

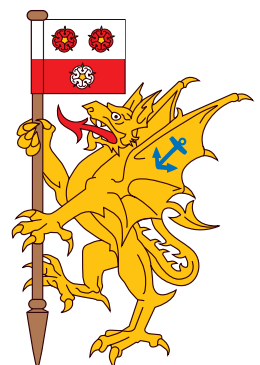
INTERTANKO

Tanker Officer Training Standards (TOTS)

4A Chemical Tanker Simulator Training Course



Poseidon
Challenge



WARSASH
MARITIME ACADEMY



INTERTANKO

Tanker Officer Training Standards (TOTS)

4A Chemical Tanker Simulator Training Course

CONTENTS

Prerequisites	1
TOTS Reference	1
STCW 95 Reference	1
Physical Realism	2
Behavioural Realism	2
Operating Environment	2
Simulator Facility	2
 Simulator Exercises	
Exercise 1. Simulator and ship familiarisation	4
Exercise 2. Cargo planning – paper exercise	5
Exercise 3. Tank preparation, washing and inerting.....	6
Exercise 4. Commence loading at the first load port.....	7
Exercise 5. Mid loading, monitoring commence more loading, ballast.....	9
Exercise 6. Complete loading first port.....	10
Exercise 7. Loaded voyage, monitoring, agitation.....	11
Exercise 8. First discharge, second load port.....	12
Exercise 9. Mid second port – loading, discharge & pre-wash	13
Exercise 10. Completion of discharge including stripping.....	14
Exercise 11. Wash, ventilation, & cooling.....	15
Exercise 12. Discharge residues at sea according to MARPOL.....	16
 Appendix I Cargo Stowage Plan – After first load port.....	 17
Appendix II Cargo Stowage Plan – After second load/first discharge.....	18

All rights reserved. No part of this publication may be reproduced in any material form (including photocopying or storing it in any medium by electronic means and whether or not transiently or incidentally to some other use of this publication) without the written permission of the copyright owner. Applications for the copyright owner's written permission to reproduce any part of this publication should be addressed to the publisher.

© **INTERTANKO** 2008

Disclaimer

Whilst every effort has been made to ensure that the information contained in this publication is correct, neither the authors nor INTERTANKO can accept any responsibility for any errors or omissions or any consequences resulting there from.

No reliance should be placed on the information contained in this publication without independent verification.

Tanker Officer Training Standards (TOTS)

4A Chemical Tanker Simulator Training Course

Prerequisites

It is intended that by the time candidates are given this tanker simulator training, they will have experienced sea time on similar tankers and have taken part in the similar exercises to those simulated here. This encounter with simulated exercises should not be their first experience of such operations.

It is intended that the simulator used for this training will enable demonstration of the following competencies:

TOTS Reference

TOTS 4A

Competence

Training in chemical tanker operations

STCW 95 Reference

Table A-II/1.9

Competence

Monitor the loading, stowage, securing, care during the voyage and unloading of cargoes.

Table A-II/3.6

Table A-II/3.8

Table A-III/1.11

Maintain seaworthiness of the ship.

Table A-II/2.11

Plan and ensure safe loading, stowage, securing, care during voyage and unloading of cargoes.

Table A-II/12.2

Table A-II/2.13

Table A-III/12.12

Carriage of dangerous cargoes.

Control trim, stability and stress

Table A-II/2.14

Table A-III/2.13

Monitor and control compliance with legislative requirements and measures to ensure safety of life at sea and protection of the marine environment.

Section A-V/1.19

Section A-V/1.21

Ship operations (chemical tanker)

Emergency operations (chemical tanker)

For instructor, supervisor and assessor qualifications see STCW 95 Regulation I/6, Section A-I/6 paragraph 3 and A-I/12 paragraphs 6 to 9.

Physical Realism

IMO Model Course 1.04 Part D Appendix 9

The simulator used should fulfil the following minimum requirements:

- It will simulate a typical cargo handling system found on a chemical tanker based on real operational vessels.
- The equipment is arranged in a ship like manner.

The simulator includes the following components and subsystems:

- Cargo control system
- Ballast control system
- Tank cleaning system
- Overboard discharge and monitoring systems
- Tank content monitoring systems
- Inert / venting control system including sparging, gas freeing, purging and aerating.
- Tank atmosphere control system
- Alarm system
- Communication system
- Cargo pumping system
- A system for communicating with 'the outside world'
- A stability and stress calculator.

Additional resources: Ship/shore check list
Tank washing checklist
NLS Cargo record book extracts
Log sheets

Behavioural Realism

IMO Model Course 1.04 Part D Appendix 9

The simulator model replicates the dynamic behaviour of the cargo handling system and its parameters. Furthermore, the simulator model simulates the components, their processes and control systems. It will be possible to introduce failures, breakdowns and wear to all equipment simulated.

Operating Environment

IMO Model Course 1.04 Part D Appendix 9

The simulator will simulate restrictions and failures in the cargo transfer, for instance, introduced by the simulated shore terminal. Alarms will be announced by flashing alarm lamps and sound in the 'cargo control room'.

Simulator Facility

These exercises have been written taking into account the variety of simulators which may be used to facilitate them. As few specific features as possible have been featured, so as to increase the adaptability of the exercises to the various simulators available.

The tanker in this package is double hulled, has 10 pairs of wing tanks, 2 to 8 of which are subdivided into centre and wing spaces. Each tank has its own pump, vent line and manifold. There are 2 ballast pumps. The ballast tank arrangement has not been specified.

However, the simulator should have its own Cargo Operations Manual which will be used during the training.

Simulator Exercises

- Exercise 1.** Simulator and ship familiarisation
 - Exercise 2.** Cargo planning – paper exercise
 - Exercise 3.** Tank preparation, washing and inerting
 - Exercise 4.** Commence loading at the first load port
 - Exercise 5.** Mid loading, monitoring commence more loading, ballast
 - Exercise 6.** Complete loading first port
 - Exercise 7.** Loaded voyage, monitoring, agitation
 - Exercise 8.** First discharge, second load port
 - Exercise 9.** Mid second port – loading, discharge & pre-wash
 - Exercise 10.** Completion of discharge including stripping
 - Exercise 11.** Wash, ventilation, & cooling
 - Exercise 12.** Discharge residues at sea according to MARPOL
- Appendix I** Cargo Stowage Plan – After first load port
- Appendix II** Cargo Stowage Plan – After second load/first discharge

Exercise Descriptions

What follows by way of exercise descriptions has been written in the form of students' objectives. In order to prevent multiple duplication, the notes may also form guidance for instructors.

EXERCISE 1

Ship and simulator familiarisation

Objective

The purpose of this exercise is to help you become familiar with the operation of the simulator and the cargo system. It is suggested that during this first exercise, a ballast pump is started in order for a ballast space to be topped off. This will give you an opportunity to practice pump, line and valve control. It is also suggested that the Inert Gas system is started and the cargo system pressurised, in order for you to familiarise yourself with the inerting process.

Information

The vessel has just departed from drydock, so the cargo system is gas free and will need inerting. All bunkers, fresh water and ballast are as per the normal ballast condition, other than the forepeak ballast tank, which needs topping up.

Note: It is appreciated that not all liquid cargo simulators will have exactly the same functions incorporated. The following are suggestions of systems with which you need to be familiar:

1. Check the various pages of the vessel display and especially the location and activation of the EMERGENCY STOP function.
2. Locate the individual CARGO and BALLAST tank status pages, not forgetting each element of the ballast system including fore and aft peak tanks, if within the ballast system.
3. Familiarise yourself with the DRAFT INFORMATION, which will be important for arrival status and when stripping cargo and ballast tanks, as well as any draft restrictions.
4. Establish how to co-ordinate POWER REQUIREMENTS for deck and cargo gear. These requirements will alter depending on the operation, so you need to be familiar with their source and the planning of requirements.
5. Be familiar with GENERAL OPERATING PARAMETERS in terms of maximum and minimum levels. On the simulator in use can ambient weather conditions be altered?
6. The pages of the simulator screen detailing the CARGO TANK selection and preparation, valve, level and alarm functions will need close attention.
7. Bearing in mind the number of confined spaces on tankers the GAS DETECTION panels will be of particular concern.
8. It is crucial that BALLAST CONTROL, valves, level and alarm functions are monitored frequently during these operations.
9. Some cargoes require accurate CARGO TEMPERATURE CONTROL functions, water, steam or thermal oil.
10. A number of exercises require the use of TANK WASHING functions, supplying either sea or fresh water.
11. Almost all exercises involve INERT GAS, NITROGEN AND VENTING ARRANGEMENTS. Certain exercises will also include VAPOUR RECOVERY, so a close familiarity with these functions will be necessary.
12. Some tank preparation requirements will involve MECHANICAL VENTILATION so the function of the fans supplying this is important to master.
13. PUMP CONTROLS of each type of pump should be mastered early in the programme, which is partly why operation of the ballast pump is included in this familiarity exercise.
14. The functions of the MANIFOLD CONTROLS require familiarity.
15. Do not forget the tank DRAINING AND STRIPPING arrangements for cargo and ballast systems, as they will be utilised during the training.
16. Do not forget either to monitor the status of the ballast tank being worked during this familiarisation exercise.

EXERCISE 2

Cargo planning – Paper exercise

Objective

To plan the stowage of a series of parcels, with reference to the USCG cargo compatibility chart, taking into account the segregation of incompatible cargoes. A cargo plan is appended to this package so the cargoes included therein may be used for this exercise, if the training establishment so desires.

Information

It is important to discuss the following in accordance with the objectives of this exercise:

- Cargo quantities and tank capacities
- Physical and reactive properties of each cargo
- Compatibility of each cargo parcel
- Tank segregation
- Temperature control requirements
- Vapour return requirements
- Cargo distribution with respect to hull stresses
- Method of producing plan
 - *Data gathering for each parcel*
 - *Compatibility of each parcel*
 - *Final stowage plan*

Competence Requirements

Understand the principles of cargo planning, incorporating compatibility chemical manual issues (including exceptions) and data guide segregation,

Understand the influence the physical properties of cargo parcels will have on the stowage plan

Understand the need for tank preparation with specific reference to tank atmosphere control, including safety and commercial issues.

The general scenario is that the vessel is in the normal ballast condition with fresh air in all the cargo tanks. There are no residues onboard.

Note:

Since the feasible permutations of appropriate plans is huge, as long as all requirements of compatibility and physical issues are met, a pre-arranged plan will be utilised for the remainder of this training programme.

EXERCISE 3

Tank preparation washing and inerting

Objective

This exercise is focussed on the objective of preparing the vessel to start trading. Cargo orders have already been received and these include high specification cargoes which will require well prepared tanks. This exercise will involve the final stage of the preparative process involving a hot fresh water wash of tanks 6CP&S, 7CP&S, 1P&S, 2P&S. In addition, tanks 5CP&S need to be inerted with nitrogen.

Information

1. Set up the tank washing system and fresh water heating arrangements, in order to wash the pairs of tanks detailed above in the objective, 6C P&S, 7C P&S, 1 P&S, 2 P&S.
2. In the interests of best practice, pressure test the washing system prior to use, at a test pressure marginally above the working pressure. This test may be carried out with cold rather than hot water. You must decide whether fresh or sea water will be an appropriate medium for this test, noting the preparation requirements of the next cargo in those tanks.
3. 5C P&S will need inerting with nitrogen. Again, you must decide which method of inerting is most appropriate for the circumstances: dilution or displacement.
4. All fixed and portable gas detection and analysing equipment has been checked, calibrated and is ready for use.

Competence Requirements

1. In the interests of best practice, ensure the relevant channels of communication are working smoothly.
2. You have already familiarised yourself with the nitrogen plant, during Exercise 1, so it is now time to use that knowledge for the purpose of inerting the said tanks.
3. Bear in mind the pressure settings in the tank P/V valves, consider carefully the inlet velocity of the nitrogen into the tanks and pay close attention to the delivery and main pressures.
4. Consider carefully the ambient temperatures, including air and sea temperatures. Remember that vast differences in such temperatures inside and outside of the tanks could result in condensation. The resultant potential cargo contamination issues could be commercially damaging. Ensure the dewpoint of the nitrogen destined for 5C P&S is of low dewpoint, to ensure a dry tank atmosphere.

Ensure you become well practiced with draining and stripping procedures during this washing operation, in the light of the cargo operations to follow in due course.

EXERCISE 4

Commence loading

Objective

Plan and execute a loading operation, with due accordance with safety and pollution preventative measures. Ensure pre-cargo checks and tests are carried out, including alarms.

Information

1. The vessel is securely moored port side alongside.
2. Cargo tanks will have been cleaned and prepared ready for loading. The vessel is ballasted to the normal arrival ballast condition.
3. You will have had to prepare a cargo loading and de-ballasting plan and it will be important to follow the plan to enable the two operations to be conducted simultaneously.
4. The vessel's draft, trim, list and stresses are not to exceed normal operational parameters.

The tanks to be loaded at the first load port are as follows:

1 P & S and 2 P & S	Potassium Hydroxide Solution 40%
3 C P & S and 4 P & S	Benzene
6 C P & S and 7 C P & S	Acetonitrile
8 C P 7 S and 9 C P & S	Acetic acid
10 P & S	CTC

5. Of these grades, Potassium hydroxide solution 40%, Acetonitrile, and CTC will be started in this exercise in any order of your choosing. Benzene and Acetic Acid will be started in the next exercise as the Benzene requires a vapour return line.
6. When planning this loading operation take into account the maximum loading rates of each tank, in relation to its venting capability.

Competence Requirements

1. Monitor the way in which the loading of each grade is commenced with respect to communications, loading rates and number of tanks.
2. Monitor the sampling procedures.
3. Once loading has started in the requisite cargo tanks, monitor the way in which de-ballasting operations are managed.
4. Demonstrate frequent monitoring of all cargo and ballast tanks, to ensure that empty tanks are not leaked into. At this first load port, each parcel is being loaded into four cargo tanks, with the exception of the CTC, which is going into two tanks.
5. Demonstrate how the discharge pressures of the ballast pumps should be monitored. The cargo manifold back pressure should be constantly monitored and recorded in the cargo log.
6. General communications with deck crew and terminal should be maintained efficiently.
7. Whilst alongside, mooring and security watches need to be maintained.
8. You should agree with the terminal the sampling procedures to be followed for each grade.
9. State which tank alarms require testing before loading commences.
10. State which checks are required on the venting systems.
11. State which provisions are made for gas testing.

Loading Plan

Load Port 1

Cargo to Load

Potassium Hydroxide 40%	Tanks	1P, 1S, 2P, 2S
Benzene	Tanks	3CP, 3CS, 4CP, 4CS
Acetonitrile	Tanks	6CP, 6CS, 7CP, 7CS
Acetic Acid	Tanks	8CP, 8CS, 9CP, 9CS
CTC	Tanks	10P, 10S

Note that loading will commence with Potassium Hydroxide 40%, acetonitrile and CTC. At the terminal's request, the loading of Benzene and Acetic Acid will commence about two hours after the start of the other grades.

Deballasting

Draw up a ballasting plan which will take into account the sailing condition of the vessel. Remember that trim and list may be adjusted to facilitate the draining and stripping of cargo tanks.

Calculate, with the aid of the simulator facility, the vessel's draft

Port 2 - Load / Discharge

Cargo to Load

Toluene	1840m ³	Tanks	3P, 3S, 4P, 4S, 5P, 5S
Propylene Oxide	840m ³	Tanks	5CP, 5CS
Acetone	2250m ³	Tanks	6P, 7P, 8P, 9P
Methanol	2200m ³	Tanks	6S, 7S, 8S, 9S

Cargo to Discharge

Potassium Hydroxide	All Tanks
Benzene	All Tanks
Acetic Acid	All Tanks
CTC	All Tanks

Tanks to be pre-washed

CTC tanks, 10P&S

EXERCISE 5

Mid loading, monitoring, commence more loading, de-ballast

Objective

During this exercise multiple operations will be occurring simultaneously so you will have an opportunity to experience the need to monitor and manage each of them. The nature of the chemical parcel tanker is such that it is vital to be familiar with this type of 'multi-tasking'. It is also important to be able to utilise the resources at your disposal and ensure that smooth channels of communications are kept running.

Information

1. The vessel has already started to load the following cargo;

1 P & S and 2 P & S	Potassium Hydroxide Solution 40%
6 C P & S and 7 C P & S	Acetonitrile
10 P & S	CTC
2. This exercise will involve the loading of the following;

3 C P & S and 4 P & S	Benzene – this parcel will require the vapour recovery arrangement.
8 C P 7 S and 9 C P & S	Acetic acid
3. De-ballasting plans should have been made in order to counteract the stability implications and stresses imposed by the movement of these parcels.

Competence Requirements

1. Ensure you are comfortable with the loading of the initial group of parcels. Be familiar with routine and frequent checks of ullages and of the ballast pumps.
2. State which checks should you make prior to starting to load these two parcels.
3. State which are the static electricity implications at the start of loading a tank. At what point may the maximum bulk loading rate be requested.
4. State what action should be taken to avoid multiple tanks attaining their topping off ullage at the same time.
5. State what are your options should you be unable to cope with so many simultaneous operations.
6. State how the loading rate of the Benzene parcel may be affected by the use of the vapour return manifold.

EXERCISE 6

Complete first loading port

Objectives

This exercise is designed to familiarise you with the management of multiple operations concurrently with topping off cargo tanks and clearing of lines.

Information

The parcels of CTC, acetonitrile and potassium hydroxide are close to topping off and their loading will be completed during this exercise. Those of Acetic Acid and Benzene have not long started.

All tanks continue to need monitoring, no matter what their status. However, the original planning of staggering the parcels approaching their finish can come to fruition during this exercise.

Lines are to be cleared on completion of loading each grade.

The following tanks will be topped off during this exercise:

1 P & S and 2 P & S	Potassium Hydroxide Solution 40%
6 C P & S and 7 C P & S	Acetonitrile
10 P & S	CTC

Loading will continue into;

3 C P & S and 4 P & S	Benzene
8 C P 7 S and 9 C P & S	Acetic acid

De-ballasting will also continue.

Competence Requirements

1. All tanks continue to need monitoring, no matter what their status. However, the original planning of staggering the parcels approaching their finish can come to fruition during this exercise.
2. Lines are to be cleared on completion of loading each grade.
3. State which tanks will reach finishing ullage first.
4. State how a staggered topping off sequence can be established.
5. State what the respective advantages and disadvantages between a 'ship stop' and a 'shore stop' are.
6. State what is the principle concern on the tanker is when the terminal request the clearing at their cargo lines.
7. Discuss the control of loading rates as tanks approach their topping off.
8. State why communication with the terminal is so important during this stage of the cargo operation.
9. State what the possible consequences are of closing a tank valve against the flow of cargo being loaded from ashore.
10. Discuss the strategy adopted by the students during the topping off of the various tanks. Were communications tested and was a reduction in loading rate requested before each tank reached its filling level.

EXERCISE 7

Loaded voyage, monitoring, agitation

Objectives

As well as general monitoring and cargo care, the Benzene parcel will require agitation or re-circulation, bearing in mind its viscosity and freezing point temperature. For the first time, a cargo pump will be started.

Information

1. The tanker is at sea, partially loaded. The Benzene cargo requires re-circulating and, prior to arrival at the next port, the tanks prepared to receive propylene oxide need their atmospheres checking.
2. The ship will be at sea on a loaded passage with the power on only for cargo monitoring systems. Power for operating cargo pumps and valves will need to be requested and established.
3. Do not forget to monitor all other cargo and ballast spaces for anomalies.

Competence Requirements

1. State what commercial or logistic concerns may arise by having to execute this task on a loaded sea passage.
2. State who is more likely to issue instructions regarding agitation.
3. State why it is necessary to purge the cofferdam of the submerged pumps before and after their use.
4. State what actions should be taken in the event of a leak of Benzene onto the deck during the re-circulation of cargo.
5. State why Propylene Oxide need to be transported in a specified atmosphere.

Note:

The nitrogen atmospheres in the tanks due to receive propylene oxide, 5 C P & S, can be checked for pressure and oxygen content. This is best done once the re-circulation of the Benzene parcel has been started.

EXERCISE 8

First discharge, Second load port

Objectives

As a variation to previous multi-tasking exercises, operations to manage in this one include discharging, loading and de-ballasting. Do not forget the importance of check-lists and the following of cargo / ballast plans.

Information

Terminal requirements necessitate that discharging is commenced prior to the loading of any grades. The Propylene Oxide grade is to be loaded last.

The discharge of the following parcels is planned;

CTC	from	10 P & S
Potassium Hydroxide 40%	from	1 & 2 P & S
Benzene	from	3 C P & S, 4 C P & S
Acetic Acid	from	8 C P & S, 9 C P & S

Loading of the following cargoes is planned;

Toluene	into	3 P & S, 4 P & S, 5 P & S
Acetone	into	6 P, 7 P, 8 P and 9 P
Methanol	into	6 S, 7 S, 8 S and 9 S
Propylene Oxide	into	5 CP and 5 CS

The tanks loading toluene and propylene oxide will require a vapour return line. Ballasting will need to be planned in line with loading / discharge.

As before, do not forget the maximum loading rates applicable to each cargo tank.

Competence Requirements

1. State where information and advice regarding tank preparation is likely to come from.
2. State where the minimum safety criteria for the carriage of this cargo are listed.
3. State the specific carrying conditions generally required for these cargoes.
4. State the forms of contamination that the tank inspections will be investigating.
5. State what procedures should be adopted at the start of discharge to minimise the possibility of pressure surges in the lines.
6. State why it is important to incorporate flexibility into the cargo plan.
7. State why the acetone tanks might not be loaded to 98% full.
8. State the systems used for gauging of cargo tanks.
9. State what factors are taken into account when calculating cargo quantities.
10. Discuss the construction and operation of Framo pumps.
11. Describe and demonstrate the correct way to start a Framo pump.
12. Discuss the checks and procedures that should be used when starting to discharge from any tank.
13. Discuss the possibility of flow of liquid back into a tank connected to the same line.

EXERCISE 9

Mid Second port – loading, discharge & pre-wash

Objectives

This exercise is focussed on the requirement to perform a pre-wash of the tanks from which CTC has just been discharged.

Information

1. The status of the cargo tanks being worked will be such that a stagger will have been established in order that resources may be temporarily concentrated on the starting of the washing programme. This activity should in no way undermine the monitoring of other operations. You should also understand that the pre-wash needs witnessing and recording by a MARPOL cargo inspector.
2. One of the aims of the exercise is to realise the benefit of sound forward planning and efficient resource management. A number of activities will be on-going simultaneously, and the management of such forms the essence of chemical tanker operations. Whilst monitoring all additional activities, 10 P and S require a pre-wash immediately upon completion of their discharge. The duration and number of cycles of this pre-wash will be determined by consultation with the tanker's P & A manual. It is suggested that the tank washing machines are run for 40 minutes in each tank, concurrently, in order for the washing to be efficient.
3. Ensure that the above steps have been taken prior to the setting up and pre-washing of the necessary tanks. Communications with the deck watch should remain effective. Also it is good practice to advise the terminal of the commencement of tank washing. Ensure that the lines, valves and pumps are set up accordingly and that the pumps are started and pressure brought on the lines, following good practice.

Cargo is being loaded as follows:

Toluene	into	3 P & S, 4 P & S, 5 P & S
Acetone	into	6 P, 7 P, 8 P and 9 P
Methanol	into	6 S, 7 S, 8 S and 9 S
Propylene Oxide	into	5 CP and 5 CS

Discharge will continue;

Potassium Hydroxide 40%	from	1 P & S, 2 P & S
Benzene	from	3 C P & S, 4 C P & S
Acetic Acid	from	8 C P & S, 9 C P & S

The tanks from which CTC has just been discharged will require a pre-wash, so you will have to set up the tank washing line, start the tank washing pump and start the wash.

Competence Requirements

1. State what pre-planning is required to enable the pre-wash to be started without jeopardising other concurrent operations.
2. State how apparent trim difficulties, presented with the need to complete discharge of CTC from the aft cargo tanks, can first be overcome.
3. State which shore based official will need to witness the pre-wash.
4. State what the options are if such an official is not available.
5. State where the verification of the pre-wash will be recorded and how it will be verified.
6. Discuss the management of pressure within the tank washing system.
7. Discuss the various pre-wash procedures and required documentation.
8. State how you will know if the tank washing machines are functioning.
9. State the procedures you will follow once the pre-wash has been completed.

EXERCISE 10

Completion of discharge including stripping

Objectives

Manage the draining and stripping of the tanks to be discharged. This will involve good pump handling and operation of the stripping system. At the same time you are required to manage the ongoing loading operation and control the trim and list for draining and stripping of tanks. A cargo plan for this operation must be prepared before starting this operation.

Information

1. The task in this exercise will be to strip the following tanks ashore;

Potassium Hydroxide 40%	from	1 P & S, 2 P & S
Benzene	from	3 C P & S, 4 C P & S
Acetic Acid	from	8 C P & S, 9 C P & S
2. The tanks that have discharged the above cargoes need to be stripped to the maximum extent possible.
3. Loading continues in the following tanks and will need to be monitored at the same time.

Toluene	into	3 P & S, 4 P & S, 5 P & S
Acetone	into	6 P, 7 P, 8 P and 9 P
Methanol	into	6 S, 7 S, 8 S and 9 S

Competence Requirements

1. State why is it so necessary to strip the tanks dry.
2. State which sources of information can be consulted for information regarding stripping limits.
3. State what practical implications are associated with poor draining of the cargo system.
4. State what commercial implications are associated with poor draining of the cargo system.
5. State if any of these three parcels require a pre-wash.
6. State where such information can be found.
7. State how should the cargo pumps should be controlled during the draining of the tanks.
8. State what would happen if the pump controller in the cargo control room were to fail during this operation.

EXERCISE 11

Wash, ventilation and cooling

Objective

The objective of this exercise is to ventilate tanks 3 C P & S, 4 C P & S, which previously contained Benzene, and to cool the cargo of Propylene Oxide (P.O.).

Information

1. The vessel is at sea after leaving the second loading / discharge port. Empty tanks are to be cleaned ready for the next cargo. This will involve the washing of the Acetic Acid tanks. The tank washings will be transferred to 10P&S which will be nominated as slop tanks. (In the next exercise these will be decanted overboard.)
2. The cargo orders for the next loading have been received and it can be taken that the standard of washing required is 'water white'. The next cargoes will be low specification and non-aggressive.
3. The Benzene tanks are also to be cleaned. Being a volatile cargo, this can be cleaned by ventilation alone.
4. The P.O. cargo temperature has been allowed to rise to about 17°C and this is near to the upper acceptable temperature limit. The cooling system is to be run to prevent any further rise in temperature and to cool the cargo by a few degrees over the next 48 hours.

Competence Requirements

1. State which tanks are required to be washed.
2. State what sort of washing medium should be used.
3. State what sort of washing cycle should be utilised.
4. State what should be done with the tank washings (vessel is only 7 miles from the nearest land).
5. State which tanks can be used as slop tanks.
6. State how the Benzene tanks may be cleaned.
7. State what options are there are for the ventilation of these tanks (top bottom, blow or extract).
8. State what the ideal carriage temperature is for the P.O.
9. The P.O. cargo is a little above the ideal temperature. State what options are likely to be available for cooling on this ship, and on other ships.
10. State whether the fresh water cooler or the thermal oil cooler should be used.
11. State what checks should be made when cooling the cargo in this way.
12. State which checks should be made on the atmosphere in the P.O. tanks.
13. State how the atmosphere in the P.O. tanks be maintained.
14. State how these multiple operations should be controlled.
15. State which records should be kept during these operations.

EXERCISE 12

Discharge residues at sea according to MARPOL

Objective

Prepare and execute a slop disposal plan following the correct procedures in order to discharge residues, as per MARPOL and the P & A manual. Distinguish between those slops which may and those which may not be discharged at sea.

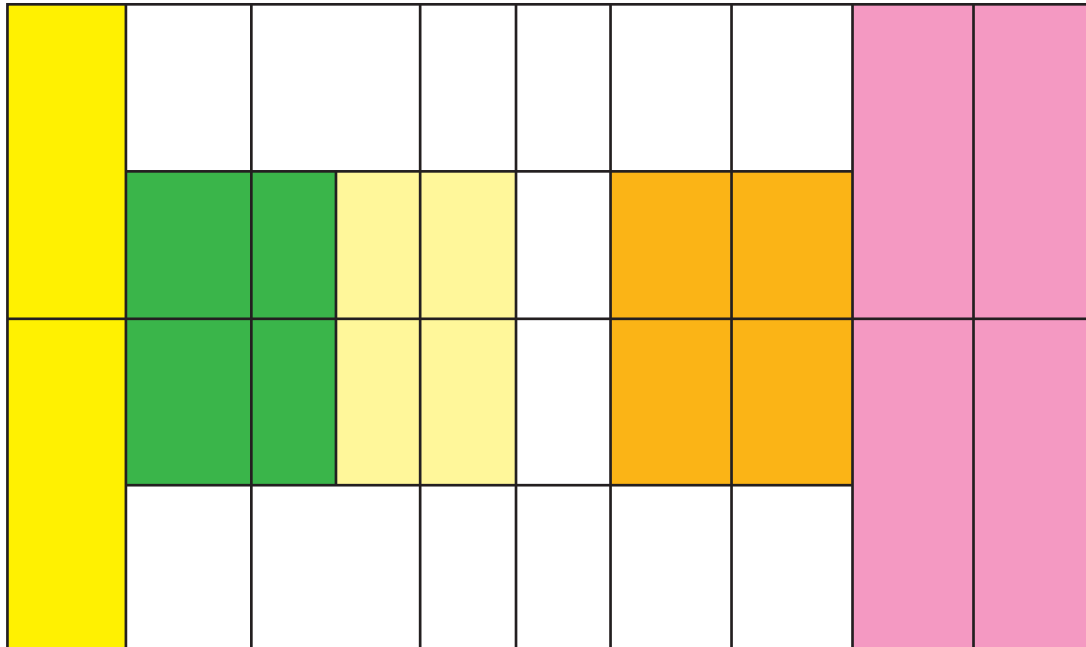
Information

1. The vessel is at sea, outside of a special area, underway at a speed in excess of 16 knots and in water of about 75 metres depth. The nearest land is about 17.5 miles away.
2. Slops are contained in 10P&S cargo tanks and are the residues of the tank washing previously carried out in the cargo tanks that contained Acetic Acid.

Competence Requirements

1. Prepare a plan for the discharge of the slops which should include planning for necessary power requirements in order to operate valves and pumps in the cargo area.
2. Ensure a record of events is maintained and the NLS Cargo Record Book is completed as required.
3. Ensure the procedures set out in the ship's P&A Manual are adhered to.
4. Ensure that good pumping practice is used when starting the operation.
5. Maintain an accurate and detailed log of events and complete the NLS Cargo Record Book as required.
6. State which checks should be made on the status of the other cargo tanks during this operation. Remember particularly the sensitivity of the P.O. cargo.

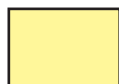
**CARGO STOWAGE PLAN
AFTER FIRST LOAD PORT**



Carbon Tetrachloride CTC



Acetic Acid



Acetonitrile



Benzene



Potassium Hydroxide 40%

CARGO STOWAGE PLAN AFTER SECOND LOAD / FIRST DISCHARGE

10	9	8	7	6	5	4	3	2	1

- Acetone
- Acetonitrile
- Propylene Oxide
- Methanol
- Toluene



INTERTANKO

INTERTANKO London

St Clare House
30-33 Minories
London EC3N 1DD
United Kingdom

Tel: +44 20 7977 7010
Fax: +44 20 7977 7011
london@intertanko.com

INTERTANKO Oslo

Nedre Vollgate 4
5th floor
PO Box 761 Sentrum
N-0106 Oslo
Norway

Tel: +47 22 12 26 40
Fax: +47 22 12 26 41
oslo@intertanko.com

INTERTANKO Asia

5 Temasek Boulevard,
#12-07 Suntec City Tower
Singapore 038985

Tel: +65 6333 4007
Fax: +65 6333 5004
singapore@intertanko.com

INTERTANKO North America

801 North Quincy Street
Suite 200
Arlington, VA 22203
USA

Tel: +1 703 373 2269
Fax: +1 703 841 0389
washington@intertanko.com