
ADVANCED TRAINING FOR OIL TANKER CARGO OPERATIONS



TRAINING COURSE

Based on the IMO Model Course 1.02

SEMINAR TIMETABLE & OUTLINE



1. SEMINAR TIME TABLE

DAY 1	09:00 – 09:15	Introduction & Learning Objectives
	09:15 – 11:00	Knowledge of oil tanker design, systems and equipment
	11:00 – 11:15	Coffee Break
	11:15 – 13:30	Knowledge of oil tanker design, systems and equipment (<i>continued</i>)
	13:30 – 14:00	Lunch Break
	14:00 – 17:00	Simulation Exercise No.1 De-Briefing

DAY 2	09:00 – 11:00	Pump theory, types of cargo pumps and pressure surge
	11:00 – 11:15	Coffee Break
	11:15 – 11:45	Pump theory, types of cargo pumps and pressure surge (<i>continued</i>)
	11:45 – 12:45	Safety Systems Monitoring and ESD
	12:45 – 13:15	Lunch Break
	13:15 – 14:45	Cargo Measurements and Calculations
	14:45 – 16:45	Hands-On Practice on Calculations & Demonstration

DAY 3	09:00 – 10:00	Effect of oil cargoes to trim, stability and structural integrity
	10:00 – 11:00	Hands-On Practice on Loading Instrument
	11:00 – 11:15	Coffee Break
	11:15 – 12:15	Hands-On Practice on Loading Instrument <i>(continued)</i>
	12:15 – 13:15	Tanker Safety Culture & Safety Management System Implementation (TMSA)
	13:15 – 13:45	Lunch Break
	13:45 – 15:30	Cargo-related Operation Plans, Procedures and Check-Lists

DAY 4	09:00 – 11:00	Loading and Discharge Plans
	11:00 – 11:15	Coffee Break
	11:15 – 12:30	Ballasting and De-ballasting Operations
	12:30 – 13:00	Simulation Exercise No. 2
	13:00 – 13:30	Lunch Break
	13:30 – 17:00	Simulation Exercise No. 2 <i>(continued)</i> De-briefing

DAY 5	09:00 – 11:00	Cargo-related Operations Inerting – Gas Freeing – Tank Cleaning
	11:00 – 11:15	Coffee Break
	11:15 – 12:30	Cargo-related Operations COW, Load on Top and STS Cargo Transfer Operations
	12:30 – 14:00	Simulation Exercise No. 3
	14:00 – 14:30	Lunch Break
	14:30 – 17:00	Simulation Exercise No. 4 De-briefing

DAY 6	09:00 – 10:30	Physical and Chemical Properties of Oil Cargoes
	10:30 – 11:00	Hazards and Control Measures Associated with Oil Tanker Cargo Operations
	11:00 – 11:15	Coffee Break
	11:15 – 13:45	Hazards and Control Measures Associated with Oil Tanker Cargo Operations <i>(continued)</i>
	13:45 – 14:15	Lunch Break
	14:15 – 16.15	Calibration and Use of Gas Detection Equipment
	16:15 – 17.00	Management and Supervision of Cargo-Related Responsibilities

DAY 7	09:00 – 11:00	Knowledge and understanding of safe working practices, including risk assessment and personal shipboard safety
	11:00 – 11:15	Coffee Break
	11:15 – 13:00	Knowledge and understanding of Emergency Procedures
	13:00 – 13:30	Lunch Break
	13:30 – 14:00	Actions in case of structural damage and oil spill
	14:00 – 15:30	Knowledge of Medical First Aid procedures (MFA) on board oil tankers

DAY 8	09:00 – 10:30	Understanding of Pollution Prevention Procedures
	10:30 – 11:15	Knowledge and Understanding of MARPOL 73/78 and other IMO and Industry Guidance
	11:15 – 11:30	Coffee Break
	11:30 – 13:00	Knowledge and Understanding of MARPOL 73/78 and other IMO and Industry Guidance <i>(continued)</i>
	13:00 – 14:00	Case Studies
	14:00 – 14:30	Lunch Break
	14:30 – 17:00	Case Studies <i>(continued)</i>
	17:00 – 17:15	Course Closing – Discussion

B. SEMINAR OUTLINE

No.	Knowledge, Understanding and Proficiency	Use of Teaching Methods		
		Lectures	Hands-On Practice	Marine Simulation
DAY 1				
Competence 1: Ability to Safely Perform and Monitor All Cargo Operations				
1	Knowledge of Oil Tanker Design, Systems and Equipment			
	1.1 General Arrangement and Construction			
	1.2 Pumping Arrangement and Equipment			
	1.3 Tanks Arrangement, Piping and Tank Venting			
	1.4 Gauging Systems and Alarms			
	1.5 Cargo Heating Systems			
	1.6 Tank Cleaning, Gas Freeing and Inerting Systems	} 4 HRS		
	1.7 Ballast System – Introduction to BWMS			
	1.8 Cargo Tanks Venting and Accommodation Ventilation			
	1.9 Slop Arrangements			
	1.10 Vapour Collection & Recovery Systems			
	1.11 Cargo Electric and Electronic Control Systems			
	1.12 Environmental Protection Systems – ODME			
	1.13 Tank Coatings			
	1.14 Tank Temperature and Pressure Control Systems			
	1.15 Fire Fighting Systems			} 3.0 HRS
SUB-TOTAL		7.0 HRS		

Explanatory Notes

The 4.0 HRS lectures will be delivered till the completion of the last topic (1.15). A Video explaining the IGS principles of operation will be projected for subject area 1.6.

Simulation Exercise No.1 – LCHS Familiarization

A desk top/Liquid Cargo Handling Simulator (Class C) will be made available to each one of the participating Officers, while (4) more trainees can be accommodated in the Full-Mission (Class A) Liquid Cargo Handling Simulator. The aim of the Exercise No.1 is to provide the necessary familiarization with the LCHS Simulator, so that all Officers better understand the systems and equipment of an oil tanker, the basic tanker operations, the remote (CCR) and local (deck) handling and controls.

The simulated model ship will be the SCC-II (a Suez Max Crude Oil Carrier) and each trainee will have access to the following built-in documents and drawings.

- SCC-II General Arrangement
- SCC-II Cargo Lines Drawing
- SCC-II IGS
- SCC-II Ullage Tables
- SCC-II COW Manual
- SCC-II K-Loadicator Manual
- SCC-II Alarms List

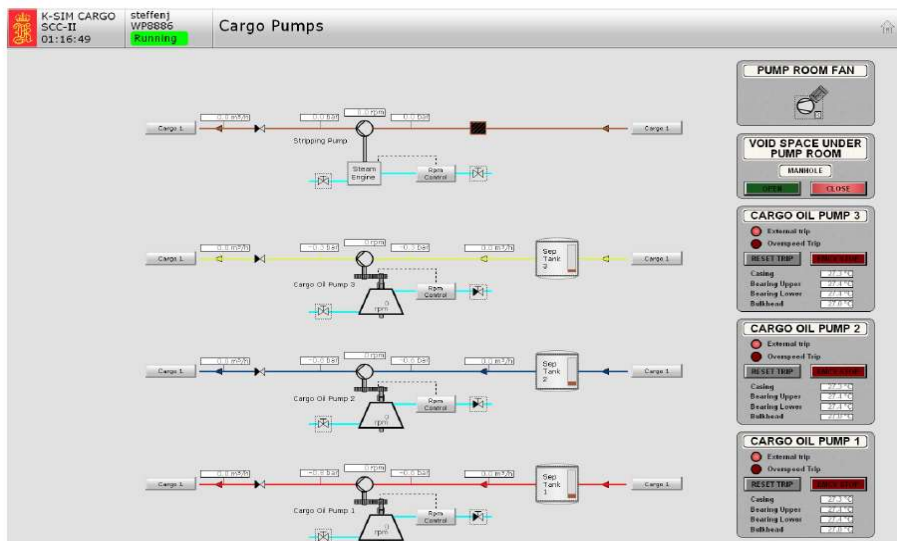


Knowledge, Understanding and Proficiency
No.
DAY 2
Use of Teaching Methods
Lectures
*Hands-On
Practice*
*Marine
Simulation*
Competence 1: Ability to Safely Perform and Monitor All Cargo Operations

2	Knowledge of pump theory and characteristics, including their types of cargo pumps and their safe operation		
2.1	Pump theory and types of cargo pumps	2.5 HRS	
2.2	Pressure surge		
4	Knowledge and Understanding of Monitoring of Safety Systems, including the Emergency Shut-down	1.0 HRS	
5	Loading, Unloading, Care and Handling of Cargo		
5.1	Ability to perform cargo measurements and calculations	1.5 HRS	2.0 HRS

SUB-TOTAL 7.0 HRS
Explanatory Notes

Subject Area 2.1 Demonstration of a Framo SD 200 training pump with cross sectional cuts of the concentric hydraulic pipes, the volute and impeller sections.



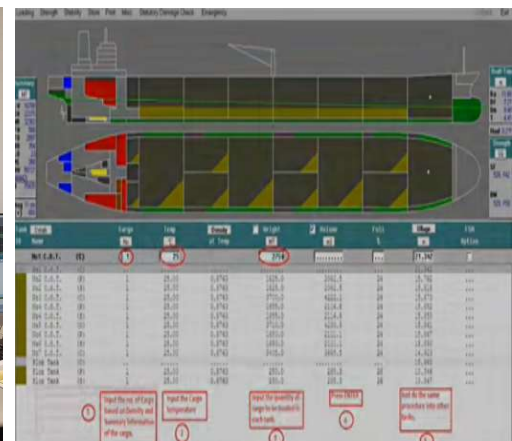
Subject Area 5.1. Practice on a flow chart of cargo calculations in the following sequence:

- Cargo tanks gauging (ullage, temperature and interface)
- Total Observed Volume calculation from ullage tables
- Gross Observed Volume calculation (TOV – free water)
- Gross Standard Volume (GOV X VCF)
- Loading Volume Calculation
- Loading mass calculation (in air and vacuum)
- VEF explanation

No.	Knowledge, Understanding and Proficiency	Use of Teaching Methods		
		Lectures	Hands-On Practice	Marine Simulation
DAY 3				
Competence 1: Ability to Safely Perform and Monitor All Cargo Operations				
6	Knowledge of the effect of bulk liquid cargoes on trim, stability and structural integrity	1.0 HRS	2.0 HRS	
3	Proficiency in tanker safety culture and SMS implementation	1.0 HRS		
8	Development and application of cargo-related operation plans, procedures & check-lists.	1.5 HRS		
SUB-TOTAL 5.5 HRS				

Explanatory Notes

Subject Area 6. The participating Officers will learn the extent of information provided in the Loading and Stability Information Booklet, and what should be always calculated during the planning of a cargo operation, so that the tanker is operated in compliance with the requirements of the International Code on Intact Stability. Hands-on practice will follow with their familiarization on a Loading Instrument software (ANKO Marine Load Planner), during which, stability and strength considerations will be made in relation to Simulation Exercise No.2.



No.	Knowledge, Understanding and Proficiency	Use of Teaching Methods		
		Lectures	Hands-On Practice	Marine Simulation
DAY 4				
Competence 1: Ability to Safely Perform and Monitor All Cargo Operations				
7	Knowledge & Understanding of Oil Cargo Related Operations			
7.1	Loading and Unloading Plans			
7.2	Ballasting and De-ballasting Operations	3.0 HRS		4.0 HRS
SUB-TOTAL 7.0 HRS				

Explanatory Notes

Simulation Exercise No.2 - Preparation for Loading Operation – Loading

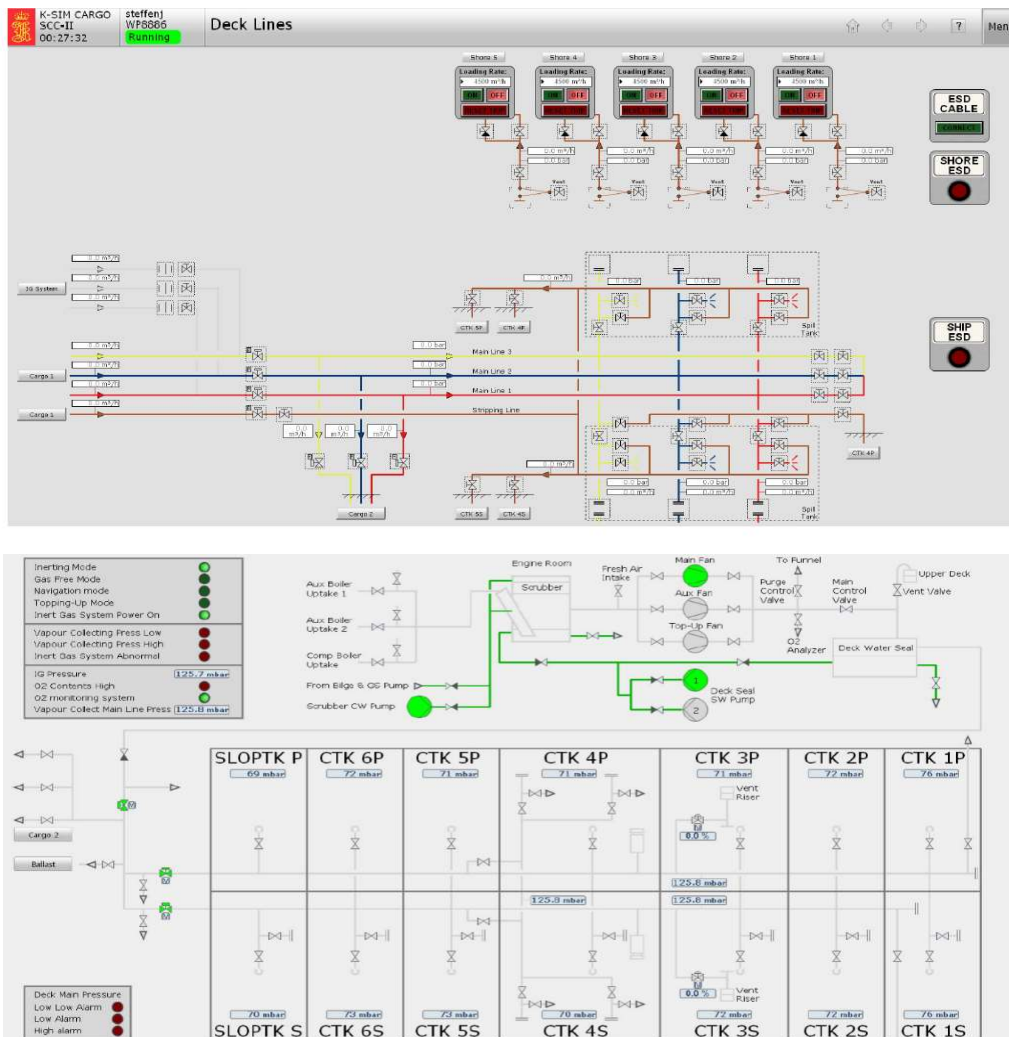
By loading a fully homogenous cargo, it is aimed to understand and work out the stability and stress criteria applicable to the vessel, as well as all necessary steps to plan a loading operation till 98% filling completion.

No.	Knowledge, Understanding and Proficiency	Use of Teaching Methods		
		Lectures	Hands-On Practice	Marine Simulation
DAY 5				
Competence 1: Ability to Safely Perform and Monitor All Cargo Operations				
7	Knowledge & Understanding of Oil Cargo Related Operations			
7.3	Tank Cleaning Operations			
7.4	Inerting			
7.5	Gas Freeing			
7.6	Ship to Ship Transfer Operations	3.0 HRS		4.0 HRS
7.7	Load on Top			
7.8	Crude Oil Washing			

SUB-TOTAL 7.0 HRS

Explanatory Notes

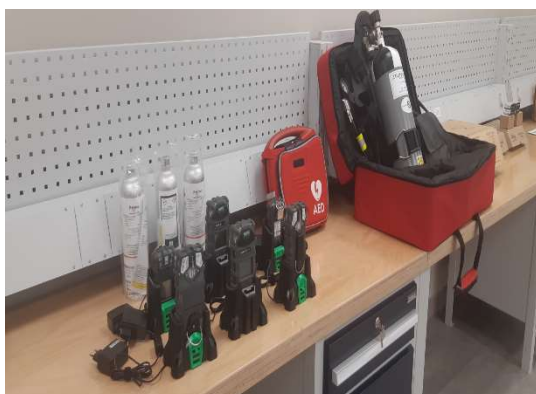
1. Simulation Exercise No.3 Initial Inerting
2. Simulation Exercise No.4 Purging and Gas Freeing



No.	Knowledge, Understanding and Proficiency	Use of Teaching Methods		
		Lectures	Hands-On Practice	Marine Simulation
DAY 6				
Competence 2: Familiarity with Physical and Chemical Properties of Oil Cargoes				
11	Knowledge & Understanding of Physical and Chemical Properties of Oil Cargoes			
11.1	Physical Properties	1.0 HRS		
11.2	Chemical Properties			
11.3	Understanding the Information contained in MSDS		0.5 HRS	
Competence 3: Take Precautions to Prevent Hazards				
12	Knowledge & Understanding of the Hazards and Control Measures Associated with Oil Tanker Cargo Operations			
12.1	Toxicity			
12.2	Flammability and Explosion			
12.3	Health Hazards			
12.4	Inert Gas Composition	3.0 HRS		
12.5	Electrostatic Hazards			
12.6	Oxygen Deficiency			
12.7	Non-compliance with Rules and Regulations			
Competence 1: Ability to Safely Perform and Monitor All Cargo Operations				
9	Ability to Calibrate and Use the Gas Detection & Monitoring Equipment	1.0 HRS	1.0 HRS	
10	Ability to Manage and Supervise Personnel with Cargo-Related Responsibilities	0.5 HRS		
SUB-TOTAL		7.0 HRS		

Explanatory Notes

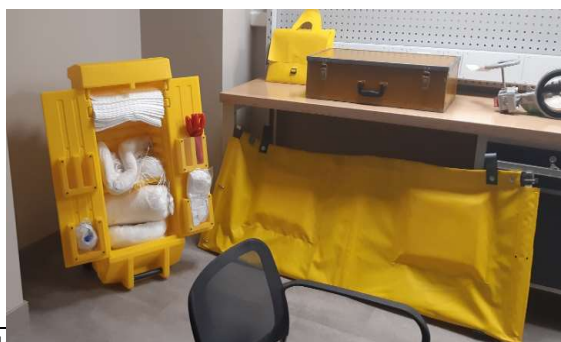
- Subject area 11.3. It will involve familiarization with the structure and details of a commercially available MSDS of a crude oil. The extent of information contained will be asked to be compared with the information required to be provided by the supplier to the ship according to the Resolution MSC.286(86).
- Subject area 9. Demonstration of use and calibration of portable gas instruments. Familiarization of the trainees will take place on the following instruments:
 - MSA ALTAIR 5X Gas Detection Instrument for LEL/O₂/H₂S/CO (2 Instruments)
 - MSA ALTAIR 5X Gas Detection Instrument IR for Butane/O₂/H₂S/CO (2 Instruments)
 - MSA ALTAIR 4XR Personal Gas Detection Instrument LEL/O₂/H₂S/CO (2 Instruments)



No.	Knowledge, Understanding and Proficiency	Use of Teaching Methods		
		Lectures	Hands-On Practice	Marine Simulation
DAY 7				
Competence 4: Apply Occupational Health & Safety Procedures				
13	Assessment and Understanding of Safe Working Practices Risk Assessment and Personal Shipboard Safety			
13.1	Precautions relating to Enclosed Spaces & SCBA use			
13.2	Precautions during Repairs and Maintenance Work			
13.3	Hot and Cold Work Precautions	1.5 HRS	0.5 HRS	
13.4	Electrical Safety			
13.5	Use of the appropriate PPE			
Competence 5: Respond to Emergencies				
14	Knowledge and Understanding of Emergency Procedures			
14.1	SOPEP			
14.2	Cargo operations emergency shutdown			
14.3	Actions to be taken in case of cargo-essential systems or services	1.5 HRS		
14.4	Fire-fighting			
14.5	Enclosed Space Rescue			
15	Actions in case of collision, grounding, spill	0.5 HRS		
16	Knowledge of MFA Procedures for Oil Tankers	1.0 HRS	0.5 HRS	
SUB-TOTAL		5.5 HRS		

Explanatory Notes

- Subject area 13. Demonstration of a SCBA and of a portable air filling compressor.
- Subject area 15. The participating Officers will be able to see a sample of oil spill collection equipment similar to those used in deck, enclosed areas or pump room spill containment operations consisting of anti-spark material, sorbents and a skirt-type oil boom.
- Subject area 16. Demonstration of CPR (cardiopulmonary resuscitation) and of a defibrillator.



No.	Knowledge, Understanding and Proficiency	Use of Teaching Methods		
		Lectures	Hands-On Practice	Marine Simulation
DAY 8				
Competence 6: Take Precautions to Prevent Pollution of the Environment				
17	Understanding of procedures to prevent pollution of the atmosphere and the environment			
	17.1 Pollution prevention requirements of ship's construction & equipment	1.5 HRS		
	17.2 Control of Operational Pollution at Sea			
Competence 7: Monitor and Control Compliance with Legislative Requirements				
18	Knowledge & Understanding of MARPOL 73/78 & other IMO and Industry Guidance	2.0 HRS		
19	Case Studies	2.5 HRS		
SUB-TOTAL 6.0 HRS				

Explanatory Notes

- Subject area 17.2.

The participating Officers will be given an overview of how a 2-stage oil-water separating equipment operates to ensure that permissible discharges at sea can be made in case of machinery spaces bilge water and dirty ballast in machinery spaces' ballast tanks.

- Subject area 19. Case studies to be presented and discussed refer to:

- Explosion/fire on a small oil tanker in dockyard, due to accumulation of hydrocarbons released from motor spirit in the fore peak tank.
- Deviation from agreed discharge plan leads to a cocktail mixture.
- On deck contained oil spill during cargo lines stripping operations.