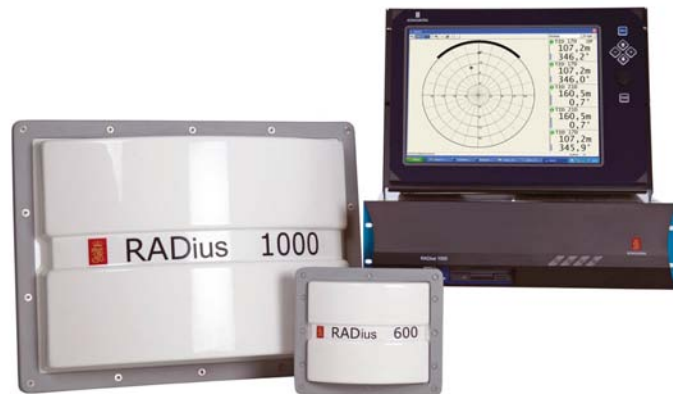
latest release of the simulation software. The new features are implemented using the instructor station to operate the engineer position during training. The instructor has full access to the vessel's power plant and distribution system and may introduce errors and breakdowns.

Available upgrade packages

For customers interested in the new simulator concepts several upgrade packages are available:

- Operator interface for RADIUS®, HiPAP®, Artemis® etc. – position reference systems with user interface
- cJoy® system – independent joystick system widely used on vessels
- Vertically mounted screens – for enhanced vertical visual scene
- Additional consoles and hardware panels – to increase realism
- Additional offshore simulation modules – extended functionality like crane or anchor handling operation
- Specialized simulation of specific real offshore operations including operation concept studies

For the ultimate realism in training
The DP simulators can be fully integrated with Kongsberg position reference systems and third party products, as well as various bridge equipment found aboard different offshore vessels.



Making a difference

With more than 30 years of experience gained from close to 1500 DP systems in operation KONGSBERG has established itself as a pioneer and industry standard within the dynamic positioning industry. The same unique experience, knowledge and equipment are transferred and used in our DP simulators, making it possible to offer our customers a totally integrated simulator from one supplier, KONGSBERG.

Our state of the art DP simulators can be used for multi-purpose training. All are in compliance with the latest training regulations, whereas e.g. the full mission simulator opens up for sea-time reduction training, enabling new course possibilities for DP-training centres. The flexibility and scalability of KONGSBERG DP-simulators is a real advantage. Choose the level of simulator you need and adapt the technology to your course portfolio with the addition of e.g. new position reference systems, functionality, vessel models, targets and and sailing areas if required.

We will offer your training centre support and assistance through all phases in the simulator life cycle; design and facility requirements, drawings and animations are all vital components before and during construction work. Installation, SAT and start-up of the simulators will be performed by our experienced technicians. To maximise the performance and minimise down time, proactive maintenance and upgrades can be offered through KONGSBERG's Long-Term System Support Program (LTSSP). Services related to training and teaching are available through product courses, train the trainer programs, including assistance with curriculums and exercises.

KONGSBERG take pride in providing the products and assistance you need in order to optimize your DP-simulation training!

For further information and offers please contact km.simulation.sales@kongsberg.com



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