

# K-SIM CARGO



KONGSBERG



## K-Sim<sup>®</sup> Cargo LNG tanker – Membrane

### KONGSBERG CARGO HANDLING SIMULATORS

K-Sim liquid cargo-handling simulators provide quality training in complex load and discharge operations. Reality-based exercises can simulate various cargo system configurations and load conditions, providing improved competence in safe, sustainable, and competitive cargo operations.

Our model library is based on actual ship specifications and performance data. It includes product tanker, chemical tanker, LPG/ethylene tanker, LNG tankers, Suezmax tanker, and very large crude carrier (VLCC).

K-Sim Cargo can be customized to exact requirements, upgraded and expanded at any time and integrated with our other ships simulators, enabling interdepartmental training.

Operators of LNG tankers must be familiar with process-controlled operations to maintain control at the start of loading and discharging. If the cargo boils off too fast or the tank is cooled down too fast, pressure or vacuum can lead to extreme temperatures damaging the tanks or the hull structure.

### Model description

Our K-Sim Cargo-LNG membrane model is based on a real LNG tanker. The model consists of four Gaztransport Technigaz (GTT) design membrane tanks able to take fully refrigerated cargoes. A compressor room is fitted with two high-duty compressors and two low-duty compressors. Several cargo heaters/vaporizers are fitted in the compressor room, as are a separate ballast system, a nitrogen generator, and an inert gas generator with dryer system. The cargo temperature and environment data may be set individually. The tank atmosphere and temperature data are calculated continuously. The boiling-off operation is also a natural part of the scenario.

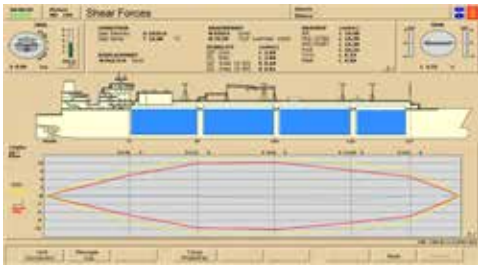
### STCW requirements

The LNG-M model meets the requirements of STCW section A-II/1, A-II/2, A-II/3, A-III/1, A-III/2, and A-V/1. These sections cover

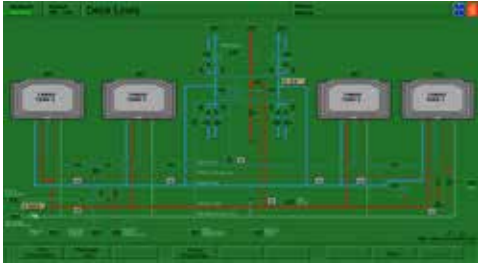
- planning and ensuring safe loading
- care during the voyage and unloading of cargoes
- trim, stability, and stress to maintain seaworthiness of the ship

### DNV GL certification

This model is certified and approved according to DNV GL's Standard for Certification of Maritime Simulator Systems ST-033 March 2017.



MD 104 shear forces



MD 121 deck lines



CCTV

## MODEL FEATURES AND DETAILS

### Vessel's main particulars

Displacement	114153 MT
Length overall	285.40 m
Length bpp	274.40 m
Breadth moulded	43.40 m
Depth moulded	26.00 m
Summer draught	11.35 m
Design speed loaded	19.75 knots

### Vessel details

Cargo tanks	4 – Gaztransport Technigaz (GTT design)
Cargo capacity	145914 m <sup>3</sup>
Max pressure	23 kPa
Min. perm. temp.	-163°C
Max. perm. specific grav.	500 kg/m <sup>3</sup>
Disch. pump capacity	1650 m <sup>3</sup> /h at 150 mLC
Ballast tanks	15

Note: Specifications subject to change without notice

## TRAINING LEVELS AND OBJECTIVES

### Training levels

The simulator solution can be provided both as a desktop system for classroom training and as a full mission system. A BigView 3D interactive mimic with 3D pop-up displays also available for enhanced familiarization of the cargo operations.

The simulator is suited for the following training:

- Junior officers in basic cargo operations
- Senior officers in full-scale cargo operations (loading/discharging/ cooling down /venting)
- Senior officers and captains in advanced cargo-handling operations

### Training objectives

The training objective of this model is to understand the total cargo handling operation. Specific training objectives include the following:

- Familiarization with all parts of the cargo system
- Planning a cargo-loading or discharge operation using the high duty compressors and cargo heaters when required
- Lining up for loading and ballast handling simultaneously (check atmosphere)
- Controlling the flow into each tank and the trim/list of the ship
- Controlling the atmospheric pressure and temperatures
- Topping up and finalizing loading
- Laden voyage with boil-off to boiler
- Preparing and lining up for discharge
- Starting up discharge
- Emptying and draining tanks
- Finalizing departure ballast
- Inerting tanks after docking, and cooling down before loading (use of spray system)
- Inerting and venting tanks for inspection/docking

Datasheet version:  
K-Sim Cargo LNG tanker – Membrane  
March 2019.

