



NAVIGATION, FISH-FINDING AND CATCHING SIMULATOR
TO TRAIN CREW WORKING ON FISHING VESSELS

K-Sim® Fishery

Training solutions improving safety, efficiency, and sustainability in fishery operations

An increased global focus on the safety and productivity of fishing has raised the bar for improved training methods. Kongsberg Maritime's new K-Sim Fishery simulator is specifically designed to support education and training of students and crew within the fishery industry.

The simulator enables training in all key operations on board. It simulates the bridge of a fishing vessel maneuvering and operating in diverse environments and weather conditions. By fully integrating state-of-the-art Simrad fish-finding and fish-catching instruments, it enables the exact type of training fishermen need to build competence.

Through realistic training scenarios, K-Sim Fishery promotes better performance in navigation, fish-finding, and fish-catching, contributing to significant safety and sustainability improvements.

Meeting the training demand for fisheries

The fishery industry's increased focus on safety and productivity is addressed by the IMO through the implementation of STCW-F requirements for the training of crew of seagoing fishing vessels 24 meters in length and above.

Further, DNV has introduced certification standards for simulators used in fishery training to ensure high standards in training (ST-0033 Section 14 Fishery Operation)

K-Sim® Fishery is a state-of-the-art new training simulator specifically made to comply with STCW's and DNV requirements of building competence for crew working on fishing vessels.



"The investment in the new K-Sim Fishery simulator is a very important contribution for us in the northern part of Norway. It enables us to build on the future of fishing. In addition to education in safe and efficient navigation and ship handling for fishing, practice on the simulator's search and catch instrumentation will help both new and veteran fishermen perform better. The simulator will also enable increased competence and career progression for crew who wish to further develop skills in navigation and in new and different fishing methods to meet today's higher standards of fish quality."

- Finn Axel Hartvigsen, Manager Maritime Department, Lofoten Vocational School

K-Sim Fishery benefits

- Builds competence promoting safety, efficiency and economy in fishing operations like; trawl, purse seine and long line
- Realistic physical and visual environment with integrated real fishing gear enabling familiarization and realism in training scenarios
- Advanced hydrodynamic simulation reproducing realistic vessel- and equipment behaviour in various conditions for correct learning
- Familiarization and training in fish-finding and -catching by use of integrated Simrad fishing gear, including split beam echo sounder, omni directional sonar, trawl- and catch monitoring systems
- Intuitive and efficient instructor system, enabling full control of the exercise and replay for debriefing, feedback and assessment to students
- 3D visualization and physical representation of the trawl in different current layers and on the aft deck to understand the behaviour and load to improve efficiency and reducing risk in operations
- Dynamic stability simulation of the vessel in all phases of the catch scenarios
- Flexibility to re-configure and expand to adapt to changing training needs

Student learning objectives

- Utilizing the vessel's navigational equipment
- Selection and set-up of the fishing gear, (e.g. adjustment of trawl door angle)
- Utilizing the sonar to locate fish in the vicinity of the vessel
- Utilizing the equipment in locating and classifying potential fish targets
- Observing and classification of sonar target, to determine the species present, the total biomass, the size distribution, and the probability of by-catch
- Maneuvering the fishing vessel so that the line is deployed in the correct position
- Monitoring the performance of fishing gear
- Using the winches to maximize the performance of fish gear
- Analyzing weight distribution and stowage of fish on board

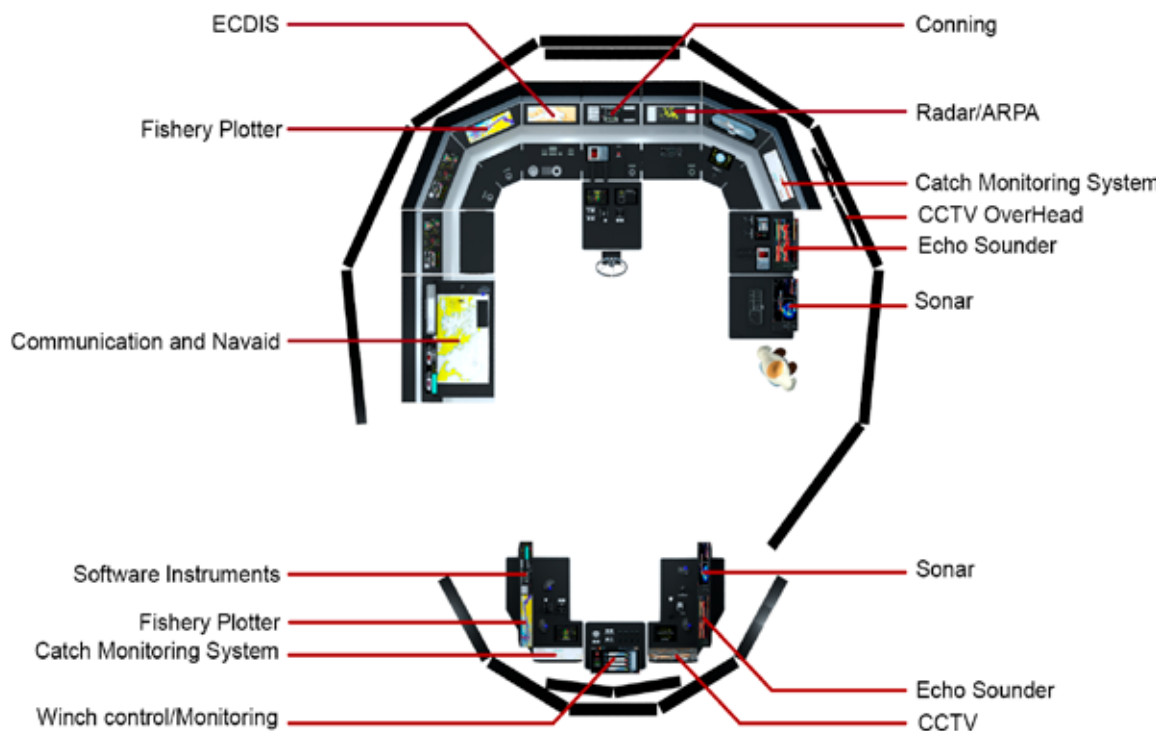
A complete and flexible simulator system

Designed as a fishing vessel bridge with all necessary bridge- and navigation instruments surrounded by a visual scene. K-Sim Fishery forms a complete system for education and competence development of crew.

For the ultimate familiarization, K-Sim Fishery is fully integrated with Simrad's real fishery echo sounders, sonars and catch monitoring systems and also includes winches for handling fishing equipment such as purse seine, trawl and long line.

Due to the simulator's advanced physical engine, both vessel and equipment has realistic behaviour with impact from e.g. current, wind, load and force.

K-Sim Fishery allows for customized configuration and can be delivered as a basic DNV Class C simulator or an advanced DNV class A system. It can be designed as a stand-alone system, or as an additional integrated module to Kongsberg Maritime's K-Sim Navigation or K-Sim Offshore simulators.



The illustration above shows an overview of the standard equipment of an DNV GL Class A simulator, whereas the * indicates the additional instruments and equipment needed to accommodate fishery exercises on a typical Class A bridge simulator.

The pictures below show aft bridge configurations on a trawler to the left, and a customized configuration for beam trawling to the right.



Integrated Simrad fish-finding and catching instruments

K-Sim Fishery is integrated with Simrad's fish-finding instruments; SU90-omni directional sonar and ES80 - wideband echo sounder. The simulator system enables full familiarization with how to handle these advanced instruments in order to optimize operations. Typical training possibilities are:

- Locate fish in the vicinity of the vessel
- Adjust sonar parameter settings for:
 - type of fish; pelagic and flatfish
 - environmental conditions; weather, hydro-acoustic, bottom, depth
 - classification of fish to determine species present and total biomass
 - size distribution and probability of by-catch
 - selection of suitable sonar and echo sounder settings

Fish-catching training possibilities

K-Sim Fishery is integrated with Simrad's catch monitoring system, TV80, and simulates various catching methods like trawl, purse seine, and long line. In the simulator, weather, current, and seabed conditions can be set for realistic behavior of the fishing vessel and fishing gear. As in real life, the students can use a combination of winch handling and vessel maneuvering to catch the fish. Typical training with various fishing gear equipment are:

Trawling

- Deploy (shoot) the trawl: Demersal trawl, pelagic trawl
 - Operate trawl winch system: Trawl warp and net winch, spooling device
 - Trawl behavior:
 - warps, doors, headline, foot rope, ground gear, top and bottom
 - panel, cod-end
 - monitor position and opening of the trawl using the TV80 catch monitoring system
 - observe fish entering the trawl using the 'trawl eye' echogram
 - sensors indicate 1/3, 2/3 and 3/3 trawl capacity
 - commence hoisting the trawl at the correct time
- Automatic trawl control including automatic trawl survey systems

Purse seine

- Deploy (shoot) the purse seine
 - pay out on the purse net
 - maneuver the vessel at the same time so that the purse seine net surrounds the fish school
 - operate the purse seine winch, haul in the purse line to prevent the fish from escaping underneath the net
 - catch the initial buoy of the purse seine net and haul in the purse seine so that the fish school is caught quite close to the vessel
- Taking fish onboard
 - filling the storage tanks
 - monitor the vessel stability during the loading process

Long line

- Maneuver and deploy (shoot) the lines
- Relocate and pick up line as well as anchored or drifted lines
- Demersal longlines: cod, haddock, cusk, ling, redfish
- Pelagic longlines: tuna, billfish, swordfish, haddock, greyfish

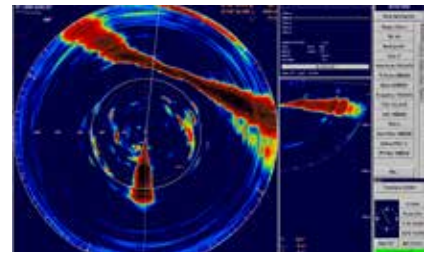
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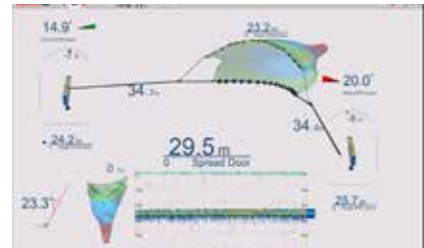
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Simrad SU 90 omni directional sonar



Simrad TV80 catch monitoring system



K-Sim Fishery Instructor System



K-Sim Fishery provides a range of fishing vessel models facilitating training in different fishing methods, such as; trawling, beam trawling, purse seine, and long line