

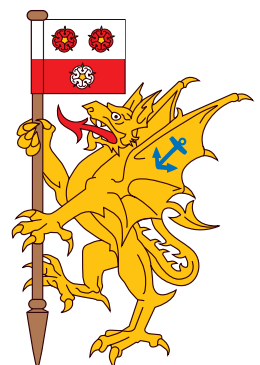
# INTERTANKO

**Tanker Officer Training Standards (TOTS)**

## **4B Chemical Tanker Simulator Verification Course**



**Poseidon**  
*Challenge*



**WARSASH**  
**MARITIME ACADEMY**



# INTERTANKO

## Tanker Officer Training Standards (TOTS)

# 4B Chemical Tanker Simulator Verification Course

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# Tanker Officer Training Standards (TOTS)

## 4B Chemical Tanker Simulator Verification Course

### Prerequisites

These simulator assessments have been designed to take place at the end of the Tanker Officer Training Scheme. Therefore it is expected that candidates will have had considerable experience of the operations simulated here. They will need this experience in order to be prepared for the following assessment.

Competence Demonstration S Simulated  
Q Questioning

### TOTS Reference

TOTS 4B

### Competence

Verification in chemical tanker operations

### Simulator Exercises

- Exercise 1.** Cargo tank preparation
- Exercise 2.** Commence loading
- Exercise 3.** Multiple operations, continue loading, load into further tanks, de-ballasting
- Exercise 4.** Multiple operations, topping off, loading, de-ballasting
- Exercise 5.** Loaded voyage, agitation and tank preparation
- Exercise 6.** Commence simultaneous load and discharge
- Exercise 7.** Pre-wash 10 P & S on completion of discharge
- Exercise 8.** Complete discharge and stripping
- Exercise 9.** Tank washing, ventilation and cargo cooling
- Exercise 10.** Decant permissible washings to sea
- 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.

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 sub-divided into centre and wing spaces. Each tank has its own pump, vent line and manifold. There are two 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 programme.

## EXERCISE 1

### Cargo Tank Preparation

#### Current Status

The vessel is currently at sea on the ballast voyage having recently left drydock. Most cargo tanks have been prepared for loading, however the following tanks require washing with hot fresh water, 6CP&S, 7CP&S, 1P&S, 2P&S. Fresh water may be drawn from the fore and after peak tanks.

Cargo tanks 5CP&S need to be inerted with nitrogen.

For operational reasons 6&7CP&S are to be washed before 1&2P&S.

The tank washing cycle is to include a top wash of 20 minutes followed by a bottom wash of 20 minutes for each tank.

The P&A manual states that only a maximum of 8 washing machines can be used at one time in order to maintain a suitable washing pressure.

Washing line is to be pressure tested to 10bar before washing commences.

Since there are no cargo residues onboard (the vessel has come from drydock) tank washings are not covered by MARPOL and are considered clean enough to be discharged directly overboard.

Nitrogen inerting of 5CP&S is to be started during the water washing of tanks at a suitable time.

#### Competence Criteria

#### Competence Demonstration

Explain when the cargo system needs to be inerted to receive cargoes:

Q

- at what stage of the cargo cycle
- factors determining whether the system needs inerting

Explain the significance of the quality of nitrogen supplied to the cargo system:

Q

- required quality in terms of nitrogen and oxygen content
- required dewpoint

Explain the function of the nitrogen generator:

Q

- suggest two features nitrogen has that protect the cargo

Demonstrate the operation of the nitrogen generator:

S

- open and start relevant components of nitrogen system in correct sequence

Demonstrate the correct use of an oxygen analyser to determine oxygen concentration at various positions within the cargo system:

S

- operate oxygen analyser correctly and interpret readings in context

Demonstrate the correct management of tank cleaning operations:	Q
<ul style="list-style-type: none"> <li>Identify which cargo tanks require cleaning and establish appropriate cleaning and preparation methods</li> </ul>	
Demonstrate an understanding of tank cleaning procedures:	Q
<ul style="list-style-type: none"> <li>recognise the various sources of tank cleaning instructions</li> <li>give examples of alternative sources</li> </ul>	
Demonstrate control of line pressure indicating an understanding of the need to reduce pressure in a line prior to opening valves:	S
<ul style="list-style-type: none"> <li>set up lines for tank washing</li> </ul>	S
<ul style="list-style-type: none"> <li>bring power onto washing line system controlling valves and line pressure appropriately</li> </ul>	S
<ul style="list-style-type: none"> <li>repeat line pressure control when changing tanks</li> </ul>	S
Demonstrate the correct settings for the tank washing cycles:	S
<ul style="list-style-type: none"> <li>consult operating manual or alternative appropriate advice for machine setting</li> </ul>	
Explain why tank cleaning procedures vary so much on chemical tankers:	Q
<ul style="list-style-type: none"> <li>which factors cause the vast array of options?</li> </ul>	
Describe routine checks on cargo tanks previously inerted:	Q
<ul style="list-style-type: none"> <li>why is it important to monitor the atmosphere in cargo tanks which are not currently being worked?</li> </ul>	
Keep an accurate and complete log of relevant events.	S

## EXERCISE 2

### Commencing Loading

#### Current Status

The vessel is securely moored port side alongside. The ship shore checklist has been completed.

The vessel will be loading the following grades at this first load port:

1 P & S and 2 P & S	Sodium Hydrosulphide Solution 45%
3 C P & S and 4 P & S	Phenol
6 C P & S and 7 C P & S	Propionitrile
8 C P & S and 9 C P & S	Hexanoic Acid
10 P & S	Dioctyl Phthalate

Of these grades, Sodium Hydrosulphide Solution 45%, Propionitrile, and Dioctyl Phthalate will be started first. Phenol and Hexanoic Acid will be started approximately two hours after the loading of the first three grades at the terminal request.

Bear in mind the agreed maximum loading rates for each tank in relation to its venting capabilities.

Prior to starting the exercise you are required to produce a de-ballasting plan to accommodate the loading of these grades.

You should agree with the terminal the sampling procedures to be followed for each grade.

#### Competence Criteria

#### Competence Demonstration

Demonstrate the methods and procedures necessary to safely prepare and commence a loading operation:

- test the various required alarms, including high level and overflow alarms and pump trips Q
- test the communication systems between the relevant parties S
- complete the ship / shore checklist S
- With whom should this checklist be completed? Q

Determine which cargoes, if any, will require vapour return lines:

- check data sheets and / or charterer / shipper instructions S

Explain how tanks will be verified as having been prepared adequately for loading to commence:

- What can the ship's staff conduct to indicate a tank's cleanliness? Q
- What can the ship's staff do if these indications are not appropriate? Q
- What will 'independent' cargo surveyors conduct for the same purpose? Q
- If the 'independent' surveyor does not pass a cargo tank for loading, what happens? Q

Once loading has commenced, what additional cargo quality check may be employed by the cargo surveyor? Q

- Describe the type of rate at which loading should commence Q
- Explain what should be taken into account when determining this initial loading rate. Q
- Explain what ships' staff need to ensure during this additional check, if necessary. Q

If the aforementioned additional check is not required, describe at which point the loading rate may be increased. S

Once this final verification has been completed and loading resumes, demonstrate how to establish and maintain the agreed and appropriate loading rate: S

- Explain where such details for this tanker would be recorded Q

Keep an accurate and complete log of relevant events.

## EXERCISE 3

### Multiple operations – continue loading, load into further tanks, de-ballasting

#### Current status:

The vessel has already started to load the following cargo;

1 P & S and 2 P & S	Sodium Hydrosulphide Solution 45%
6 C P & S and 7 C P & S	Propionitrile
10 P & S	Dioctyl Phthalate

This exercise will involve the continued loading of the above cargoes and the commencement of the following;

3 C P & S and 4 P & S	Phenol
8 C P 7 S and 9 C P & S	Hexanoic Acid

The Phenol parcel will be loaded into tanks connected to a vapour recovery manifold.

You will have made a de-ballasting plan in order to counteract the stability implications and stresses imposed by the movement of these parcels.

#### Competence Criteria

The student should be familiar with the management of multiple simultaneous operations. This will incorporate monitoring tanks at different stages of loading and de-ballasting.

Commence loading in further tanks and by demonstration:

- repeat preparation and monitoring of further tanks being loaded S
- continue to monitor all other cargo tanks. S
- explain why this is necessary. Q
- Explain what specifically requires monitoring in other tanks. Q
- Explain what the cause of any anomaly could be. Q
- Explain examples of causes of concern in this context. Q
- Explain how you could utilise the resources at your disposal to assist with this monitoring. Q
- Explain under which conditions you would you allow further tanks to be loaded. Q
- Demonstrate under which conditions you would commence de-ballasting operations. S
- Demonstrate what else, other than cargo and ballast tanks, you would monitor during cargo and ballast transfer. S
- Demonstrate with whom would you require channels of communication during such an activity. S
- Explain which legislation governs atmospheric emissions from tankers. Q

Keep an accurate and complete log of relevant events.

#### Competence Demonstration

## EXERCISE 4

### Multiple operations – topping off, loading and de-ballasting.

Manage a topping off operation, whilst continuing to load other tanks and de-ballast.

#### Current status:

The tanker is currently loading five different parcels into 18 tanks. Three of the parcels in 10 tanks are about to be topped off. Loading of a further two cargoes into 8 tanks continues, with the Phenol parcel requiring vapour recovery.

De-ballasting will also continue.

The following tanks will be topped off during this exercise;

1 P & S and 2 P & S	Sodium Hydrosulphide Solution 45%
6 C P & S and 7 C P & S	Propionitrile
10 P & S	Dioctyl Phthalate

Loading will continue into;

3 C P & S and 4 P & S	Phenol
8 C P 7 S and 9 C P & S	Hexanoic Acid

#### Competence Criteria

Top off relevant cargo tanks whilst continuing to load other tanks and continuing to de-ballast:

- Demonstrate how you will prepare to conduct these operations simultaneously. S
- Explain what specific precautions you will take with regard to topping off. Q
- Explain what additional checks you will you make specifically prior to topping off. Q
- Explain the benefits of establishing a logical sequence of tanks to be topped off. Q
- Explain the significance of controlling the list and trim at this stage. Q
- Demonstrate the controlling loading rates prior to and during the topping off procedure. S
- Explain the danger associated with closing a tank valve against the flow of oil from ashore. Q
- Explain the respective benefits and disadvantages of a 'ship stop' and a 'shore stop'. Q
- Explain how cargo will be cleared from the shore line upon completion of topping off. Q
- Describe hazards commonly associated with line clearing. Q
- How can these problems be avoided. Q

Keep an accurate and complete log of relevant events.

#### Competence Demonstration

## EXERCISE 5

### Loaded voyage – agitation and tank preparation

#### Current Status:

The vessel is at sea, partially loaded. The Phenol cargo requires re-circulating and, prior to arrival at the next port, the tanks prepared to receive Isophorone Diisocyanate need their atmospheres checking.

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.

#### Competence Criteria

#### Competence Demonstration

Explain and demonstrate the requirement and method of 'agitating' a cargo:

- Explain who is most likely to issue instruction on agitation. Q
- Explain the purpose of agitating or re-circulating a cargo on a loaded passage. Q
- Demonstrate that power is available to work the cargo pumps on the required tanks. S
- Demonstrate selection of the tanks whose cargo require re-circulation. S
- Demonstrate which valves and lines to set in order to re-circulate the Phenol parcel. S
- Demonstrate routine maintenance checks that are carried out on cargo pumps before and after use. S
- Explain what actions should be taken in the event of a leak of Phenol onto the deck during the re-circulation of cargo. Q

Demonstrate the principles of hydraulic pump operation;

- Demonstrate correct pump starting procedure. S
- Demonstrate safe pumping practice. S
- Demonstrate an adequate monitoring of tanks and ensure no cargo vapour escapes into the atmosphere other than through the designed venting arrangements.
- Demonstrate the deck lines to be drained back into the cargo tanks. S
- Upon completion of this task re-check by demonstration that the atmosphere in 5 C P & S is suitable for the loading of Isophorone Diisocyanate. S
- Explain why the tank atmosphere in the tanks carrying Isophorone Diisocyanate requires monitoring. Q
- Explain where safety information, regarding these cargoes would be available. Q

Keep an accurate and complete log of relevant events.

## EXERCISE 6

### Commence simultaneous load and discharge

#### Current Status:

The vessel is all fast alongside, port side alongside awaiting the outcome of the tank inspection and pre-cargo meeting. Due to terminal requirements the discharging of all four grades is to be commenced before any loading is started. You are required to plan the order in which the grades are discharged. All grades are to be completely discharged.

The discharge of the following parcels is planned for this port:

Diocetyl Phthalate	from	10 P & S
Sodium Hydrosulphide Solution 45%	from	1 & 2 P & S
Phenol	from	3 C P & S, 4 C P & S
Hexanoic Acid	from	8 C P & S, 9 C P & S

Once discharge of the above grades is underway you must commence the loading of the following three grades.

Loading of the following cargoes is planned:

Propylbenzene	into	3 P & S, 4 P & S, 5 P & S
Diethylene Glycol	into	6 P, 7 P, 8 P and 9 P
Cyclohexanol	into	6 S, 7 S, 8 S and 9 S

A parcel of Isophorone Diisocyanate is also to be loaded at this port. However due to problems within the terminal the loading of this parcel is not to start until the loading of the other 3 grades has been completed.

Isophorone Diisocyanate	into	5 CP and 5 CS
-------------------------	------	---------------

The tanks loading Propylbenzene and Isophorone Diisocyanate will require a vapour return line. De-ballasting will need to be planned in line with loading / discharge.

#### Competence Criteria

Demonstrate management of multiple concurrent operations including loading, discharging and de-ballasting.

- Demonstrate that cargo plan has been followed. S
- Demonstrate completion of the standard checklists prior to commencing cargo operations. S
- Explain which tanks require an inspection and which do not. Q
- Explain which tanks require a wall wash test. Q
- Describe the entry requirements into the tanks to be inspected. Q
- Demonstrate effective communication with the Jetty Operator, deck watch and any other relevant parties. S
- Describe the operation of Framo pumps. Q
- Demonstrate the correct way to start a Framo pump. S
- Demonstrate the correct way to start discharge from a tank. S

#### Competence Demonstration

- Describe the checks to be made at the start of discharging a tank. Q
- Describe the danger of overflowing tanks connected to the same line when starting to discharge. Q
- Explain where information and advice regarding tank preparation is likely to come from. Q
- Describe where the minimum safety criteria for the carriage of this cargo are listed. Q
- Explain what specific carrying conditions are generally required for these cargoes. Q
- Explain what forms of contamination the tank inspections would be investigating. Q
- Describe what procedures should be adopted at the start of discharge to minimise the possibility of pressure surges in the lines. S
- Explain why is it important to incorporate flexibility into the cargo plan. Q
- Explain why the Diethylene Glycol tanks might not be loaded to 98% full. Q
- Explain what factors may impact on the manifold back-pressures indicated. Q
- Describe what factors could affect the overall efficiency of the operation. Q
- Explain, other than for safety, why efficient performance is important. Q
- Explain which parcel will require its tanks pre-washing as soon as it has been discharged. Q
- Demonstrate how, once cargo operations are underway, ballast can be worked to the advantage of the cargo operations. S

Keep an accurate log of events.

## EXERCISE 7

Pre-wash 10 p and 10 s upon completion of discharge of the DIOCTYL PHTHALATE

### Current Status:

Concurrently with both loading and discharge, the pre-wash of 10 P and S must be undertaken.

Loading continues;

Propylbenzene	into	3 P & S, 4 P & S, 5 P & S
Diethylene Glycol	into	6 P, 7 P, 8 P and 9 P
Cyclohexanol	into	6 S, 7 S, 8 S and 9 S

Discharge is also being undertaken;

Sodium Hydrosulphide Solution 45%	from	1 P & S, 2 P & S
Phenol	from	3 C P & S, 4 C P & S
Hexanoic Acid	from	8 C P & S, 9 C P & S

### Competence Criteria

Understand the requirement of and perform a pre-wash of the tanks from which Dioctyl Phthalate has just been discharged.

Understand the benefit of planning ahead, in order to make best use of the time available, the best use of resources and the benefit of sequencing.

- Which sources of information need to be consulted, when planning this pre-wash.
- Identify the correct washing medium
- Complete a pre-washing checklist

Demonstrate management of loading, discharging, tank washing and ballasting simultaneously.

- Explain which publication needs consultation, giving the technical requirements of the pre-wash.
- Describe the various pre-wash requirements and procedures.
- Explain which individual is required to witness the pre-wash, as indicated above.
- Explain what the alternative options are, if such an official is not available.
- Explain, other than following the procedures detailed in the publication identified above, which other source of information will indicate the concentration of cargo residue in the washings being stripped ashore.
- Explain which check will confirm that the residues of the pre-wash being pumped ashore indicate that the tanks are clean.
- Explain where the details of this pre-wash will be recorded.

### Competence Demonstration

S

Q

Q

S

Q

Q

Q

Q

Q

Q

Q

- Explain what will be required on the tank washing system, once washing has been completed. S
- Demonstrate the pre-planning that is required to enable the pre-wash to be started without jeopardising other concurrent operations. S
- Demonstrate how the apparent trim difficulties arising from with the need to complete discharge of Dioctyl Phthalate from the aft cargo tanks first can be overcome. S
- Demonstrate where the verification of the pre-wash will be recorded and how it will be verified. S
- Explain how you will know if the tank washing machines are functioning. Q
- Explain why it is so necessary to strip the tanks dry. Q
- Describe which sources of information can be consulted for information regarding stripping limits. Q
- Describe the practical implications associated with the poor draining of the cargo system. Q
- Describe the commercial implications associated with the poor draining of the cargo system. Q
- Explain how the pump is stripped of cargo. Q
- Describe how the pump can be controlled in the event of a failure of the control system in cargo control room. Q

## EXERCISE 8

### Complete the discharge, stripping the requisite tanks

#### Current Status

Discharging and loading continue. Twelve cargo tanks are nearing the end of discharge and will need to be drained and stripped. The cargo pumps will also need to be stripped on completion.

Ballast is currently being taken on board.

Do not neglect other operations such as the loading of cargo elsewhere. It will be important to maintain effective communications with the deck watch and with the terminal, to ensure that cargo is being stripped ashore as intended.

You will be required to produce a plan for this part of the operation.

#### Competence Criteria

Control the pumps during draining of the tanks and complete stripping of tanks pumps and lines.

Demonstrate pump control during the draining of tanks:

- Demonstrate the stripping of cargo tanks and pumps using the appropriate stripping methods. S
- Demonstrate management of resources and communications to expedite the completion of discharge. S
- Demonstrate monitoring of all the tanks being loaded and discharged. S
- Demonstrate control of the vessel's trim to provide adequate tank draining. S
- Demonstrate keeping the terminal informed of the progress of the discharge. S
- Demonstrate the completion of the documented procedures in order to satisfy both regulatory and commercial requirements. S
- State whether any of these three parcels require a pre-wash. Q
- Explain which source of information will indicate which parcels require this. Q
- Explain what should happen to the pump directly after stripping is completed. Q
- Explain why purging the pump cofferdam is so important with this type of pump. Q
- Describe what purging records should be kept. Q
- Explain how changing the sequence of stripping can be an advantage. Q
- Describe in what ways the operation could have been better planned. Q

Keep an accurate record of events and ensure the NLS cargo record book has been updated.

#### Competence Demonstration

## EXERCISE 9

### Tank washing, ventilation and cargo cooling while at sea.

#### Current Status

The vessel is at sea sailing at around 16 knots, approximately 7 miles from the nearest land. 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.

The tanks that contained Hexanoic Acid are to be washed.

The tanks which contained Phenol are to be cleaned.

The Isophorone Diisocyanate cargo temperature has been allowed to rise to about 17°C, which 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 Criteria

Ventilate tanks 3 C P & S, 4 C P & S, which previously contained Phenol, in order to cool the cargo of Isophorone Diisocyanate

- Explain the appropriate tank cleaning procedures related to the nature of the cargo residue remaining. Q
- Explain which cargo tanks may be cleaned by ventilation alone. Q
- Explain which operations need recording in the NLS Cargo Record Book. Q
- Describe which publications to consult in order to plan the washing programme. Q

Demonstrate an understanding of which factors will influence the washing programme:

- Explain what might influence the efficiency of the tank washing, cleaning and preparation operation. Q

Demonstrate an understanding of the recommended procedures for maintaining the temperature and quality of the Isophorone Diisocyanate cargo parcel:

- Explain how the efficiency of temperature control be assessed. Q
- Demonstrate the correct way to start the cooling system. S
- Demonstrate the re-circulation of cargo through a heat exchanger in order to cool a cargo. S
- Demonstrate how to control the flow rates and pressures in a heat exchanger in order to minimise the possibility of cargo contamination in the event of a leak within the heat exchanger. S
- Explain which tanks are to be washed. Q

#### Competence Demonstration

- Explain what sort of washing medium should be used. Q
- Demonstrate the washing cycle that should be utilised. S
- Explain how the tank washings are dealt with. (vessel is only 7 miles from the nearest land). S
- Demonstrate which tanks can be used as slop tanks. S
- Demonstrate how the Phenol tanks can be cleaned. S
- Describe what options there are for ventilating these tanks (top bottom, blow or extract). Q
- Explain what is the ideal carriage temperature is for the Isophorone Diisocyanate. Q
- Explain what options are likely to be available for cooling on this ship if the Isophorone Diisocyanate cargo is a little above the ideal temperature.
- Explain if the fresh water cooler or thermal oil cooler should be used. Q
- Explain what checks should be made when cooling the cargo in this way. Q
- State whether the pressure of the, coolant in the heat exchanger should be higher or lower than the pressure of the cargo.
- Explain how the pressures in the heat exchanger should be controlled in order to reduce the possibility of cargo contamination if there is a leak within the heat exchanger. Q
- Explain which checks should be made on the atmosphere in the Isophorone Diisocyanate tanks. S
- Explain how the atmosphere in the Isophorone Diisocyanate tanks can be maintained. Q
- Describe which records should be kept during these operations. Q

## EXERCISE 10

### Decant permissible tank washings at sea

#### Current Status

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.

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 Hexanoic Acid.

#### Competence Criteria

- Explain which slops may and which may not be discharged at sea.
- Describe the areas where slops may or may not be discharged.
- Explain how the discharge of slops is kept within the parameters set out in MARPOL Annex II.
- Explain how the details of the P & A manual are followed in order to comply with the provisions of MARPOL.

Set up the deck for discharge of the slops, through the appropriate piping arrangements:

- Describe the preparation of a slop disposal plan.
- Demonstrate the management of a slop disposal plan.
- Set up the deck lines for discharge of the appropriate slops, through the over-board discharge facility, into the sea.
- State whether the residues of the cargoes may be mixed in the same slop tank.
- Explain which checks should be made on the status of the other cargo tanks during this operation.

Maintain an accurate and detailed log of events.

#### Competence Demonstration

Q

Q

Q

Q

S

S

S

Q

Q

**CARGO STOWAGE PLAN  
AFTER FIRST LOAD PORT**

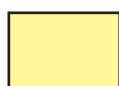
Yellow								Pink	Pink
	Green	Green	Yellow	Yellow		Orange	Orange		
Yellow	Green	Green	Yellow	Yellow		Orange	Orange	Pink	Pink



Diocetyl Phthalate



Hexanoic Acid



Propionitrile


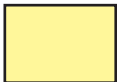





Phenol



Sodium Hydrosulphide Solution 40%

**CARGO STOWAGE PLAN**  
AFTER SECOND LOAD / FIRST DISCHARGE


-  Diethylene Glycol
-  Propionitrile
-  Isophorone Diisocyanate
-  Cyclohexanol
-  Propylbenzene



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